

## **AGGREGATES, CEMENT AND READY-MIX CONCRETE MARKET INVESTIGATION**

### **Provisional findings report**

Notified: 21 May 2013

The Competition Commission has excluded from this published version of the provisional findings report information which the inquiry group considers should be excluded having regard to the three considerations set out in section 244 of the Enterprise Act 2002 (specified information: considerations relevant to disclosure). The omissions are indicated by [✂]. Some numbers have been replaced by a range. These are shown in square brackets. Non-sensitive wording is also indicated in square brackets.

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# Summary

## The reference

1. On 18 January 2012, the Office of Fair Trading (OFT) referred the supply or acquisition of aggregates, cement and ready-mix concrete (RMX) in Great Britain (GB) to the Competition Commission (CC) for investigation. The reference was made under sections 131 and 133 of the Enterprise Act 2002 (the Act).
2. We are required to decide whether ‘any feature, or combination of features, of each relevant market prevents, restricts or distorts competition in connection with the supply or acquisition of any goods or services in the United Kingdom or a part of the United Kingdom’.<sup>1</sup> If the CC decides that there is such a feature or combination of features, then there is an adverse effect on competition (AEC).<sup>2</sup> This report sets out our provisional findings based on the evidence we have reviewed and the analysis we have carried out to date. We are required to publish our final report by 17 January 2014.

## Provisional findings

3. We did not identify any features giving rise to an AEC in any market in GB for the supply of aggregates or RMX.
4. We found that there was a combination of structural and conduct features that gave rise to an AEC in the GB cement markets through coordination.
5. We also found that one Major’s exclusive agreements with the GB steel producers for the production of granulated blast furnace slag (GBS), and another Major’s exclusive long-term contract with the GBS-producing Major for the purchase of GBS to produce

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<sup>1</sup> Section 134(1) of the Act.

<sup>2</sup> Section 134(2) of the Act.

ground granulated blast furnace slag (GGBS—which can be used as a partial substitute for cement), in combination with both these Majors' participation in the GB cement markets, were further features that gave rise to an AEC in the GB cement markets.

6. The likely effect of these features is higher prices of cement in GB than would otherwise be the case for all GB cement users, whether this cement is ultimately sold through independent RMX and concrete producers, independent merchants or through the downstream businesses of the five largest heavy building materials producers in GB (the Majors).

### **The reference products**

7. Aggregates are the granular base materials used in the construction of roads, buildings and other infrastructure. Aggregates may be divided into:
  - (a) primary aggregates, which are extracted from quarries, pits and (in the case of marine aggregates) the seabed;
  - (b) secondary aggregates, which are by-products of industrial and mining processes; and
  - (c) recycled aggregates, which are produced, for example, from demolition sites and construction waste.
  
8. Cement is the 'glue' that binds together the components of building materials. Among other uses, cement is mixed with aggregates and water to produce RMX and concrete products (for example, concrete blocks). Cement is made from a mixture of finely ground limestone or chalk (or other materials with a high calcium content), clay and sand (or other sources of silica and alumina), which is heated almost to melting point, creating an intermediate product, cement clinker. The finished cement is

produced by grinding together cement clinker with additives to produce a fine powder. Cement is supplied in bulk or in bags.

9. Different types of cement are produced by blending ground clinker with other materials including GGBS and pulverized fly ash (PFA), a by-product of coal-fired power stations. We refer to these other materials collectively as 'cementitious products'. CEM I (containing less than 5 per cent additives) is the basic, and the most widely produced, cement in Great Britain. CEM II (typically made with PFA) and CEM III (made with GGBS) are the other two main types of cement supplied in the UK.
10. RMX is concrete that is produced in a freshly mixed and unhardened state. RMX is manufactured from cement, aggregates, water and other additives as necessary. RMX can be produced (a) in a fixed plant and distributed to site by a concrete mixer; (b) in a mobile plant at (or near) the customer site (also known as a 'site plant'); or (c) in a volumetric truck which carries the ingredients separately and mixes them on-site (also known as 'on-site batching'). In the UK, most RMX is mixed at a fixed plant then delivered to the customer's site.

### **Background to the reference**

11. In recent years, there have been some significant developments in these markets, which we have taken into account in our investigation.
12. GB demand for aggregates, cement and RMX declined by about a third over the period 2007 to 2009, coinciding with the UK recession, and has still not recovered to its pre-recession levels.
13. On 10 December 2010, the European Commission Directorate General for Competition (DG COMP) announced that it had opened an investigation into sus-

pected anti-competitive practices by several manufacturers of cement and related products in various European countries including the UK, involving possible infringements of Article 101(1) of the Treaty on the Functioning of the European Union (TFEU).<sup>3</sup> The DG COMP investigation remained open during our market investigation. It has not prevented us conducting a full investigation of features which may adversely affect competition in the markets referred to us. The nature and purpose of our investigation are different from those of the investigation being carried out by DG COMP.

14. On 18 February 2011, Lafarge S.A. (Lafarge Group) and Anglo American plc (Anglo American) announced a proposed joint venture (JV) of their UK construction materials businesses (the Anglo–Lafarge JV), including their aggregates, cement, RMX, asphalt and contracting operations, in which each would take a 50 per cent stake.
15. Following the reference of the Anglo–Lafarge JV to the CC by the OFT, the CC concluded in May 2012 that the proposed JV might be expected to result in a ‘substantial lessening of competition’ leading to prices that would be higher than might otherwise be the case in relation to various cement, aggregates and RMX markets in the UK.
16. The CC therefore required Anglo American and Lafarge Group to divest various cement, aggregates, RMX and asphalt assets as a condition for allowing the Anglo–Lafarge JV to proceed. The majority of these divestitures were implemented in January 2013 when Anglo American and Lafarge Group sold a package of cement, RMX, aggregates and asphalt operations to Mittal Investments Sarl, thereby creating

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<sup>3</sup> [http://europa.eu/rapid/press-release\\_IP-10-1696\\_en.htm?locale=en](http://europa.eu/rapid/press-release_IP-10-1696_en.htm?locale=en).

Hope Construction Materials (HCM). On the same day, Anglo American and Lafarge Group completed their JV, creating a new entity called Lafarge Tarmac.

### **The Majors and vertical integration**

17. In this report, we use the term ‘the Majors’ to refer to the five largest heavy building materials producers in GB. Before 2013, these companies were (in alphabetical order): Aggregate Industries UK Limited (Aggregate Industries), Cemex UK Operations Limited (Cemex), the UK construction and building materials businesses of Hanson and HeidelbergCement AG (Hanson), Lafarge Aggregates Limited and Lafarge Cement UK Limited (together Lafarge) and the UK and international operations of Anglo American’s construction and building materials arm (Tarmac). After January 2013, these companies are (in alphabetical order): Aggregate Industries, Cemex, Hanson, HCM and Lafarge Tarmac. There are also a number of what we term ‘medium-tier independents’ who produce aggregates and/or RMX in GB, or import cement.
18. All the Majors with the exception of HCM have significant aggregates operations in GB. All the Majors with the exception of Aggregate Industries produce cement in GB, and there are no other cement producers in GB. All the Majors have significant RMX operations in GB.
19. There is considerable vertical integration in the industry, and this has increased over recent years. Significant proportions of the cement and aggregates produced by each Major are used in its own downstream operations. However, each Major’s downstream operations are not completely self-supplied: cement and aggregates are also purchased externally.

## The relevant markets

20. In defining the relevant markets in which to undertake our competitive assessment, we focused on the extent of substitution between different products and how this might vary by customer, location or application.
21. We concluded that the appropriate market definitions for the purposes of our investigation were:
- (a) A single relevant product market for all construction aggregates,<sup>4</sup> including crushed rock and sand and gravel aggregates as well as recycled and secondary aggregates (although the extent of substitutability of recycled and secondary aggregates for primary aggregates varied significantly by application). We found that the geographic scope of aggregates markets was local in nature, with the precise geographic specification varying according to a variety of local factors.<sup>5</sup>
  - (b) A single relevant product market for bulk grey cement including different types of cement (ie CEM I, CEM II, CEM III etc) and imported and GB-produced cement. We also took into account the role played by GGBS and PFA in the market for grey cement. In terms of geographic scope, we focused primarily on competition at a GB level, taking into account the constraints from imported cement as part of our competitive assessment. We defined bagged cement as a separate product market due to the lack of demand-side substitutability between bulk and bagged cement.
  - (c) A single relevant product market including all specifications of RMX as well as RMX supplied from fixed plants and site plants and concrete supplied from volumetric trucks. We found that RMX markets were highly localized in nature, with narrow catchment areas within about 8 to 10 miles of RMX plants, albeit with

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<sup>4</sup> As well as construction aggregates, there are specialist aggregates used for certain specialist applications (for example, high purity limestone used for its chemical characteristics). We did not receive any specific submissions regarding competition issues in the markets for specialist aggregates, nor did we become aware of any such concerns during the course of our information gathering and analysis for this investigation more broadly. While we did not find evidence in this market investigation of features giving rise to an AEC in any such market, we make no finding as to whether or not there are competition problems in particular specialist aggregates markets.

<sup>5</sup> We analysed catchment areas for aggregates in our competitive assessment of aggregates markets.

some scope for variation in catchment area according to local factors and the means of distribution (since RMX is a perishable product and can only be transported for a limited time after it has been mixed).

## **Theories of harm**

22. We investigated different ways in which competition could be harmed (also known as ‘theories of harm’) in relation to each of the relevant markets and used these to structure our investigation:

- (a) Unilateral market power. Individual suppliers may have market power within relevant markets as a result of market concentration and barriers to entry. Such suppliers may have the ability to set higher prices than would otherwise be the case, or reduce the quality of other aspects of their offer, as a result of limited competition from other suppliers, and limited threat of entry or expansion into the market by other suppliers. We included within our assessment of this theory of harm the effect on competition in the relevant markets of the arrangements for the supply of GGBS and PFA in GB.
- (b) Coordination. Coordination between suppliers may distort or restrict competition. This may arise because suppliers are aware and take into account that competition with rivals (for example, to undercut their prices in order to win more business) will lead to competitive responses by rivals, with the result that their profits will ultimately be lower than if they avoided or limited competition. The result of coordinated behaviour may be that prices are higher (or the quality aspects of firms’ offers are lower) than would otherwise be the case.
- (c) Vertical integration and exclusionary behaviour. We examined several different hypotheses under this heading. One is that vertical integration may itself affect suppliers’ costs so that non-integrated suppliers are unlikely to be able to compete effectively with integrated suppliers. Another hypothesis is that one integrated supplier (acting unilaterally) may be raising the price of cement (and/or

aggregates) relative to the prices of RMX, with the effect of squeezing the margins of non-integrated RMX suppliers, such that non-integrated suppliers are weakened or excluded from the market. A variant on this hypothesis is that several integrated suppliers (acting collectively) may be squeezing the margins of non-integrated RMX suppliers.

(d) Aspects of policy and regulation may have the effect of preventing, restricting or distorting competition.

## **Aggregates**

23. As geographic markets for construction aggregates are local, the ability of firms to exercise unilateral market power or to coordinate is likely to vary depending on the competitive conditions in different local areas, for example the level of concentration. Therefore, much of our competitive assessment of GB aggregates markets focused on understanding the geographical scope of local aggregates markets, the identity of suppliers and level of concentration in these markets, and on comparing outcomes across local markets to analyse whether there were any widespread features of the GB aggregates markets that gave rise to one or more AECs through the exercise of unilateral market power or coordination.
24. In undertaking our competitive assessment of construction aggregates markets in GB, we examined aspects of market structure, market outcomes and conduct, as well as analysing the impact of recent market developments. While we noted that the Majors collectively supplied the majority of construction aggregates in GB, we also found that in 2011 there were over 200 non-Major aggregates suppliers in GB.
25. In relation to unilateral market power in GB construction aggregates markets, our analysis indicated that:

- (a) There were significant barriers to entry into local aggregates markets through the supply of primary aggregates due (in the case of land-won primary aggregates) to the time required to identify and acquire a suitable site and to obtain planning permission and (in the case of marine aggregates) to licensing requirements. However, we found that there were fewer barriers to the expansion of existing aggregates operations, and to entry through the supply of recycled and secondary aggregates.
- (b) Most customers had a choice of several different aggregates suppliers, and the extent of high concentration in local markets was limited.
- (c) According to our price-concentration analysis (PCA)<sup>6</sup> and entry and exit analysis<sup>7</sup> (E&EA), when customers had a wider choice of aggregates supplier (including suppliers of recycled aggregates), this did not clearly lead to lower prices. However, we noted that our PCA and E&EA produced average results across GB, and might hide local or regional variability in competitive constraints.
- (d) The Majors' returns on capital employed in their aggregates operations had been low to modest over the last five years (albeit on a GB-wide basis), with the exception of one company which appeared to have had significantly higher returns than the others.
- (e) For each Major, aggregates margins (at divisional level) had been gradually falling over the period 2007 to 2011—with price increases being outpaced by growth in variable costs. Our analysis of the medium-tier non-Major aggregates producers showed volatility and significant variation in margin levels over the period 2007 to 2011.

26. We carried out telephone interviews of aggregates customers and non-Major aggregates suppliers that were active in two case study areas of GB: South Wales and the

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<sup>6</sup> PCA uses econometric techniques to examine the relationship (if any) between the price for a good in an area and the strength of competition to supply that good in that area.

<sup>7</sup> An E&EA uses econometric techniques to examine how prices may change with the entry or exit of a competitor in a local area.

west of East Anglia. We also carried out a review of documents that we obtained from the Majors in relation to their operations in these areas. These two case study areas were both characterized by relatively high levels of concentration in terms of shares of supply by the Major aggregate producers. The case study interviews suggested that the presence of independent aggregates producers generated downward pricing pressure and that consolidation of aggregates producers had diminished this local competition. However, taken as a whole, the case study documents and the case study interviews did not appear to suggest that unilateral market power was a problem in either of the two case study areas.

27. We noted that there were some aspects of the supply of construction aggregates in GB that might make at least some local markets susceptible to coordination. These included the high market shares held by the Majors in some local markets, product homogeneity, barriers to entry into the production of primary aggregates, structural links between firms and price announcement behaviour (although any patterns in this behaviour were not clear).
28. However, we found that there were several factors that reduced our concern that coordination might be occurring in local aggregates markets. These factors were:
  - (a) geographical differentiation of aggregates products;
  - (b) wide variation in competitive conditions (eg the number and identity of suppliers) from one local area to another; and
  - (c) the Majors' relatively modest (in general) returns and falling margins on their aggregates operations.
29. The result of our aggregates case studies also reduced our concern that coordination might be occurring in the two areas which we assessed. Neither the document review

for the case study areas nor our interviews with customers and non-Major suppliers suggested that coordination might be occurring in these local areas.

30. Overall, we did not find evidence indicating widespread competition problems across multiple local markets (whether as a result of unilateral market power or coordination). Our detailed analysis of the supply of aggregates in two areas of GB also did not find any evidence of competition problems with respect to these two areas. Given the lack of concerns raised by our analysis, both across multiple local markets and in the two specific areas we assessed, and given constraints on the time and resources available for our investigation overall, we did not carry out further analysis of individual local markets for aggregates. We have not identified any features giving rise to an AEC in any market in GB for the supply of construction aggregates through unilateral market power or coordination.
31. We considered that recent market developments, including the formation of Lafarge Tarmac and HCM, did not have a material impact on our competitive assessment of GB aggregates markets. Although Lafarge Tarmac is now, by some margin, the largest producer of aggregates in GB, these market developments have only very slightly increased the number of local aggregates markets with a high degree of concentration.

## **Cement**

32. In undertaking our competitive assessment of the GB cement markets, we examined aspects of market structure, market outcomes and conduct, as well as analysing the impact of recent market developments.
33. Evidence on market outcomes indicated that competition in the GB cement markets was not working effectively. This evidence included:

- (a) Increases in average cement prices in real terms between 2007 and 2011 and maintenance of the GB producers' variable profit margins—with three out of the four GB producers able to increase their margins—against a backdrop of declining demand (down 36 per cent from 2007 to 2009) and increasing costs. While we were told that the main reason for the stability or even increase in variable profit margins in 2009 was that GB cement producers had cut costs in response to the economic downturn, we did not see strong evidence that these efficiencies had been competed away and passed on (through lower prices) to cement buyers.
- (b) Profitability based on the continuing costs of supply across the GB producers (and for Lafarge, Hanson and Cemex taken together) exceeding the cost of capital from 2007 to 2011, despite the demand slump during this period and the fact that this profitability measure was not adjusted for the higher operating costs undoubtedly associated with some older and less well-located plant. In addition, the profitability of three out of four cement producers (on all the bases we analysed) rose to levels beyond those at that start of the period, despite the continued adverse trading conditions
- (c) There being only small changes in annual shares of sales (the most for any Major was four percentage points) despite the significant demand slump from 2007 to 2009.

34. We also found that customers who did not switch between cement suppliers did not benefit from the relatively lower prices of those customers that did switch—in other words, there was price discrimination.
35. In a well-functioning market, faced with a demand slump, significant excess capacity and high fixed costs, we would expect that market participants would compete vigorously on price to maintain volumes, resulting in greater volatility in shares and signifi-

cant erosion of margins with returns at or below the cost of capital (and not increasing beyond previous levels while adverse trading conditions continued).

36. To assist us in interpreting the results of our analysis, we assessed a large body of internal documentary evidence obtained from the Majors. We found that these documents provided direct evidence of coordination by Lafarge, Hanson and Cemex and/or a strategic approach by them to activity in the market that was aimed at coordinating to achieve market stability. The strength of the evidence in the internal documents varied over time. The more recent internal documents also provided evidence of examples of competition between GB producers.
37. We found that the GB cement markets were characterized by high concentration, a significant degree of transparency, frequent interactions between the main cement producers and a lack of complexity in the competitive environment and the products. These factors, taken together, suggest that the GB cement producers have strong awareness of each other's actions and are able to anticipate each other's future actions, leading to strategic interdependence in the competitive behaviour of the cement suppliers and coordination between Cemex, Hanson and Lafarge. Additional factors that in our view increased the structural susceptibility of these markets to coordination included high barriers to entry, limits to the competitive constraint imposed by imported cement and vertical integration into downstream operations.
38. In relation to imported cement, we noted that, while independent importers had experienced some growth in their collective share between 2007 and 2011 (from 6 per cent in 2007 to 9 per cent in 2011), their collective share of GB cement sales remained small (and had not changed in the few years) and the total volumes imported had not increased. We found that, although there was evidence that the GB

producers regarded imported cement as a competitive threat, the strength of the competitive constraint from imported cement was limited because:

- (a) the GB producers had a substantial short-run cost advantage over cement importers in competing for customers at the margins;
- (b) the higher costs faced by cement importers created incentives for them to price their cement just below the price of GB-produced cement; and
- (c) the GB producers considered, and in some cases took, specific steps to undermine the viability of imported cement, such as applying pressure to restrict cement supplies to independent importers, purchasing of import terminals and/or importers; leveraging of contacts with importers in other markets and targeting lower-priced cement selectively at customers of cement importers.

39. We found evidence that three GB cement producers (Cemex, Hanson and Lafarge) recognized the current (and past) structural susceptibility of the GB cement markets to coordination and took steps to exploit this susceptibility, using shares of sales as a focal point and with Lafarge taking a leadership role. This evidence included a strategic focus on maintaining market stability between the members of the coordinating group rather than independently pursuing unconstrained growth, frequently manifested in a focus on maintaining existing (or returning to pre-existing) relative shares of sales; price announcement behaviour (contributing to price leadership and price following, and to softening of customer resistance to price increases); tit-for-tat share balancing and retaliation; use of cross-sales as a mechanism for transparency, signalling and, on occasion, share balancing and retaliation; and attempts to target of importers beyond normal competition on price and service.

40. We concluded that, although the extent to which they were satisfied might vary over time, the conditions for coordination to be sustained were met in the GB cement markets (with shares of sales as the focal point) in relation to the ability to reach and

monitor coordination, the existence of a mechanism for internal sustainability and the external sustainability of coordination.

41. We described a mechanism for coordination which was supported by the available evidence. There was some evidence that there were periods when coordination was more successful, and periods when it was less successful (for example, in 2009 following one Major's large internalization of cement volumes).
42. We found that it was likely to be in the interests of Lafarge, Cemex and Hanson to adhere to the mechanism for coordination we described, whereas Tarmac was likely to be a fringe player. Furthermore, Lafarge's position as the largest cement producer, as well as the least vertically-integrated producer, was likely in our view to give it strong incentives to take a leadership role in the coordination—and in particular to take on more of the costs of coordination (including the costs of accommodating the growth in share of sales of fringe cement suppliers, ie Tarmac and cement importers). The different incentives of the GB producers (arising, for example, from differences in their size and in the extent to which they made external sales of cement) explained the different roles they adopted in the market, which in turn explained why shares of sales had not been perfectly stable despite the coordination which had been occurring in the market. Their different incentives also explained why asymmetries in their shares of sales, capacity and degree of vertical integration did not prevent—and might even facilitate—coordination.
43. In relation to recent market developments, the evidence and analysis available to us indicated that the structural susceptibility of these markets to coordination, and the behaviour of market participants seeking to exploit this susceptibility, had existed over a number of years, and had been resilient to other large changes in market conditions (in particular, the significant downturn in demand and the vertical inte-

gration of Hanson into cement production over the years 2007 to 2009). Therefore we considered that the replacement of Tarmac (a single plant producer which we had found to be outside the coordinating group of firms without coordination breaking down as a result) by HCM (which is also a single-plant producer—albeit with some additional capacity compared with Tarmac) as the smallest GB cement producer was likely to be insufficiently market disrupting on its own materially to reduce our concerns about coordination in the GB cement markets. Similarly, we did not consider that a possible future recovery in demand was likely to undermine coordination in these markets, given that we found that coordination persisted during the current period of significantly reduced demand.

44. We concluded that there was a combination of structural and conduct features that gave rise to an AEC in the GB bulk and bagged cement markets.
45. The structural features are:
  - (a) high market concentration;
  - (b) transparency of sales and production shares, wins and losses and customer–supplier relationships;
  - (c) high barriers to entry (including limits to the constraint imposed by imported cement);
  - (d) homogeneity of product;
  - (e) customer characteristics and behaviour (in particular, regularity of purchases, purchases at fixed locations, concentration of customer base and single sourcing for a particular job site); and
  - (f) vertical integration from cement into downstream operations.
46. The conduct features, the individual significance of which varies over time, are:

- (a) a strategic focus on maintaining market stability between the members of the coordinating group, frequently manifested in a focus on maintaining existing (or returning to pre-existing) relative shares of sales;
- (b) price announcement behaviour (which facilitates price leadership and price following, and softens customer resistance to price increases);
- (c) 'tit-for-tat' behaviour used to balance shares and for retaliation;
- (d) use of cross-sales as a mechanism for transparency, signalling and, on occasion, share balancing and retaliation; and
- (e) attempts to target importers beyond normal competition on price and service.

47. These structural and conduct features combine together to give rise to an overarching feature in the GB cement markets, namely coordination among Cemex, Hanson and Lafarge.
48. We found that the likely effect of these features was higher prices of cement in GB than would otherwise be the case for all GB cement users, whether this cement was ultimately sold through independent RMX and concrete producers, independent merchants or through the downstream businesses of the Majors.

### **GGBS in the GB cement markets**

49. We also found evidence of competition problems in relation to the supply of GGBS in GB. Although we did not define the GB cement markets to include GGBS, the GB cement markets include blended cement made with GGBS. Total GGBS production is equivalent to about 18 per cent of total cement production in GB. The constraint imposed on GGBS by PFA did not appear sufficient to offset any competition problems in the supply of GGBS.

50. Hanson supplies the vast majority of GGBS in the UK as a result of its contract with Tarmac (now Lafarge Tarmac) for the purchasing of GBS for grinding into GGBS, and Lafarge Tarmac's contracts with the GB steel producers for the production of GBS. There are no other suppliers of GB-produced GGBS, and there is evidence that imported GBBS faces disadvantages compared with GB-produced GGBS. Our comparison of Hanson's GGBS volumes, prices and margins with its cement volumes, prices and margins was consistent with Hanson possessing a degree of market power in relation to GGBS, resulting in higher prices for GGBS in GB than might otherwise be the case.
51. We found that Lafarge Tarmac's exclusive agreements with the GB steel producers for the production of GBS, and Hanson's exclusive long-term contract with Lafarge Tarmac for the production of GGBS, in combination with Lafarge Tarmac's and Hanson's participation in the GB cement markets, were features that gave rise to an AEC in the GB cement markets, also resulting in higher prices for cement than might otherwise be the case.

### **Detriment from AECs in GB cement markets**

52. We considered there to be a material customer detriment arising from the high cement prices which resulted from the two AECs we identified in the GB cement markets. Using one of several possible approaches to quantifying this detriment indicated that this detriment was of the order of £180 million over the period from 2007 to 2011. However, there are several reasons that we considered this figure likely to be an underestimate of the actual detriment arising. These reasons include the short-term impact on profitability arising from the cement producers' adjustment to the recent large reduction in cement demand and the possibility that detriment may manifest itself through the ongoing inefficiency of some suppliers rather than through

high profitability. We expect to refine our estimate of the detriment in the context of our work on remedies.

## **RMX**

53. In undertaking our competitive assessment of RMX markets in GB, we examined aspects of market structure, market outcomes and conduct, as well as analysing the impact of recent market developments
54. Our analysis indicated that:
- (a) Whilst the Majors collectively supplied about two-thirds of RMX at GB level, the extent of concentration in local markets for RMX appeared to be limited.
  - (b) The customer base for RMX was relatively fragmented compared with cement and aggregates and RMX customers tended to purchase on a project basis.
  - (c) Whilst not all local RMX producers might be able to supply customers requiring very large volumes of RMX for a particular project, such customers were also likely to have some purchaser power, and had other options such as tendering for (or self-supply through) an RMX site plant. RMX suppliers might not have to be in the vicinity of such a project to bid for it.
  - (d) Barriers to entry and expansion were low.
  - (e) The generally large ROCEs in 2007 by the Majors in their RMX operations had deteriorated a great deal since then, and the Majors' RMX operations taken together had been loss-making since 2008.
  - (f) For each Major, RMX margins (at divisional level) had eroded over the period 2007 to 2011, and the mid-tier RMX producers had also faced margin erosion.
55. We therefore found that widespread unilateral market power in the GB RMX markets was unlikely. We found little evidence that competition for customers requiring very

large volumes of RMX for particular projects would be less effective than competition for other customers.

56. The supply of RMX in GB appeared to have fewer structural features than in the case of aggregates or cement that might give rise to concerns about coordination. There was some evidence that the Majors collectively held a high market share in some local RMX markets. However, the lack of barriers to entry and expansion into RMX supply, the complexity of maintaining coordination in multiple local RMX markets, the declines in the profitability of the Majors' RMX operations since 2007, coupled with the erosion of their margins (at divisional level), meant that we found that widespread coordination in the GB RMX markets was unlikely.
57. Overall, we did not find evidence indicating widespread problems across multiple local RMX markets (whether as a result of unilateral market power or coordination). Given the lack of concerns raised by our analysis and given constraints on the time and resources available for our investigation overall, we did not carry out further analysis of individual local markets for RMX. We have not identified any features giving rise to an AEC in any market in GB for the supply of RMX through unilateral market power or coordination.
58. We considered that recent market developments, including the formation of Lafarge Tarmac and HCM, did not have a material impact on our competitive assessment of the GB RMX markets. These developments had resulted in little overall consolidation in shares of supply of RMX at GB level and we had limited concerns about the impact of these market developments on concentration in local markets.

## Vertical effects

59. We assessed whether vertical integration in aggregates, cement and RMX gave rise to one or more AECs through exclusionary behaviour towards rivals. Most exclusionary behaviour concerns expressed by parties related to the possibility of foreclosure<sup>8</sup> of the supply of cement (rather than aggregates) to rivals in GB RMX markets.
60. We found that the following evidence did not point in the direction of any widespread foreclosure:
- (a) High-level evidence on RMX shares of supply: the collective share of supply of RMX in GB held by independent RMX producers had grown from 21 per cent in 2005 to 27 per cent in 2011.
  - (b) Entry and exit of independent RMX producers: although there had been some exit by independent RMX producers in the period between 2007 and 2010, the Majors had closed many more RMX sites than the independent RMX producers during that period. In addition, while there had been net exit by the Majors between 2007 and 2010, there had been a small net entry by independent RMX producers.
  - (c) RMX-related pricing behaviour of the Majors: there was evidence that the average price of cement paid by independent RMX producers had increased more than the average downstream price of RMX, suggesting that the margin available to RMX producers over cement costs was likely to have reduced between 2007 and 2011. However, the evidence on the internal pricing policies of the Majors (namely that they set relatively high internal transfer prices for aggregates to their internal RMX businesses) and on the prices at which the GB cement producers sold cement to each other (namely that, in many cases, GB cement producers tended to charge each other higher prices, on average, than they did to indepen-

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<sup>8</sup> Foreclosure occurs when a vertically-integrated company restricts its rivals' access to customers or to an essential input. If the strategy is successful, rivals may be excluded from the market (total foreclosure) or be unable to compete effectively (partial foreclosure).

dent customers) suggested that, rather than trying to foreclose independent RMX producers, the aim of the Majors was to soften competition in the downstream RMX markets.<sup>9</sup>

61. On this basis and given the constraints on the time and resources available for our investigation overall, we did not have reason to prioritize further work to establish whether any foreclosure might have occurred in particular local markets for RMX, and did not do so.

### **Effects of policy and regulation on competition**

62. We considered whether certain aspects of policy and regulation that covered the relevant markets could affect the way competition works in those markets.
63. We examined the operation of aggregates landbanks in detail.<sup>10</sup> We had several concerns about the operation of landbanks, including the possibility that existing aggregates producers might have an incentive to obtain and hold sites with permitted reserves (either without developing them further, or by mothballing previously operational sites) so that the landbank in an area remained above the minimum target period and new entrants would find it difficult to obtain planning permission for new sites.
64. However, our analysis of aggregates landbank data indicated that aggregates producers' shares of permitted reserves in landbanks were in most cases in proportion to their share of supply of aggregates. Further, we saw evidence that the planning system was felt to work well and applications for new primary aggregates sites did

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<sup>9</sup> Although we noted that vertical integration could have the effect of dampening competition in RMX markets, we thought the main impact of vertical integration would be to dampen competition between cement suppliers through the role of vertical integration in coordination.

<sup>10</sup> In the context of aggregates planning, a 'landbank' is defined as a stock of planning permissions (as measured in years) for permitted reserves (ie reserves for which planning permission has been granted allowing them to be extracted) to ensure continuity of aggregates production for a set number of years based on current extraction rates.

not tend to be constrained by landbank considerations. We also noted the arguments that holding sites with permitted reserves without developing them (or mothballing previously operational sites) in order to preserve landbanks and prevent competitors obtaining planning permission (a) would not be commercially viable, and (b) would raise the possibility that the relevant planning authorities could issue prohibition orders on such sites which would prevent the extraction of aggregates in the future. We also noted that the Government's new national planning framework and planning guidance helped address our landbank concerns. Taken together, we found that these factors suggested that planning policy concerning aggregates landbanks was unlikely to be distorting competition in local aggregates markets.

65. We examined the extent to which the aggregates planning system had the potential to increase market transparency between suppliers and found that it was unlikely that commercially sensitive information would be exchanged between suppliers during the planning process.
66. We also examined the effect of the aggregates levy on competition. The aggregates levy (currently £2 per tonne when primary aggregates are commercially exploited) was introduced in 2002 with the aims of reflecting some the environmental costs of quarrying and introducing a price incentive to encourage the use of waste, spoil and recycled aggregates.
67. We recognized that the introduction of the aggregates levy had placed an additional cost on primary aggregates production resulting in an increase in the price of primary aggregates. We also recognized that the effectiveness of the levy in incentivizing the use of secondary and recycled aggregates (which is the primary aim of the levy) might be limited by the extent of substitutability between primary aggregates and secondary and recycled aggregates. However, we concluded that the aggregates

levy did not give rise to specific concerns relating to competition, as the effects of the levy on patterns of aggregate use were consistent with—and did not extend beyond—the intended policy aims. We considered that, while it might be possible that the Majors could cover the cost of the levy from other areas of their business more easily than smaller producers, any potential distortion in competition arising from the different scale and diversity of activities of producers was not a direct consequence of the aggregates levy. We found that, given that the levy applied in the same way to all primary aggregates producers, there was no distortion between competitors introduced as a result of the levy.

68. The European Union Emissions Trading Scheme (EU ETS) is a carbon trading system designed to limit and reduce the greenhouse gas emissions produced by energy-intensive industry sectors (including cement clinker production) and electricity generators. We considered the effect of the ETS ‘partial cessation’ rules on the incentives of EU cement producers in certain countries (such as Spain, Greece and the Republic of Ireland) where domestic demand was currently extremely low relative to production levels in previous years. We looked at their incentives to export more cement to GB as a result of the partial cessation rules as part of our assessment of the constraint from imported cement on GB-produced cement.<sup>11</sup> Several other concerns were also raised with us about the effect of the ETS on competition in the GB cement markets, including that:

(a) it gave cement producers outside the EU (which were not covered by the ETS) a significant competitive advantage relative to EU producers because they did not incur the costs associated with the ETS; and

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<sup>11</sup>These incentives arise because, under the partial cessation rules, cement producers that are not producing at least 50 per cent of their historical clinker production (with thresholds also at 25 and 10 per cent) have their EU Allowances (ie permits to emit CO<sub>2</sub> under the ETS) dramatically reduced. Because EU Allowances are currently allocated free to EU cement producers and are tradable, their loss would represent a significant loss of revenue for the cement producers affected.

(b) the partial cessation rule could affect cement production efficiencies, as it gave cement producers incentives to keep all their plants open, albeit at a reduced rate of capacity utilization, so as to obtain a full entitlement of EU Allowances.

69. We noted that it could, in principle, be the case that the ETS created a distortion in the relative costs of producing cement inside and outside the EU. However, because none of the cement supplied in GB is currently imported into GB from outside the EU, we do not believe that the existence of the ETS is distorting competition in the GB cement market in favour of non-EU producers to a material extent.
70. We saw evidence that the way EU Allowances were allocated to cement producers under the ETS, together with the partial cessation rule, created incentives for GB producers to allocate production between their plants in a less efficient way than would otherwise be the case, in order to retain in full their free allocations of EU Allowances. This means that some less efficient plants may continue to operate and that economies of scale from concentrating production at fewer plants are not being realized. These inefficiencies could have the effect of increasing the cost of cement production and ultimately increasing the price consumers pay for cement. However, we did not find evidence that, even if marginal costs are increased for some producers as a result of such inefficiencies, this has had a material effect on cement prices. Therefore we reached no decision on whether the incentives for inefficient production created by the ETS partial cessation rules gave rise to an AEC. We were, however, concerned that we observed these incentives for inefficient production (ultimately resulting in higher carbon emissions than might otherwise be the case), which are generated by the way in which EU Allowances are allocated to cement producers under the ETS and the partial cessation rules.

71. We also examined the nature and interaction of several UK government schemes relating to energy efficiency, and their possible impact on competition in the relevant markets:

(a) The Carbon Reduction Commitment (CRC) started in April 2010 and is aimed at improving energy efficiency for large organizations whose electricity consumption exceeds 6,000 MWh. The CRC operates as a UK-wide 'emissions trading' scheme and requires each participating organization to (among other things) purchase allowances from the Government to cover its carbon emissions for the previous year. The CRC does not apply to those carbon emissions that are already covered by the ETS, and therefore excludes cement producers in the UK. However, the CRC does cover large aggregates sites.

(b) A Climate Change Agreement (CCAg) is a voluntary agreement entered into with the Government by a sector. Under a sector 'umbrella agreement', any operator (that meets the eligibility criteria) in certain energy-intensive industries can enter the sector agreement. The cement/clinker and slag grinding (eg GGBS) sectors (among others) have entered into CCAgs with the Government. Aggregates producers are, however, not covered by a CCAg.

72. We found that these policies and their interaction distorted competition in that they had different impacts on different types of producers of the reference products—in particular, aggregates—in a manner that was unrelated to the energy efficiency of their operations (ie the intended policy outcome of these regulations). For example, an integrated aggregates and cement producer which had a CCAg would be exempt from the CRC but a stand-alone large aggregates company would have to comply with the CRC in full. This arises because:

(a) the CRC does not apply to those carbon emissions already covered by the ETS (eg cement operations) but covers large aggregates sites;

(b) smaller aggregates producers would be exempt; and

(c) if over 25 per cent of an organization's emissions are covered by a CCAg (which cover, among others, producers of cement but not producers of aggregates), it will be exempt from certain aspects of the CRC ('the CCAg exemption').

73. We found that the interaction between CCAgs and the CRC appeared to increase the costs of some aggregates producers more than others, regardless of the relative efficiencies of producers in terms of carbon emissions per tonne of aggregates produced. However, the Government proposes to abolish the CCAg exemption to the CRC from 1 April 2014 under an Order currently before Parliament. We therefore did not find that the interaction between CCAgs and the CRC was a feature giving rise to an AEC.

## Provisional findings

### 1. The reference and our statutory task

- 1.1 On 18 January 2012, the OFT referred the supply or acquisition of aggregates, cement and RMX to the CC for investigation. The reference was made under sections 131 and 133 of the Act. In accordance with subsections 133(2) and (3)(a) and (b) of the Act, the OFT required the CC to confine its investigation to the effects of features of such market or markets as exist in connection with the supply or acquisition of such goods or services in GB.
- 1.2 The terms of reference for our investigation are provided in Appendix 1.1. This document sets out our provisional findings from this investigation. We are required to publish our final report by 17 January 2014.
- 1.3 Section 134(1) of the Act requires us to decide whether ‘any feature, or combination of features, of each relevant market prevents, restricts or distorts competition in connection with the supply or acquisition of any goods or services in the United Kingdom or a part of the United Kingdom’. If the CC decides that there is such a feature or combination of features, then there is an AEC.<sup>1</sup>
- 1.4 Under section 131(2) of the 2002 Act, a ‘feature’ of the market refers to:
- the structure of the market concerned or any aspect of that structure;
  - any conduct (whether or not in the market concerned) of one or more than one person who supplies or acquires goods or services in the market concerned; or
  - any conduct relating to the market concerned of customers of any person who supplies or acquires goods or services.

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<sup>1</sup> [Section 134\(2\)](#) of the Act.

- 1.5 If the CC finds that there is an AEC, it is required under section 134(4) of the Act to decide whether action should be taken by it, or whether it should recommend the taking of action by others, for the purpose of remedying, mitigating or preventing the AEC, or any detrimental effect on customers<sup>2</sup> so far as it has resulted from, or may be expected to result from, the AEC; and, if so, what action should be taken and what is to be remedied, mitigated or prevented. The Act requires the CC ‘to achieve as comprehensive a solution as is reasonable and practicable to the AEC and any detrimental effects on customers so far resulting from the AEC’.<sup>3</sup> In considering remedies, the CC may take into account any relevant consumer benefits, as defined in the Act, arising from the feature or features of the market.<sup>4</sup>
- 1.6 Our terms of reference (see Appendix 1.1) state that aggregates includes primary, secondary and recycled aggregates; cement means grey cement; and RMX includes on-site batching (volumetric trucks). We consider that grey cement means not just ordinary cement but cement blends in which ordinary cement is blended with other cementitious products<sup>5</sup> to produce cements of differing physical properties. All these products are described further in Section 2 of this report, along with the vertical relationships between them.<sup>6</sup>
- 1.7 In the remainder of this section, we set out (a) the background to the reference; (b) our conduct of the investigation to date; and (c) the structure of these provisional findings.

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<sup>2</sup> A detrimental effect on customers is defined in [section 134\(5\)](#) of the Act as one taking the form of: (a) higher prices, lower quality or less choice of goods or services in any market in the UK (whether or not the market to which the feature or features concerned relate); or (b) less innovation in relation to such goods or services.

<sup>3</sup> [Section 134\(6\)](#) of the Act.

<sup>4</sup> [Section 134\(7\)](#) of the Act.

<sup>5</sup> Cementitious products include GGBS and PFA—see Section 2.

<sup>6</sup> In particular, cement and aggregates are key inputs into the production of RMX.

## ***Background to the reference***

### *The OFT's reference decision*

1.8 The OFT commenced a market study of the aggregates sector on 7 September 2010. Its study revealed a range of concerns among stakeholders about competition. Most concerns related to the extent of vertical integration between the aggregates, cement and RMX markets, and to the conduct of the Majors in these markets.<sup>7</sup> The OFT therefore decided in February 2011 to extend the scope of its market study to include cement and RMX.

1.9 The OFT found that the industry had a number of features which might adversely affect competition:<sup>8</sup>

- barriers to entry, in terms of the difficulty of obtaining planning permission and physical capital requirements;
- high concentration, with the Majors accounting for 90 per cent of the cement market, 75 per cent of aggregates sales and about 70 per cent of RMX production;
- vertical integration, with complaints about vertically integrated companies refusing to supply or discriminating against non-integrated competitors;
- homogeneous products with little differentiation between companies in terms of brand or quality;

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<sup>7</sup> In this report, we use the term 'the Majors' to refer to the five largest heavy building materials producers in GB. At the time of the OFT's market study these companies were (in alphabetical order): Aggregate Industries UK Limited (Aggregate Industries), Cemex UK Operations Limited (Cemex), the UK construction and building materials businesses of Hanson and HeidelbergCement AG (Hanson), Lafarge Aggregates Limited and Lafarge Cement UK Limited (together Lafarge) and the UK and international operations of Anglo American plc's construction and building materials arm (Tarmac). Following the market developments described in paragraphs 1.13 to 1.20, these companies are (in alphabetical order): Aggregate Industries UK Limited (Aggregate Industries), Cemex UK Operations Limited (Cemex), the UK construction and building materials businesses of Hanson and HeidelbergCement AG (Hanson), the UK cement, concrete, aggregates and asphalt business of Mittal Investments Sarl (Hope Construction Materials (HCM)) and the entity created on 7 January 2013 as a result of the JV between Lafarge Group and Anglo American in respect of their UK activities in the production of cement, aggregates, asphalt and RMX (Lafarge Tarmac). Where necessary in this report, we distinguish between the pre-2013 Majors and the Majors as at 2013. All the Majors with the exception of HCM have significant aggregates operations in GB, and they also all have significant RMX operations in GB. All the Majors with the exception of Aggregate Industries produce cement in GB, and there are no other cement producers in GB.

<sup>8</sup> *Aggregates: The OFT's reason for making a market investigation reference to the Competition Commission*, January 2012, OFT1358, [ref]: [www.of.gov.uk/shared\\_of/market-studies/of1358ref.pdf](http://www.of.gov.uk/shared_of/market-studies/of1358ref.pdf).

- transparency facilitated (among other things) by cross-sales,<sup>9</sup> industry reports and the planning system; and
- multi-market contacts between companies.

1.10 The OFT also found evidence that competition might not be working well in these markets, in particular due to: difficulties faced by independent RMX producers in obtaining competitive quotes for cement from alternative suppliers; a possible 'squeeze' between the price of cement and the price of RMX; and pricing letters from the Majors indicating that pricing rivalry was not as intense as it could be. As noted, the OFT made its decision to refer the aggregates, cement and RMX markets to the CC on 18 January 2012.

#### *European Commission investigation under Article 101 TFEU*

1.11 On 10 December 2010, DG COMP announced that it had opened an investigation into suspected anti-competitive practices by several manufacturers of cement and related products in various European countries including the UK, involving possible infringements of Article 101(1) of the TFEU.<sup>10</sup> DG COMP said that it intended to investigate in particular possible import/export restrictions, market sharing and price coordination in the markets for cement and related products.

1.12 The DG COMP investigation remained open during our market investigation. It has not prevented us conducting a full investigation of features which may adversely affect competition in the markets referred to us. We have kept DG COMP informed regarding the issues that we have considered in the course of our investigation, along with the progress and timing of our investigation more generally. We note that

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<sup>9</sup> Sales and purchases of aggregates and cement between the Majors.

<sup>10</sup> [http://europa.eu/rapid/press-release\\_IP-10-1696\\_en.htm?locale=en](http://europa.eu/rapid/press-release_IP-10-1696_en.htm?locale=en).

the nature and purpose of our investigation are different from those of the investigation being carried out by DG COMP.

### *Market developments*

- 1.13 In recent years, there have been some significant developments in these markets, which we have taken into account in our investigation.
- 1.14 On 18 February 2011, Lafarge Group and Anglo American announced a proposed JV of their UK construction materials businesses (the Anglo–Lafarge JV), including their aggregates, cement, RMX, asphalt and contracting operations, in which each would take a 50 per cent stake.
- 1.15 On 2 September 2011, the OFT referred to the CC for investigation and report under section 33(1) of the Act the Anglo–Lafarge JV. The CC was required to determine whether the proposed JV might be expected to result in what is known as a ‘substantial lessening of competition’ (SLC) within any market or markets in the UK for goods or services.<sup>11</sup>
- 1.16 The CC published its report on the Anglo–Lafarge JV on 1 May 2012. In that report, the CC concluded that the proposed JV might be expected to result in an SLC leading to prices that would be higher than might otherwise be the case in the following markets:
- the market for the supply of bulk cement in the UK;
  - 19 local markets and two national markets for the supply of various types of aggregates;

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<sup>11</sup> The statutory questions addressed in a merger inquiry such as the Anglo–Lafarge JV inquiry under section 33 of the Act are different from those addressed in a market investigation (such as this one) under sections 131 and 133 of the Act. In a merger inquiry, the CC is required to determine whether the merger might be expected to result in an SLC—the CC does not evaluate the effectiveness of competition in the market more broadly. In contrast, in a market investigation, the CC is required to examine how competition functions in the referred markets. It is also important to note that the CC members of the Group responsible for taking decisions in this market investigation are different from those responsible for taking decisions in the Anglo–Lafarge JV inquiry.

- two local markets for the supply of asphalt; and
- seven local markets for the supply of RMX.

1.17 The CC therefore required Anglo American and Lafarge Group to divest various cement, aggregates, RMX and asphalt assets as a condition for allowing the Anglo–Lafarge JV to proceed.

1.18 On 7 January 2013, Anglo American and Lafarge Group concluded the divestiture of a package of cement, RMX, aggregates and asphalt operations to Mittal Investments Sarl (MI), thereby creating HCM. This transaction implemented the majority of the divestitures required by the CC following its report on the Anglo–Lafarge JV. On the same day, Anglo American and Lafarge Group completed their joint venture, creating a new entity called Lafarge Tarmac.

1.19 To implement other divestitures required by the CC as a result of the Anglo–Lafarge JV inquiry, Anglo American proposed to dispose of Tarmac’s stake in Midland Quarry Products Ltd (MQP), a 50:50 JV between Tarmac and Hanson involved in quarrying, dry stone processing, production of asphalt, and the supply of rail ballast. Hanson acquired the 50 per cent of MQP that it did not already own on 2 April 2013.

1.20 Further details of these market developments, and our assessment of their impact on competition, are in Sections 5, 6, 7, 8 and 9 of this report.

### ***Conduct of the investigation***

1.21 The following paragraphs provide an overview of the process we followed in our investigation and how we utilized the evidence, data and information we received. Further details can be found in Appendix 1.1.

- 1.22 We published an issues statement on 8 March 2012 based on the terms of reference and the initial information and evidence we had received. On 16 May 2012, we published a notice setting out how we intended to handle the relationship between our investigation, the CC's Anglo American–Lafarge JV inquiry and DG COMP's Article 101 TFEU investigation. On 29 May 2012, we published a notice of our intention to carry out aggregates markets case studies in certain parts of GB.
- 1.23 We held hearings with suppliers of aggregates, cement and RMX, relevant trade associations and customers between May 2012 and October 2012.
- 1.24 Following receipt of further evidence, on 26 November 2012 we published an updated issues statement. We held second hearings with the Majors in December 2012 and an initial hearing with MI in January 2013. We published a series of working papers between November 2012 and March 2013.
- 1.25 We published a considerable number of documents on the CC website. These include non-confidential versions of parties' written submissions, non-confidential versions of summaries of hearings with a number of parties, as well as our issues statements, working papers, and the results of a number of studies and analyses. Further details can be found in Appendix 1.1.
- 1.26 The updated issues statement and working papers took account of submissions from parties in response to the initial issues statement, responses to questionnaires and evidence provided in hearings with the main parties and third parties.

### ***Structure of provisional findings***

- 1.27 This document, together with its appendices, constitutes our provisional findings. It refers, where appropriate, to material published separately on the CC website. The

report, however, is self-contained and is designed to provide all material necessary for an understanding of our provisional findings. The accompanying Notice of Possible Remedies sets out, as a basis for discussion, the possible remedies which seem appropriate for further consideration to address those features which in our view give rise to an AEC.

1.28 Following consideration of responses to these provisional findings and our Notice of Possible Remedies, as well as any further evidence received, we shall publish our final report.

1.29 The remainder of these provisional findings is set out as follows:

- Section 2 describes the background to the aggregates, cement and RMX industries, including relevant policy frameworks and regulation of the industry.
- Section 3 provides some reference information on the main construction materials companies active in the aggregates, cement and RMX industries.
- Section 4 establishes the framework for our competitive assessment of these industries.
- Section 5 considers market definition for aggregates, cement and RMX.
- Section 6 sets out our analysis and assessment of competition in the supply and acquisition of aggregates.
- Sections 7 and 8 set out our analysis and assessment of competition in the supply and acquisition of cement.
- Section 9 sets out our analysis and assessment of competition in the supply and acquisition of RMX.
- Section 10 describes our assessment of the effect on competition of vertical integration between cement and/or aggregates on one hand, and RMX on the other.

- Section 11 sets out our consideration of the effects of applicable policy and regulation on competition in the supply of aggregates, cement and RMX.
- Section 12 presents our provisional findings in relation to the statutory questions that we are required to answer.

## **2. Industry background**

### ***Introduction***

- 2.1 In this section, we provide background information on aggregates, cement and RMX and set out at a high level how total GB demand for these products has changed over the last ten years. For each product, we describe relevant regulations and public policies.
- 2.2 We conclude by describing the input relationships between these products, and their extent in practice.

### ***Aggregates***

- 2.3 The following paragraphs cover:
- (a) the different types of aggregates available in GB;
  - (b) how total GB demand for aggregates has varied over the last ten years;
  - (c) the planning regime for land-won primary aggregates (as defined in paragraphs 2.14 to 2.30);
  - (d) marine aggregates (as defined in paragraphs 2.31 to 2.35) and the licensing regimes for the dredging of marine aggregates;
  - (e) secondary and recycled aggregates (as defined in paragraphs 2.36 and 2.37) and the applicable planning regimes; and
  - (f) the aggregates levy.
- 2.4 We return to items (c) to (f) in Section 6 (as part of our competitive assessment of the supply of aggregates in GB) and Section 11 (as part of our assessment of the impact on competition of policy and regulation). Where necessary, further details are provided in Appendix 2.1.

## *Description of products*

- 2.5 Aggregates are the granular base materials used in the construction of roads, buildings and other infrastructure. Aggregates may be divided into:
- (a) primary aggregates, which are extracted from quarries, pits and (in the case of marine aggregates) the seabed;
  - (b) secondary aggregates, which are by-products of industrial and mining processes;<sup>1</sup> and
  - (c) recycled aggregates, which are produced, for example, from demolition sites and construction waste.<sup>2</sup>
- 2.6 Primary aggregates comprise sand and gravel and crushed rock (and a number of products within these two broad categories<sup>3</sup>):
- (a) crushed rock is quarried mainly from hard, naturally occurring rock deposits (eg granite, gritstone and limestone); and
  - (b) sand and gravel is sourced from naturally occurring alluvial deposits on land or on the seabed.
- 2.7 To produce crushed rock, rock is blasted from a quarry, then crushed and screened (ie sorted into different sizes—this process is also known as ‘grading’). The production of sand and gravel aggregates involves crushing (where necessary), washing, screening and clarification processes.
- 2.8 GB has a ‘rock line’ which extends roughly from Weymouth in the South-West to Kingston-upon-Hull in the North-East. To the north of the rock line, particularly in Scotland, Wales and north England, there are large natural deposits of rocks of the

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<sup>1</sup> For example, steel and blast furnace slag (by-products of steel and iron manufacturing processes respectively) and china clay and slate quarry waste.

<sup>2</sup> Other sources include highway resurfacing (which produces asphalt planings), rail ballast, excavation, municipal waste and utility operations.

<sup>3</sup> For example, crushed rock aggregates include graded, sub-base, fill and dust products and sand and gravel aggregates include gravel, fine sand and coarse sand products.

type that can be accessed for extraction and crushing. By contrast, to the south of this line, particularly in East Anglia and the South-East, naturally occurring deposits of sand and gravel are abundant but there is little or no accessible rock. Some exceptions to this exist, for example there are large deposits of granite in Leicestershire.

2.9 Aggregates are classified by the grade (ie size) of the material:<sup>4</sup>

(a) Fine aggregates are generally materials with a particle size of less than 5mm diameter. Fine aggregates include dust produced by crushing rock, gravel, recycled or secondary materials as well as naturally occurring sands.

(b) Coarse aggregates are materials that are produced to a specific grading above 5mm diameter. In most applications the sizes used are 10mm, 14mm, 20mm, 28mm and 40mm, although larger materials may be produced.

(c) Granular aggregates do not have a uniform size and are used to provide stability in foundation layers and bulk fill applications. They are composed of a combination of coarse and fine materials. The coarse materials provide strength and bulk while the finer component binds the material together and provides stability when compacted.

2.10 Producing a specific grade of primary aggregate necessarily results in a variety of other grades being co-produced.

2.11 Aggregates are used mainly for construction purposes and we use the term 'construction aggregates' to refer to aggregates used for such purposes. These applications include:

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<sup>4</sup> Different producers may adopt slightly different classifications of these grades.

- (a) as a sub-base (the layer of stone which forms the foundation for many construction projects) and for other structural fills. In this report, we refer to these uses as 'general construction uses';
- (b) in the production of RMX;
- (c) in the production of other concrete products; and
- (d) in the production of asphalt.

2.12 There are also specific types of primary aggregates for certain 'specialist' applications.<sup>5</sup> They include (but are not limited to):

- (a) Rail ballast, which is a specific type of crushed rock aggregate used as a bedding material underneath railway tracks. Rail ballast is resistant to pressure and breakage and inhibits the growth of plants under the tracks.
- (b) HPL, which is limestone with a calcium carbonate content of over 95 per cent, and which is used for its chemical characteristics. It is also known as chemical stone, and is used in industrial applications including flue gas desulphurization at coal-fired power plants<sup>6</sup> and the production of chemicals.<sup>7</sup> Limestone powders derived from HPL are also used in the agricultural and horticultural sectors, although the precise chemical composition is not a key property of limestone used in this application.
- (c) High polished stone value<sup>8</sup> (PSV) aggregates, which are derived from crushed rock or sand and gravel sources.<sup>9</sup> High PSV aggregates are used for asphalt

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<sup>5</sup> We estimate that in 2010, around 5 per cent of UK aggregates production was for industrial, agricultural and horticultural (ie non-construction) use. However, our definition of specialist aggregates is broader than this, and includes rail ballast and high PSV stone, indicating that 5 per cent would be an underestimate of the proportion of aggregates production accounted for by specialist aggregates. Source: BGS Minerals for 2010.

<sup>6</sup> FGD is the abatement of acid gas emissions from coal-fired power stations. Coastal stations use seawater to scrub acids from the combustion gases, while inland stations use a slurry of limestone, created by milling of HPL with water at the power stations. The slurry is injected into the gas stream to react with the acids, principally sulphur dioxide, to form gypsum, which is created as a by-product of this process.

<sup>7</sup> Including soda ash, precipitated calcium carbonate and sinter.

<sup>8</sup> Polished stone value is an attribute of aggregates. The higher the PSV of a particular aggregate, the greater the skid resistance of the asphalt produced using that aggregate.

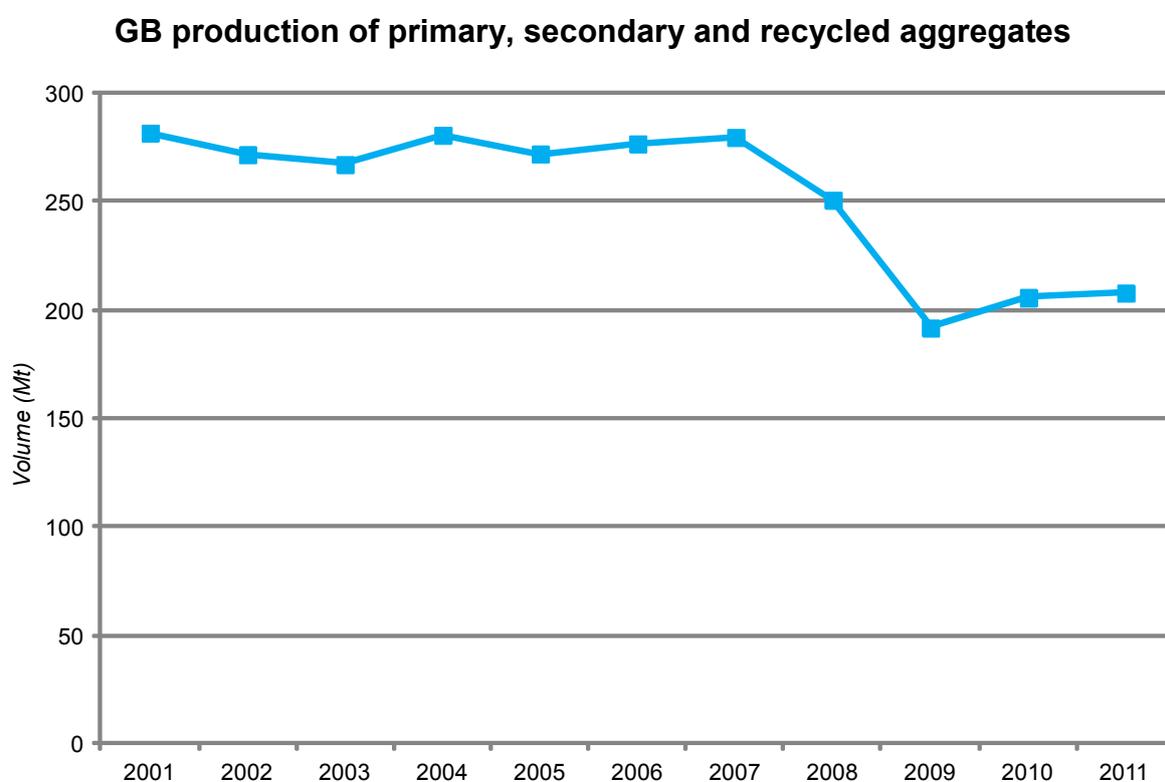
<sup>9</sup> High PSV materials are also produced from secondary aggregates (in particular, slag).

road surfacing in situations where there are high levels of traffic, high-speed roads or accident risk areas such as school crossings.<sup>10</sup>

### *Demand for aggregates in GB*

2.13 Figure 2.1 shows total GB production volumes of aggregates (primary, secondary and recycled) over the period 2001 to 2011. A significant downturn in production (a decline of 31 per cent) over the period 2007 to 2009 can be seen, coinciding with the UK recession.

FIGURE 2.1



Source: Minerals Products Association (MPA), February 2012.

### *The planning regime for land-won primary aggregates*

#### *Overview of GB aggregates planning regime*

2.14 In GB, national policy on land use planning, both in general and in particular for aggregates extraction, forms an integral part of the Government's wider economic

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<sup>10</sup> We note that rail ballast and high PSV aggregates for road surfacing could strictly be considered construction applications, but, for the purposes of this report, we have found it clearer to deal with them as specialist applications.

and environmental policy objectives. Consequently, the broader objective of ‘sustainable development’ features heavily as a general planning policy objective.

- 2.15 The legal framework in GB within which the current planning regime operates was first set out in the Town and Country Planning Act 1947 and the Town and Country Planning Act 1990 (both, as amended), and further developed through subsequent legislation, eg the Planning and Compulsory Purchase Act 2004.<sup>11</sup> Planning legislation and policy is a devolved matter and in GB, responsibility for developing each nation’s planning policy framework lies with the Department for Communities and Local Government (DCLG) for England, the Welsh Government for Wales and the Scottish Government for Scotland.
- 2.16 Land-won construction aggregates account for around 75 per cent of all minerals extracted from the UK land mass,<sup>12</sup> and planning in relation to land-won primary aggregates forms a significant part of the minerals<sup>13</sup> planning activities of each national body.
- 2.17 The planning systems throughout GB are ‘plan-led’, whereby the foundation of each system is the preparation of strategic plans by local authorities which set out how they propose land will be used within their local areas. In the case of minerals planning, the relevant local authority is termed a ‘Minerals Planning Authority’ in England or Wales, or a ‘Planning Authority’ in Scotland.<sup>14</sup> For ease of reference, for the remainder of this section, the term ‘LMPA’ is used to refer to the relevant local minerals planning authorities in England, Wales and Scotland.

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<sup>11</sup> [www.bgs.ac.uk/mineralsuk/planning/legislation/home.html#LUP](http://www.bgs.ac.uk/mineralsuk/planning/legislation/home.html#LUP).

<sup>12</sup> British Geological Survey: *Managing aggregates supply in England, A review of the current system and future options*, 2008, Section 2.1.

<sup>13</sup> In the UK, ‘minerals’ are defined in Town and Country Planning legislation as ‘all substances in, on or under land of a kind ordinarily worked for removal by underground or surface working, except that it does not include peat cut for purposes other than for sale’. Source: [www.bgs.ac.uk/mineralsuk/planning/legislation/home.html](http://www.bgs.ac.uk/mineralsuk/planning/legislation/home.html).

<sup>14</sup> In England, the LMPA is either the County Council, where there are two tiers of local government (counties and districts), or a Unitary Authority elsewhere. In Wales, the LMPA is the County Council or County Borough Council, and in Scotland, the Planning Authority is a Unitary Authority. Each National Park is also an LMPA or a Planning Authority.

- 2.18 An LMPA has the following primary planning responsibilities:<sup>15</sup>
- (a) formulating local policies and plans to guide future developments in line with the relevant national planning policy framework;
  - (b) assessing, managing and controlling individual developments that are proposed through deciding planning applications; and
  - (c) enforcing, and monitoring, of existing developments to ensure that they operate within the terms of their planning permissions.<sup>16</sup>
- 2.19 An LMPA's policy on minerals development for its local area is set out in its Local Minerals Plan (in England) or its Local Development Plan<sup>17</sup> (in Wales and Scotland) (together, the 'Local Plan'), which must take account of the relevant national planning policy, and ultimately forms the local policy framework upon which decisions on individual planning applications are made. Each nation's planning legislation requires that decisions must be taken in accordance with the LMPA's Local Plan unless material considerations indicate otherwise.<sup>18</sup> Further details about the preparation of Local Plans are in Appendix 2.1.
- 2.20 Where planning permission (ie formal approval) is granted, it is often with conditions or obligations attached.<sup>19</sup> In England, once an LMPA deems that a planning application is valid, it has eight weeks to reach its decision or 13 weeks in the case of applications for major developments, which include 'the winning and working or minerals or the use of land for mineral-working deposits'. If an Environmental Statement accompanies the application, the LMPA has 16 weeks to determine the application. Longer time periods for determination may be agreed in writing between the

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<sup>15</sup> [www.bgs.ac.uk/mineralsuk/planning/legislation/home.html](http://www.bgs.ac.uk/mineralsuk/planning/legislation/home.html).

<sup>16</sup> [www.sustainableaggregates.com/overview/policy\\_extended.htm](http://www.sustainableaggregates.com/overview/policy_extended.htm).

<sup>17</sup> In Wales, the Local Development Plan takes into account the relevant national planning policy framework and the Regional Technical Statements on Aggregates for South and North Wales. In Scotland, the Local Development Plans and also the 'Strategic Development Plans' contain the LMPAs' minerals policies. Sources: Welsh Government and Scottish Government.

<sup>18</sup> The DCLG told us that what constituted a material consideration was a matter for each particular case, but ultimately this was determined by the High Court.

<sup>19</sup> [www.bgs.ac.uk/Planning4Minerals/Glossary.htm#handbank](http://www.bgs.ac.uk/Planning4Minerals/Glossary.htm#handbank).

applicant and the LMPA. Further details on the planning process for England are in Appendix 2.1, paragraphs 14 to 18.

2.21 Aggregates reserves which have the benefit of planning permission for extraction are referred to as 'permitted reserves'. Appendix 2.1, Table 1, shows the permitted reserves (measured in megatonnes (Mt), or million tonnes) for land-won primary aggregates in England and Wales only. As at 31 December 2009, total permitted reserves in England and Wales were 3,982 Mt for crushed rock and 565 Mt for sand and gravel, giving a total permitted reserves figure of 4,547 Mt. To put this figure into context, total consumption of primary aggregates (including land-won, marine and imported aggregates) in England and Wales for 2009 was 119 Mt.<sup>20</sup>

*The Managed Aggregates Supply System and national minerals planning policy frameworks*

2.22 A key objective of aggregates planning policy in GB over many years has been to ensure an adequate and steady supply of aggregates to meet the needs of the construction industry with the minimum of adverse environmental impacts.<sup>21</sup> This objective was embodied in the adoption of the Managed Aggregates Supply System (MASS) in England and Wales in the late 1970s, and its implementation through national planning policy.

2.23 The MASS was established to address the long-term and persistent imbalances between the regional supply and demand across the different regions of England and Wales. In particular, the South-East, the East, Greater London and North Wales faced significant shortages of aggregates supply, whilst surpluses arose in the East Midlands and the South-West. Only the North-East and South Wales were largely

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<sup>20</sup> British Geological Survey, *United Kingdom Minerals Yearbook 2011*.

<sup>21</sup> [www.sustainableaggregates.com/overview/policy.htm](http://www.sustainableaggregates.com/overview/policy.htm).

considered to be self-contained.<sup>22</sup> Appendix 2.1, Figure 1, illustrates the interregional flows in 2009 of crushed rock aggregates for England and Wales. In Scotland, these imbalances were, and continue to be, less pronounced (given Scotland's lower consumption and higher reserves of aggregates), and as such the MASS was not adopted.<sup>23</sup>

- 2.24 The MASS was operated as a fully integrated system in England and Wales until Welsh devolution in 1998,<sup>24</sup> since when the Welsh Government has been responsible for minerals planning policy in Wales.
- 2.25 National planning policy establishes the principles through which the MASS is implemented (in England and Wales) and supports the legislative and procedural measures that determine how planning decisions are made. Responsibility for developing a national planning policy framework lies with the DCLG for England, the Welsh Government for Wales and the Scottish Government for Scotland,<sup>25</sup> whilst decisions to grant planning permissions are taken locally by the LMPAs.<sup>26</sup>
- 2.26 Whilst the MASS was not formally adopted in Scotland, the respective planning regimes in England, Wales and Scotland share a number of common features. In particular, each national planning policy framework adopts a broadly common approach in relation to the role and responsibilities of the LMPAs, in particular the surveying, identification and selection of sites; safeguarding the availability of undeveloped sites with suitable reserves of aggregates;<sup>27</sup> and assessing proposals in

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<sup>22</sup> [www.sustainableaggregates.com/overview/policy.htm](http://www.sustainableaggregates.com/overview/policy.htm).

<sup>23</sup> [www.sustainableaggregates.com/overview/policy\\_extended.htm](http://www.sustainableaggregates.com/overview/policy_extended.htm).

<sup>24</sup> [www.sustainableaggregates.com/overview/policy\\_extended.htm](http://www.sustainableaggregates.com/overview/policy_extended.htm).

<sup>25</sup> [www.bgs.ac.uk/mineralsuk/planning/legislation/home.html](http://www.bgs.ac.uk/mineralsuk/planning/legislation/home.html).

<sup>26</sup> [www.bgs.ac.uk/Planning4Minerals/CentralGovt\\_1.htm](http://www.bgs.ac.uk/Planning4Minerals/CentralGovt_1.htm).

<sup>27</sup> Safeguarding a site prevents a site with potential mineral reserves from being 'sterilized' through restricted access by other forms of surface development. Source: DCLG.

relation to how sites should be worked and operated, and subsequently restored following extraction.<sup>28</sup>

2.27 The operation of the MASS in England and Wales has a number of important characteristics, some of which are also present in Scotland (where the MASS was not formally implemented):

(a) *Security of supply and landbanks*. To meet the objective of securing an adequate and steady supply of aggregates (see paragraph 2.22 above), LMPAs in England, Wales and Scotland are encouraged by their respective national planning policies to maintain a stock of planning permissions to ensure continuity of aggregates production (landbanks).<sup>29</sup> Further details of national policy regarding landbanks and the views of main and third parties are in Appendix 2.1.

(b) *Aggregates working parties (AWPs)*. AWP were established in England and Wales (but not in Scotland) in the 1970s to provide technical advice on the supply and demand of aggregates to LMPAs, national and regional government agencies, and the aggregates industry.<sup>30</sup> There are currently 11 regional AWP, nine in England and two in Wales. These AWP are advisory rather than decision-making bodies. The Government funds the AWP Secretariat function, and the terms of reference for each AWP are agreed by the National Co-ordination Group, which is chaired by DCLG.<sup>31</sup> Further detail of the operation of AWP in England and Wales and the views of main and third parties are in Appendix 2.1.

(c) *Assessment of local aggregates demand*. In deciding what provisions to make for future aggregates supply, LMPAs need to form a view of likely local aggregates

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<sup>28</sup> British Geological Survey: *Managing aggregates supply in England, A review of the current system and future options*, 2008, Section 4.4.

<sup>29</sup> In the context of aggregates planning, a 'landbank' is defined as a stock of planning permissions (as measured in years) for permitted reserves to ensure continuity of aggregates production for a set number of years based on current extraction rates: [www.bgs.ac.uk/Planning4Minerals/Glossary.htm#landbank](http://www.bgs.ac.uk/Planning4Minerals/Glossary.htm#landbank).

<sup>30</sup> [www.communities.gov.uk/planningandbuilding/planningbuilding/planningresearch/researchreports/mineralswasteresearch/aggregateworkingparties/](http://www.communities.gov.uk/planningandbuilding/planningbuilding/planningresearch/researchreports/mineralswasteresearch/aggregateworkingparties/).

<sup>31</sup> The National Co-ordination Group is chaired by the DCLG and includes the chairs and secretaries from the AWP as well as industry trade associations and other government departments. It also includes AWP chairs and secretaries from Wales, and the National Assembly for Wales.

demand. The nature and extent of guidance offered to individual LMPAs by national governments varies between England, Scotland and Wales and is described in Appendix 2.1.

- 2.28 Further details of these aspects of national planning policy frameworks, as well as views of main and third parties on the MASS, may be found in Appendix 2.1.

*Environmental considerations in the minerals planning system*

- 2.29 The importance of balancing economic growth with the need to safeguard the environment (see paragraph 2.22) means that environmental legislation is an integral part of the aggregates planning process. EU member states are obliged to implement EU Directives and conventions into their national statutory provisions in order to ensure that there are ‘common procedural requirements’ throughout the EU.<sup>32</sup> Whilst there is no specific EU Directive for aggregates planning, the EU’s environmental Directives and conventions have had a significant influence and impact on the national planning policy framework which applies in GB.<sup>33,34</sup>

- 2.30 In particular, a number of main and third parties highlighted the EU Environmental Impact Assessment (EIA) Directive, whose implementation is the responsibility of the individual LMPAs. The EIA Directive requires developers of larger minerals development sites, and of sites expected to have a significant environmental impact, to provide an ‘Environmental Statement’ to the LMPA, which contains an assessment

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<sup>32</sup> [www.bgs.ac.uk/Planning4Minerals/EU\\_Influence\\_1.htm](http://www.bgs.ac.uk/Planning4Minerals/EU_Influence_1.htm).

<sup>33</sup> [www.bgs.ac.uk/Planning4Minerals/EU\\_Influence\\_1.htm](http://www.bgs.ac.uk/Planning4Minerals/EU_Influence_1.htm).

<sup>34</sup> The Department for Environment, Food and Rural Affairs (Defra) is the government body responsible for setting the majority of environmental policies and regulations for the whole of the UK, and it has streamlined the EU’s environmental Directives to create an environmental ‘permitting’ regime in England which governs how sites are operated. In Wales, this is a matter for the environment directorate within the Welsh Government, and in Scotland, the Scottish Government is responsible for transposing EU law into domestic legislation.

of the likely environmental effects arising from the proposed development.<sup>35</sup> Further details of the EIA Directive and parties' views about it may be found in Appendix 2.1.

### *Marine aggregates and the licensing regimes for the dredging of marine aggregates*

- 2.31 The activity of extracting marine aggregates from the seabed is referred to as 'aggregates dredging'. Marine aggregates account for around 20 per cent of the total supply of sand and gravel in England and Wales.<sup>36</sup>
- 2.32 Dredging is carried out by a dredging vessel (dredger) which can either operate while stationary (anchored during dredging) or while in motion by towing a 'drag head'.<sup>37</sup> Each dredger transports marine aggregates from dredge sites direct to the marine wharves, which are typically located close to the point of end-use.<sup>38</sup>
- 2.33 A marine wharf is used to land marine aggregates which have been dredged. Wharves require a quay, a discharge area and typically a processing plant to screen the aggregates and remove impurities. In some cases, an RMX plant might also be co-located at a wharf. The construction of a marine wharf requires planning permission from the LMPA, with most wharves located in the Thames Estuary, the South Coast, the Bristol Channel, and the north-east coast of England. There are also wharves in the North-West of England and North Wales.
- 2.34 Various licences and other permissions are required in order to engage in aggregates dredging within UK waters:

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<sup>35</sup> [www.bgs.ac.uk/mineralsuk/planning/legislation/home.html](http://www.bgs.ac.uk/mineralsuk/planning/legislation/home.html).

<sup>36</sup> MPA website ([www.mineralproducts.org/iss\\_key01.htm#](http://www.mineralproducts.org/iss_key01.htm#)).

<sup>37</sup> [www.sustainableaggregates.com/overview/policy\\_extended.htm](http://www.sustainableaggregates.com/overview/policy_extended.htm). Hanson told us that no UK registered dredging vessels had capacity exceeding 8 kilotonnes (kt) of marine aggregates, and that the average cargo capacity of its own marine fleet was around 4 kt per dredger (ranging from 1.2 to 8 kt).

<sup>38</sup> *Marine Aggregate Dredging: Helping to determine good practice*, September 2006. See also previous footnote.

- (a) Before making an application for permission to dredge in a particular area of the seabed, a marine aggregates producer must first be awarded exploration and option rights by The Crown Estate through a tender process.<sup>39</sup>
- (b) A Marine Licence (effectively an environmental consent)<sup>40</sup> is required to carry out dredging within UK waters.<sup>41</sup> A Marine Licence permits dredging in a particular area of the seabed. Three Marine Licensing Authorities are responsible for granting Marine Licences to marine aggregates producers.<sup>42</sup> In some cases, a Marine Licence may be required if a British vessel operates outside UK territorial waters.
- (c) Once a Marine Licence has been granted, the marine aggregates producer can only commence dredging operations once it also receives a commercial dredging licence, also known as a 'Production Agreement', from The Crown Estate.<sup>43</sup>

2.35 Further details of the licensing regimes for the dredging of marine aggregates may be found in Appendix 2.1

### *Secondary and recycled aggregates and the applicable planning regimes*

2.36 Unprocessed feedstock for secondary and recycled aggregates is classified as 'waste' and therefore the sites which process the feedstock into aggregates operate under waste management regulations which are enforced by the Environment Agency (EA). Once processed, secondary and recycled aggregates are no longer classified as 'waste', and are regulated by the applicable planning permission.<sup>44</sup> In addition, the supply of feedstock for secondary and recycled aggregates is also affected by the 'Landfill Tax', which provides a financial incentive to waste producers to recycle more of their waste materials, rather than disposing of them in landfills.

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<sup>39</sup> MPA website: [www.mineralproducts.org/documents/brochure.pdf](http://www.mineralproducts.org/documents/brochure.pdf).

<sup>40</sup> [www.bmapa.org/what\\_licence01.php](http://www.bmapa.org/what_licence01.php).

<sup>41</sup> [www.marinemanagement.org.uk/licensing/documents/guidance/03.pdf](http://www.marinemanagement.org.uk/licensing/documents/guidance/03.pdf).

<sup>42</sup> [www.marinemanagement.org.uk/licensing/documents/guidance/03.pdf](http://www.marinemanagement.org.uk/licensing/documents/guidance/03.pdf).

<sup>43</sup> [www.marinemanagement.org.uk/licensing/documents/guidance/03.pdf](http://www.marinemanagement.org.uk/licensing/documents/guidance/03.pdf).

<sup>44</sup> [www.sustainableaggregates.com/sourcesofaggregates/recycled/rib\\_operation.htm](http://www.sustainableaggregates.com/sourcesofaggregates/recycled/rib_operation.htm).

The Landfill Tax is levied on waste producers for each tonne of waste disposed of in landfills.<sup>45</sup>

- 2.37 The waste materials that constitute the feedstock for the production of recycled materials must be processed, eg crushed and screened, to produce the final product, using either a mobile or fixed recycling plant.<sup>46</sup> Fixed recycling plants are generally situated in industrial areas or co-located at a primary aggregates site. Fixed recycling plants require both a planning permission and an environmental permit, whilst a mobile recycling plant requires an environmental permit depending on the category of the plant.<sup>47</sup> Further details of the licensing regimes for secondary and recycled aggregates may be found in Appendix 2.1.

### *The aggregates levy*

- 2.38 On 1 April 2002, the Government introduced a levy on sand, gravel and rock that were 'commercially exploited' in the UK (the aggregates levy). HM Treasury told us that the aggregates levy was aimed at:
- (a) internalizing some of the externalities from quarrying, such as dust, noise, visual intrusion and loss of biodiversity; and
  - (b) introducing a price incentive to encourage the use of waste, spoil and recycled aggregates by relieving them from the aggregates levy.<sup>48</sup> In other words, the aggregates levy is not payable on waste, spoil and recycled aggregates.
- 2.39 HM Treasury told us that the aggregates levy charge arose when aggregates became subject to 'commercial exploitation'<sup>49</sup> and that it was payable by the person

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<sup>45</sup> The standard rate is currently £64 per tonne for 2011/12, which will increase to £72 for 2012/13 and £80 for 2013/14. A lower rate applies (£2.50 per tonne) for the use of waste for filling or restoring quarries. Whilst the feedstock that goes into secondary and recycled aggregates is defined as 'waste' for the EA's purposes, it is not 'waste' for the purposes of the Landfill Tax until it is disposed of in landfills: [www.businesslink.gov.uk/bdotg/action/detail?itemId=1085288287&type=RESOURCES#](http://www.businesslink.gov.uk/bdotg/action/detail?itemId=1085288287&type=RESOURCES#).

<sup>46</sup> [www.sustainableaggregates.com/sourcesofaggregates/recycled/rib\\_introduction.htm](http://www.sustainableaggregates.com/sourcesofaggregates/recycled/rib_introduction.htm).

<sup>47</sup> [www.sustainableaggregates.com/sourcesofaggregates/recycled/rib\\_operation.htm](http://www.sustainableaggregates.com/sourcesofaggregates/recycled/rib_operation.htm).

<sup>48</sup> [www.sustainableaggregates.com/overview/policy\\_extended.htm](http://www.sustainableaggregates.com/overview/policy_extended.htm).

responsible for subjecting the aggregates to ‘commercial exploitation’ rather than the user (although the amount of levy payable might be taken into account in the producer’s selling price). The aggregates levy is also incurred on imported primary aggregates when they are first ‘commercially exploited in the UK’ and not when they are imported. To maintain the international competitiveness of UK primary aggregates, the aggregates levy is not payable on UK aggregates which are exported.<sup>50</sup>

2.40 The aggregates levy was set at £1.60 per tonne when the levy was introduced on 1 April 2002, and increased to £1.95 per tonne on 1 April 2008 and £2.00 per tonne on 1 April 2009. HM Treasury told us that these increases were intended to reflect inflation, and that a further planned increase to £2.10 per tonne had been deferred until 2013 at the earliest. Annual tax revenues generated from the aggregates levy are around £300–£350 million.<sup>51</sup>

2.41 Further details of the operation of the aggregates levy and the views of some main parties may be found in Appendix 2.1.

## **Cement**

2.42 The following paragraphs cover:

- (a) the different types of cement and how they are produced;
- (b) how total GB demand for cement has varied over the last ten years;
- (c) the EU ETS for CO<sub>2</sub> emissions;
- (d) the UK Carbon Reduction Commitment Energy Efficiency Scheme;
- (e) the UK Climate Change Agreements (CCAg); and

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<sup>49</sup> A quantity of aggregates is subjected to ‘exploitation’ if: (a) it is removed from: its originating site; a connected site registered under the same name; or a site where it was intended to be subject to an exempt process but in fact was not; (b) it is subject to an agreement to supply, ie it was sold; (c) it is used for construction purposes, eg to build roads; or (d) it is mixed with anything other than water, eg to make concrete.

<sup>50</sup> [www.bgs.ac.uk/mineralsuk/planning/legislation/home.html](http://www.bgs.ac.uk/mineralsuk/planning/legislation/home.html).

<sup>51</sup> [www.sustainableaggregates.com/overview/policy\\_extended.htm](http://www.sustainableaggregates.com/overview/policy_extended.htm).

(f) the UK Climate Change Levy (CCL).

2.43 We return to items (c) to (f) in Section 7 (as part of our competitive assessment of the supply of cement in GB) and Section 11 (as part of our assessment of the impact on competition of policy and regulation). Where necessary, further details are provided in Appendix 2.2.

### *Description of products*

2.44 Cement is the 'glue' that binds together the components of building materials. Among other uses, cement is mixed with aggregates and water to produce RMX. Cement is made from a mixture of finely ground limestone or chalk (or other materials with a high calcium content), clay and sand (or other sources of silica and alumina). This mixture is heated almost to melting point (around 1,450°C) in a large rotating kiln, creating an intermediate product, cement clinker, which has specific chemical proportions of lime, alumina, silica and iron. The finished cement is produced by grinding together around 95 per cent cement clinker with 5 per cent additives including gypsum<sup>52</sup> to produce a fine powder. When cement is mixed with water, the hydration of calcium silicates and aluminates causes the cement to set.

2.45 Cement may be grey or white in colour. White cement is similar to grey cement in many respects except for its colour. Obtaining this colour requires substantial modification to the method of manufacture, and because of this, it is considerably more expensive than the grey product. White cement is not produced in the UK, and previously has not been considered part of the same relevant product market as grey

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<sup>52</sup> A very soft mineral composed of calcium sulphate dihydrate. The addition of gypsum helps to control the time taken for the cement to harden when water is added. Anhydrite (anhydrous calcium sulphate) may also be used.

cement.<sup>53</sup> Throughout this report, we use the term ‘cement’ to refer to grey cement only.

- 2.46 As well as being an input into RMX, cement is an input into (among other building products) the production of concrete and concrete products. Concrete products include concrete blocks and precast concrete products.<sup>54</sup>
- 2.47 Cement is supplied in bulk or bagged. Bagging can take place either at a cement production plant, or at a depot or import terminal, where facilities exist. Bulk cement may reach the customer by bulk road tanker or very rarely by bulk rail tanker. Bagged cement is distributed to customers using ordinary lorries.
- 2.48 Figure 2.2 shows the locations of the Majors’ operational cement plants (including grinding/blending plants, and grinding, packing and distribution plants) in the UK as at 2012. Over the period 2007 to 2011, there were two further cement plants in operation: Cemex’s Barrington in Cambridgeshire (closed in 2008) and Lafarge’s Northfleet just to the east of Greater London (closed in 2008). Several kilns have also been mothballed over this period ([]), but this did not change the geographical footprint of the Majors’ cement operations.

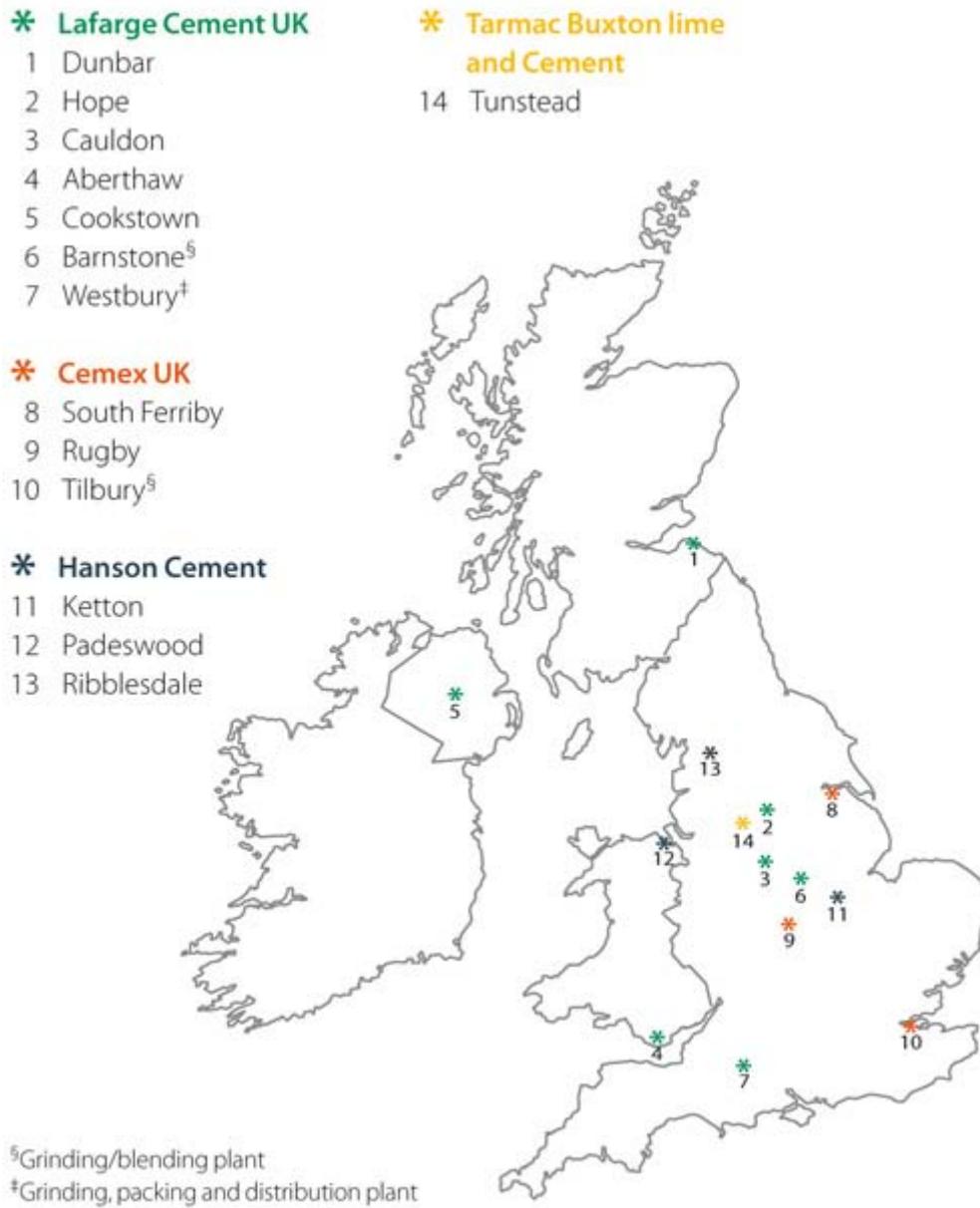
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<sup>53</sup> See the OFT’s decision in Lafarge Cement UK/Port Land Cement Company Ltd, 2005.

<sup>54</sup> Concrete blocks are prefabricated building blocks made out of concrete. Precast concrete products are concrete structures produced by casting concrete in a reusable mould or form which is then cured in a controlled environment and transported to a specific construction site to be lifted into place.

FIGURE 2.2

**Map of the Majors' cement plants in the UK, 2012**



Source: MPA website:  
[http://cement.mineralproducts.org/cement/manufacture/location\\_of\\_mpa\\_members\\_cement\\_plants.php](http://cement.mineralproducts.org/cement/manufacture/location_of_mpa_members_cement_plants.php).

## *Cementitious products*

2.49 Different types of cement are produced by blending ground clinker with other materials. In this report, we refer to these materials collectively as ‘cementitious products’.<sup>55</sup> The materials include:

- (a) *GGBS*, a by-product of the blast furnaces used to make iron (which is part of the steel-making process). Paragraph 7.112 describes the companies involved in GGBS production in GB. GGBS is a cementitious material, which means that it is (like ground clinker) capable of a hydraulic reaction with water to form a solid crystalline structure. On its own it would develop strength extremely slowly. It is normally blended with ground clinker to produce a product that strengthens more quickly (albeit not as quickly as ground clinker on its own). Performance of concretes manufactured using clinker and GGBS is normally consistent and predictable.
- (b) *PFA*, a by-product of pulverized fuel (typically coal)-fired power stations. Paragraph 7.118 describes the companies involved in PFA production in GB. It consists of very fine particles of silica. PFA is a pozzolanic material, which means that it is capable of reactions to form solid crystalline structures (as for a cementitious material) but only in the presence of an alkaline environment. PFA is more variable in its properties and ‘compatibility’<sup>56</sup> with different cements than GGBS.
- (c) *Limestone*, which has almost no cementitious properties, but it is used (a) in the production of the cement clinker itself; (b) as a minor additional constituent in the production of all cement types, when clinker is ground to produce cement; and (c) as an additive in the production of blended limestone cement, in which it is used to replace some clinker.

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<sup>55</sup> We use the term ‘cementitious products’ for ease of reference in this report, although these materials vary in the extent to which they are cementitious (which refers to being capable of a hydraulic reaction with water to form a solid crystalline structure).

<sup>56</sup> The chemistry of the cement can be varied to increase its compatibility with PFA.

2.50 Cement types (also known as blended cements) are defined by strength development and setting times, which are determined by the proportions and nature of the different raw cementitious products used to make that particular cement type, as shown in Table 2.1. CEM I is the basic, and the most widely produced, cement in GB. CEM II and CEM III are the other two main types of cement supplied in the UK.

TABLE 2.1 **Types of cement for concrete (BS EN 197-1) and typical uses**

<i>Type</i>	<i>Ingredients</i>	<i>Typical uses</i>
CEM I	Clinker and up to 5% additives	RMX; precast concrete; as a base for formulated products, eg grouts cement-based floor and tile adhesives; mortars and screeds; and site-mixed concrete
CEM II	Clinker and between 6% and 35% other single constituents, eg PFA, GGBS, limestone	RMX; general concreting; ground engineering; and soil stabilization
CEM III	Clinker and >35% GGBS	RMX
CEM IV	Clinker and >35% pozzolana/PFA	
CEM V	Clinker and >35% GGBS and pozzolana/PFA	

Source: British Geological Survey (2005), [Mineral Profile: Cement Raw Materials](#) and Anglo American.

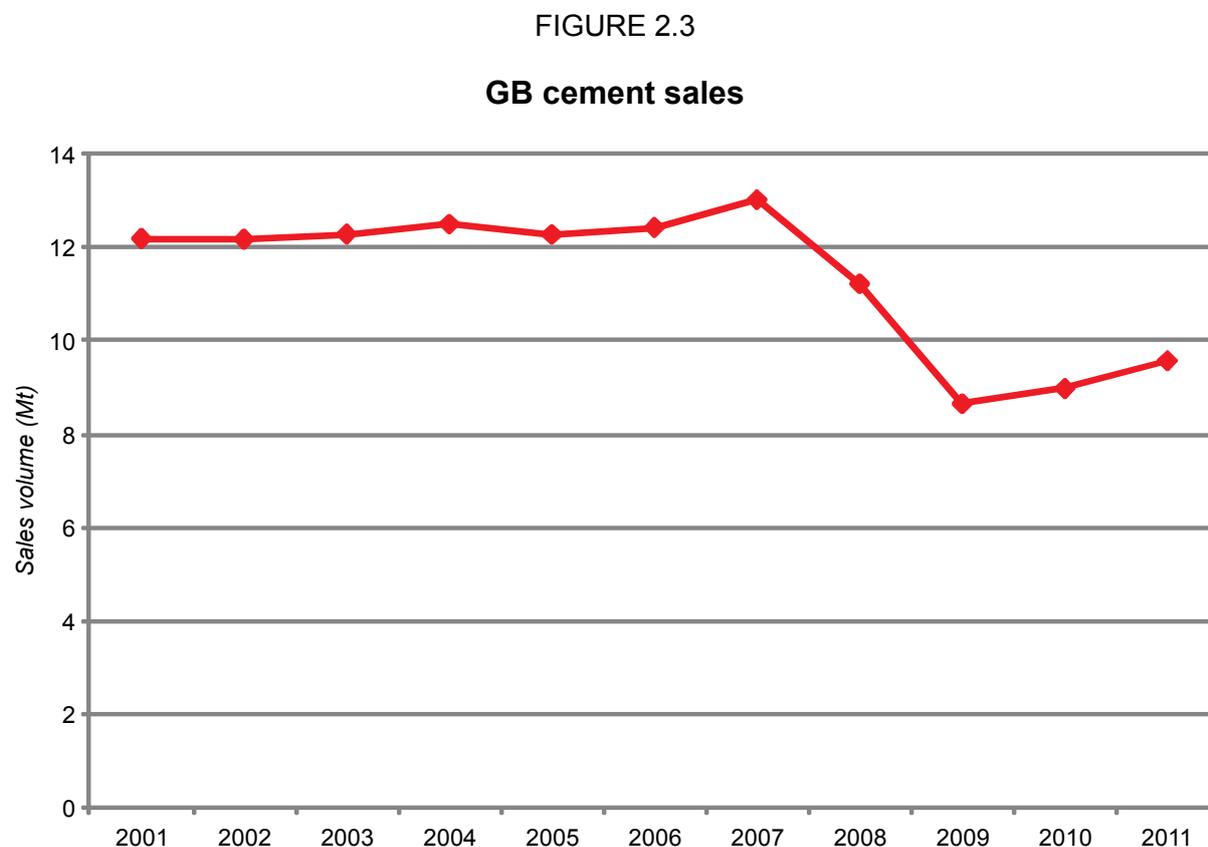
2.51 Blended cements are produced because they tend to be cheaper than CEM I, because they have a lower carbon footprint<sup>57</sup> and because they can impart certain beneficial characteristics to the cement (such as sulphate resistance).

2.52 Any cement works which has milling, blending and storage facilities for additives can produce different types of cement. As an alternative to buying bulk CEM II and CEM III, which are blended at the production site, some customers may buy CEM I and additives, such as GGBS or PFA, separately and mix these directly at their own sites (either using their own blending and storage facilities, or by using their RMX plants to mix together the required quantities of materials to produce the RMX specification desired).

<sup>57</sup> Clinker manufacture is very energy intensive, and generates around 0.8 tonnes of CO<sub>2</sub> for each tonne of clinker produced, including the energy derived from the fuels used to heat the kiln. Therefore the clinker content of cement is a key factor driving its cost and its CO<sub>2</sub> emissions profile. Blended cements are also known as 'low carbon cements'.

## Demand for cement in GB

2.53 Figure 2.3 shows total GB cement sales over the period 2001 to 2011. A significant downturn in sales (a decline of 36 per cent) over the period 2007 to 2009 can be seen, coinciding with the UK recession.



Source: MPA.

## EU Emissions Trading Scheme

2.54 The EU ETS is a 'cap-and-trade' carbon trading system designed to limit and reduce the greenhouse gas emissions produced by its energy-intensive industry sectors and electricity generators (ETS sectors), including the production of cement clinker,<sup>58</sup> where carbon emissions are both a by-product of the chemical process by which clinker is created and the result of the burning of fossil fuels during the production

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<sup>58</sup> The ETS covers the electricity generation and major energy-intensive sectors, including power stations, iron and steel, clinker and lime. Clinker is used in the manufacture of cement. Source: [www.gov.uk/government/policies/reducing-the-uk-s-greenhouse-gas-emissions-by-80-by-2050/supporting-pages/eu-emissions-trading-system-eu-et](http://www.gov.uk/government/policies/reducing-the-uk-s-greenhouse-gas-emissions-by-80-by-2050/supporting-pages/eu-emissions-trading-system-eu-et). ETS sector coverage has gradually increased to include other sectors, such as gypsum and integrated steelworks, under ETS Phase II. Source: [www.gov.uk/participating-in-the-eu-ets#eu-ets-phase-ii-2008-to-2012](http://www.gov.uk/participating-in-the-eu-ets#eu-ets-phase-ii-2008-to-2012).

process.<sup>59</sup> The ETS covers around 40 per cent of the EU's total greenhouse gas emissions and around half of its total carbon emissions.<sup>60</sup>

- 2.55 The ETS currently operates in 31 countries (in all 27 EU member states and, since the start of 2008, in all three EEA-EFTA (European Economic Area European Free Trade Association) states, namely Iceland, Liechtenstein and Norway, and Croatia<sup>61</sup> from 1 January 2013).<sup>62</sup> The ETS forms one of the EU's key policies for meeting its commitment under the 1997 Kyoto Protocol to reduce its greenhouse gas<sup>63</sup> emissions to 8 per cent below 1990 levels by the end of the first Kyoto Protocol commitment period (2008 to 2012).<sup>64</sup>
- 2.56 Following the introduction of the EU Emissions Trading Directive in 2003,<sup>65</sup> the ETS commenced the first of its three 'trading phases' (ETS Phase I),<sup>66</sup> which lasted from 1 January 2005 to 31 December 2007. The second trading phase (ETS Phase II) commenced on 1 January 2008 and ended on 31 December 2012. The ETS is currently in its third trading phase (ETS Phase III), which commenced on 1 January 2013 and will end on 31 December 2020.<sup>67</sup> By the end of ETS Phase III, overall carbon emissions from ETS installations are expected to reduce to 21 per cent below 2005 levels.<sup>68</sup> The ETS will continue to operate beyond 2020.
- 2.57 Each member state is responsible for administering the ETS for its own ETS sectors. In the UK, this responsibility is discharged by the Department for Energy and Climate

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<sup>59</sup> [www.ipcc-nggip.iges.or.jp/public/gp/bgp/3\\_1\\_Cement\\_Production.pdf](http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/3_1_Cement_Production.pdf).

<sup>60</sup> [www.environment-agency.gov.uk/business/topics/pollution/141019.aspx](http://www.environment-agency.gov.uk/business/topics/pollution/141019.aspx).

<sup>61</sup> Whilst Croatia will become an EU member state on 1 July 2013, its participation in the ETS commenced on 1 January 2013.

<sup>62</sup> [http://ec.europa.eu/clima/policies/ets/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/index_en.htm).

<sup>63</sup> The EU Emissions Trading Directive covered the six greenhouse gases (including carbon dioxide, which is the principal greenhouse gas) which were included in the Kyoto Protocol. Sources: [www.doeni.gov.uk/niea/eu-ets-guidance01.pdf](http://www.doeni.gov.uk/niea/eu-ets-guidance01.pdf) and [http://unfccc.int/kyoto\\_protocol/mechanisms/emissions\\_trading/items/2731.php](http://unfccc.int/kyoto_protocol/mechanisms/emissions_trading/items/2731.php).

<sup>64</sup> [www.environment-agency.gov.uk/business/topics/pollution/32232.aspx](http://www.environment-agency.gov.uk/business/topics/pollution/32232.aspx).

<sup>65</sup> [www.gov.uk/eu-ets-legislation-and-research-publications](http://www.gov.uk/eu-ets-legislation-and-research-publications).

<sup>66</sup> [http://ec.europa.eu/clima/policies/ets/allocation/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/allocation/index_en.htm).

<sup>67</sup> [http://ec.europa.eu/clima/policies/ets/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/index_en.htm).

<sup>68</sup> [http://ec.europa.eu/clima/policies/package/index\\_en.htm](http://ec.europa.eu/clima/policies/package/index_en.htm).

Change (DECC) and the three devolved administrations, namely the respective Governments of Scotland, Wales and Northern Ireland.

- 2.58 Prior to the commencement of each of ETS Phases I and II, each member state was responsible for publishing its 'National Allocation Plan', a document which set out:
- (a) a national 'cap' on the total amount of 'EU Allowances' or 'EUAs' (carbon allowances) during each relevant trading phase,<sup>69</sup> and
  - (b) the methodology by which the cap would be allocated to the different ETS sectors and their individual installations.<sup>70</sup> Each member state's cap contributed to an overall EU cap on carbon emissions, where one carbon allowance must be surrendered to account for 1 tonne of carbon emitted. These carbon allowances, which were available free, were then distributed by each member state to its ETS installations. A proportion of the carbon allowances were also placed in a 'New Entrant Reserve' (NER) and some were available for auctioning by the member state.<sup>71</sup> Further details on the NER are set out in Appendix 2.2.
- 2.59 Under ETS Phase III, many of these decisions are now determined at an EU level,<sup>72</sup> and the system of National Allocation Plans will be replaced by a centralized EU-wide cap on carbon emissions, with allocations for all installations made according to harmonized EU rules and set out in each member state's 'National Implementation Measures'.<sup>73</sup> The EU-wide cap for the start of ETS Phase III was set at around 2 billion tonnes of carbon emissions (or 2 gigatonnes (Gt) CO<sub>2</sub>),<sup>74</sup> which will decline linearly each year, such that by 2020 the EU would deliver an overall reduction of its

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<sup>69</sup> [www.environment-agency.gov.uk/business/topics/pollution/141019.aspx](http://www.environment-agency.gov.uk/business/topics/pollution/141019.aspx).

<sup>70</sup> [www.decc.gov.uk/assets/decc/What%20we%20do/Global%20climate%20change%20and%20energy/Tackling%20Climate%20Change/Emissions%20Trading/eu\\_ets/phase%20iii/1016-euets-preparing-phase-III.pdf](http://www.decc.gov.uk/assets/decc/What%20we%20do/Global%20climate%20change%20and%20energy/Tackling%20Climate%20Change/Emissions%20Trading/eu_ets/phase%20iii/1016-euets-preparing-phase-III.pdf).

<sup>71</sup> [www.environment-agency.gov.uk/business/topics/pollution/141025.aspx](http://www.environment-agency.gov.uk/business/topics/pollution/141025.aspx).

<sup>72</sup> [www.decc.gov.uk/assets/decc/What%20we%20do/Global%20climate%20change%20and%20energy/Tackling%20Climate%20Change/Emissions%20Trading/eu\\_ets/phase%20iii/1016-euets-preparing-phase-III.pdf](http://www.decc.gov.uk/assets/decc/What%20we%20do/Global%20climate%20change%20and%20energy/Tackling%20Climate%20Change/Emissions%20Trading/eu_ets/phase%20iii/1016-euets-preparing-phase-III.pdf).

<sup>73</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:130:FULL:EN:PDF>.

<sup>74</sup> [http://ec.europa.eu/clima/policies/ets/cap/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/cap/index_en.htm).

carbon emissions to 21 per cent below 2005 levels, with a cap of around 1.7 billion tonnes of carbon emissions (1.7 Gt CO<sub>2</sub>).<sup>75</sup>

2.60 ETS Phase III has brought about the following major changes to the system compared with ETS Phases I and II:

(a) *Product benchmarking approach.* Under ETS Phase III, carbon allowances will either be auctioned or distributed free of charge. In relation to the latter, each eligible installation will receive its free allocation based on a combination of its historic activity levels and an EU 'benchmark' of 'carbon efficiency' for the production of a particular product, eg clinker. This represents a move away from the previous 'grandfathering' approach adopted under ETS Phases I and II.

(b) *Carbon leakage.* Certain sectors and subsectors which are deemed by the European Commission to be at 'significant risk' of 'carbon leakage',<sup>76</sup> including cement production, will continue to receive 100 per cent of their benchmark allocations free during 2013 and 2014; those sectors and subsectors not considered at risk will receive 80 per cent of their benchmark allocation in 2013, declining to 30 per cent by 2020. In 2014 and 2019, the list of sectors and subsectors deemed to be at 'significant risk' of carbon leakage will be reviewed. At these review points, sectors and subsectors can be added to or removed from the list depending on whether the sector or subsector meets the criteria and thresholds set in the ETS Directive.

(c) *Auction process.* Carbon allowances which are not freely distributed will be auctioned, including 100 per cent auctioning to the power sector in the UK.<sup>77</sup>

During the course of ETS Phase III, the proportion of carbon allowances which

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<sup>75</sup>[http://webarchive.nationalarchives.gov.uk/20121025080026/http://www.decc.gov.uk/en/content/cms/emissions/eu\\_ets/phase\\_iii/phase\\_iii.aspx](http://webarchive.nationalarchives.gov.uk/20121025080026/http://www.decc.gov.uk/en/content/cms/emissions/eu_ets/phase_iii/phase_iii.aspx).

<sup>76</sup> The European Commission describes 'carbon leakage' as the prospect of an increase in global greenhouse gas emissions when companies shift production outside the EU because they cannot pass on the cost increases induced by the ETS to their customers without significant loss of market share. Source:

[http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52012XC0605\(01\):EN:NOT](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52012XC0605(01):EN:NOT).

<sup>77</sup> Article 10 of ETS Directive 2003/87/EC:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2003L0087:20090625:EN:PDF>.

will be auctioned will increase marginally, with the result that marginally fewer carbon allowances will be distributed free of charge.

(d) *Small emitter exemptions.* An opt-out clause for 'small emitters' and hospitals from ETS Phase III.

(e) *New entrant reserve and carbon allowances for new entrants.* Under ETS Phase III, 5 per cent of all free carbon allowances has been set aside in an NER for new installations, including capacity extensions to existing plants, which commence operations after 30 June 2011.<sup>78</sup> If the NER is exhausted, new installations will be required to purchase any carbon allowances they require.<sup>79</sup>

2.61 Further details of the EU ETS, including the views of main and third parties, can be found in Appendix 2.2.

### *The Carbon Reduction Commitment Energy Efficiency Scheme*

2.62 The Carbon Reduction Commitment (CRC) is a government scheme which started in April 2010<sup>80</sup> to improve energy efficiency for large organizations whose electricity consumption exceeds 6,000 MWh.<sup>81</sup>

2.63 The CRC does not apply to those carbon emissions that are already covered by the ETS,<sup>82</sup> and therefore excludes cement producers in the UK. However, the CRC does cover large aggregates sites. Cemex told us that only an operator which extracted more than around 1 Mt of aggregates each year would be likely to exceed this energy consumption threshold and be covered by the CRC.<sup>83</sup> Tarmac noted that the CRC covered 'non-residual fuel sources for all operations within a qualifying organization', and therefore Cemex's example would 'only hold true for a standalone operation'.

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<sup>78</sup> DECC initial submission, 10 April 2012.

<sup>79</sup> Hanson response to the issues statement, Section 12, fn 105.

<sup>80</sup> MPA, *Policy Briefing: Energy Carbon Taxes and Market Mechanisms*, August 2011.

<sup>81</sup> DECC initial submission, 10 April 2012.

<sup>82</sup> MPA, *Policy Briefing: Energy Carbon Taxes and Market Mechanisms*, August 2011.

<sup>83</sup> Cemex response to the issues statement, 24 April 2012, Section 8.

Tarmac added that there was 'no de-minimis consumption threshold within a registered participant and so carbon consumption at all operations, even the smallest aggregates sites, must be declared and, unless exempt, will contribute to the requirements to purchase allowances'.

- 2.64 The CRC operates as a UK-wide 'emissions trading' scheme and requires each participating organization to:
- (a) report its energy consumption to the EA, which is then converted into carbon emissions;<sup>84</sup> and
  - (b) purchase allowances from the Government to cover its emissions for the previous year.<sup>85</sup> In the first year of the scheme, there was no requirement for participants to buy allowances.<sup>86</sup> However, purchases of allowances must be made for emissions generated in the second year of the scheme (from April 2011 to March 2012),<sup>87</sup> for which period the price for an allowance was £12 per tonne of carbon emitted.<sup>88</sup>
- 2.65 Each organization's energy efficiency performance is then published and ranked in a league table.<sup>89</sup> In its 2012 Autumn Statement, the Government stated that it would simplify the CRC from 2013 in order to provide 'significant administrative savings for businesses in the scheme'. It proposed that the CRC league table would be abolished, a full review of the effectiveness of the CRC would be held in 2016 and that 'when public finances allow', the tax would be a 'high priority for removal'.<sup>90</sup>

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<sup>84</sup> DECC initial submission, 10 April 2012.

<sup>85</sup> DECC initial submission, 10 April 2012.

<sup>86</sup> Cemex response to the issues statement, 24 April 2012, Section 8.

<sup>87</sup> Cemex response to the issues statement, 24 April 2012, Section 8.

<sup>88</sup> DECC initial submission, 10 April 2012.

<sup>89</sup> DECC initial submission, 10 April 2012.

<sup>90</sup> The Government's 2012 Autumn Statement, paragraph 1.127:

[http://cdn.hm-treasury.gov.uk/autumn\\_statement\\_2012\\_complete.pdf](http://cdn.hm-treasury.gov.uk/autumn_statement_2012_complete.pdf).

2.66 In relation to compliance costs, DECC told us that CRC participants incurred administrative costs (eg through reporting) and the cost of purchasing allowances.<sup>91</sup> Cemex told us that the cost of purchasing allowances was considerable, and estimated that had Cemex been required to pay for allowances in the first year of the CRC, it would have paid around £2 million, based on its total carbon emissions of around 176 kt at an assumed carbon price of £12 per tonne (the applicable price for the second year of the CRC). Cemex estimated that it would spend a similar amount on allowances for the 12 months to March 2012.<sup>92</sup>

### *UK Climate Change Agreements*

2.67 A CCAg is a voluntary agreement entered into with the Government by a sector. Under a sector 'umbrella agreement', any operator (that meets the eligibility criteria) in certain energy-intensive industries can enter the sector agreement. Participation in a sector CCAg by an operator requires the operator to have an 'underlying' CCAg with the Government.

2.68 The cement/clinker, slag grinding (eg GGBS) and lime production sectors have all entered into CCAgs with the Government.

2.69 A CCAg sets out agreed targets for improvements in the operator's energy efficiency. Once these targets are met, the operator will benefit from a discount on its climate change levy (CCL) (see paragraph 2.72) of up to 65 per cent from April 2011 (prior to which the discount was 80 per cent). The Government announced in its 2011 Autumn Statement that the discount for electricity would be increased to 90 per cent from April 2013.<sup>93</sup>

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<sup>91</sup> DECC initial submission, 10 April 2012.

<sup>92</sup> Cemex response to the issues statement, 24 April 2012, Section 8.

<sup>93</sup> [www.hm-treasury.gov.uk/d/ccl\\_electricity\\_and\\_metal.pdf](http://www.hm-treasury.gov.uk/d/ccl_electricity_and_metal.pdf).

## *Overlaps between CRC and CCAgs*

- 2.70 There are certain overlaps between the CRC and CCAgs such that if over 25 per cent of an organization's emissions are covered by a CCAg, it will be exempt from certain aspects of the CRC, including the requirement to purchase allowances.<sup>94</sup> This is known as a 'CCAgs exemption' to the CRC.
- 2.71 As explained in paragraph 2.68, CCAgs cover (among other sectors) the cement, GGBS and lime producers. Aggregates producers are, however, not covered by a CCAg. DECC told us that this could result in 'differential impacts' within the regulated sector, such that an integrated aggregates and cement producer which had a CCAg would be exempt from the CRC, but a stand-alone aggregates company would have to comply with the CRC in full. DECC told us that it was currently in the process of simplifying the CRC, including changes to the current 'CCAgs exemption' rules,<sup>95</sup> with the possibility that the CRC could be replaced by another form of environmental tax.<sup>96</sup>

## *Climate Change Levy*

- 2.72 The CCL was introduced to help the UK meet its national commitment under the Kyoto Protocol, and is a levy on the use of energy in industry, commerce and the public sector, where power consumption exceeds 2,000 kWh. The CCL is collected by the electricity supplier.

## **RMX**

- 2.73 The following paragraphs include:
- (a) a description of RMX and related products; and

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<sup>94</sup> DECC initial submission, 10 April 2012.

<sup>95</sup> DECC initial submission, 10 April 2012.

<sup>96</sup> Cemex response to the issues statement, 24 April 2012, Section 8.

(b) a chart showing how GB demand for RMX has varied over the last 10 years.<sup>97</sup>

### *Description of products*

- 2.74 RMX is concrete that is produced in a freshly mixed and unhardened state. RMX is manufactured by mixing highly specific quantities of cement and (if desired) other cementitious products with fine aggregates and coarse aggregates, water and other additives. The specific composition (and resulting properties) of RMX can be customized to suit different applications.
- 2.75 RMX can be produced (a) in a fixed plant and distributed to site by a concrete mixer; (b) in a mobile plant at (or near) the customer site (also known as a 'site plant'); or (c) in a volumetric truck which carries the ingredients separately and mixes them on-site (also known as 'on-site batching'). Approximately 86 per cent of RMX is mixed at a dedicated plant then delivered to the customer's site, 9 per cent is supplied by volumetric trucks and 5 per cent is mixed at site plants (and supplied to the same site).<sup>98</sup>
- 2.76 Value-added RMX products (RMX VAPs) can be made by using additives and/or special production processes to develop particular properties for use in specialist applications. Examples include self-compacting RMX, coloured RMX, fast-setting RMX and waterproof RMX.

### *Demand for RMX in GB*

- 2.77 Figure 2.4 shows total GB RMX production over the period 2001 to 2011. A significant downturn in production (a decline of 39 per cent) over the period 2007 to 2009 can be seen, coinciding with the UK recession.

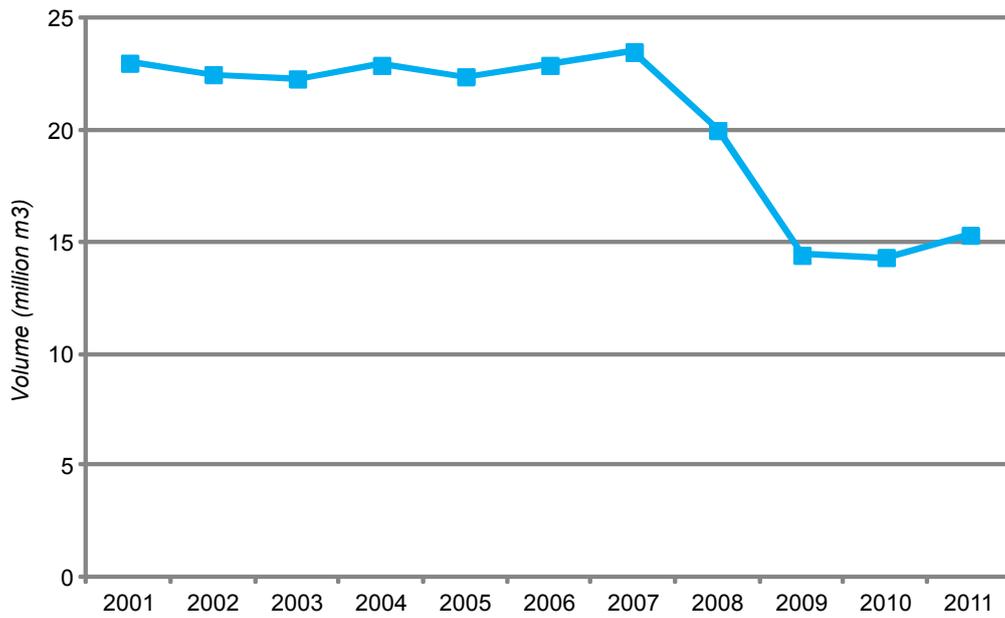
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<sup>97</sup> There were no regulations or public policies related to RMX (over and above those already discussed in the context of cement and aggregates) which we considered to be relevant to our competitive assessment for RMX.

<sup>98</sup> CC calculations based on BDS Marketing Research Ltd (BDS) 2010 data.

FIGURE 2.4

**GB RMX production**



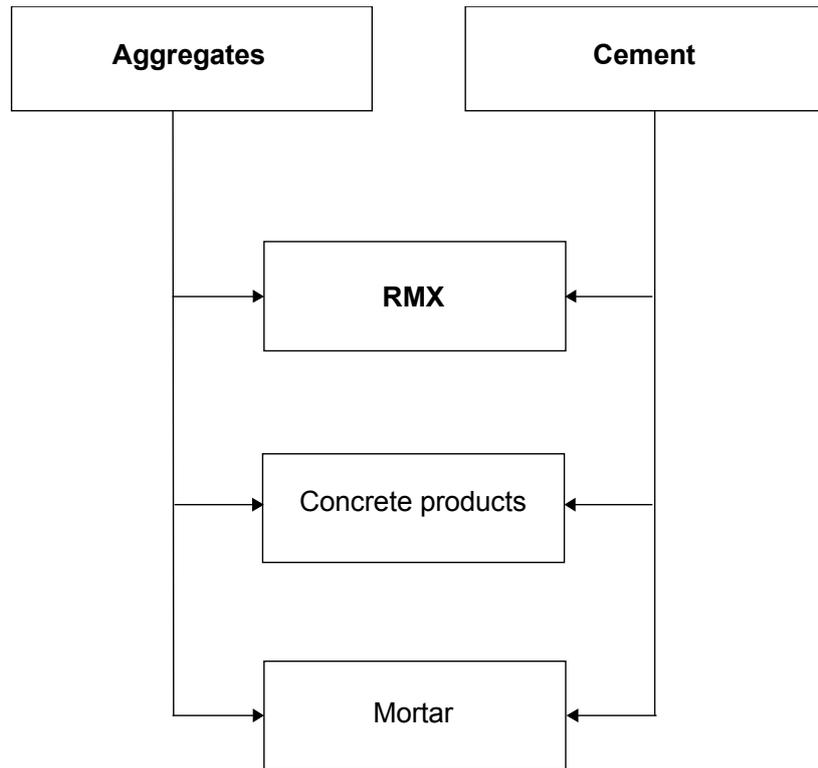
Source: MPA (February 2012).

***Input relationships between aggregates, cement and RMX and extent of vertical integration***

2.78 Figure 2.5 summarizes the input relationships between aggregates, cement and RMX, as well as showing for reference other products made from aggregates and cement.

FIGURE 2.5

**Input relationships between products**



Source: CC.

Note: Reference products are shown in bold.

2.79 There is considerable vertical integration in the industry, and this has increased over recent years. Significant proportions of the cement produced by each GB producer (ranging from around 14 per cent to around 62 per cent in 2011), and of the aggregates produced by each Major (ranging from 33 to 49 per cent), are used in their own downstream operations. However, their downstream operations are not completely self-supplied: cement and aggregates are also purchased externally.<sup>99</sup>

2.80 Some independent aggregates producers are also vertically integrated to varying degrees into RMX, concrete products and asphalt production: see Section 3.

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<sup>99</sup> Further details of the extent of internal sales and purchases of cement and aggregates are in Appendix 2.3.

### 3. Construction materials companies

#### *Introduction*

3.1 In this section, we set out brief profiles of a selection of construction materials companies operating in GB (further details can be found in Appendix 3.1). These companies account for a combined 80 per cent share of supply aggregates, 99 per cent share of supply of cement and 71 per cent share of supply of RMX in GB.<sup>1</sup> The section is structured as follows:

- (a) We first provide background information on the Majors (ie the five largest heavy building materials producers in GB) as they stood immediately prior to 7 January 2013, namely Aggregate Industries, Cemex, Hanson, Lafarge and Tarmac. We also set out short profiles of Lafarge Tarmac and HCM, two new entities which came into being on 7 January 2013 as a result of the Anglo–Lafarge JV and the implementation of the remedies required by the CC to allow that JV to proceed (see paragraph 3.34). From that date, the Majors became Aggregate Industries, Cemex, Hanson, HCM and Lafarge Tarmac. Appendix 3.2 contains a timeline showing the involvement of the parent companies of the Majors in the GB construction materials industry from 1990 to the present day.
- (b) We then set out background information on ten medium-tier independent operators<sup>2</sup> (medium-tier independents) engaged in one, or a combination, of the following activities: the production of aggregates or RMX in GB, or the importation of cement into GB.

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<sup>1</sup> These figures are volume shares of supply. The figures for aggregates and RMX are based on BDS data, and the figure for cement is based on data received from the parties.

<sup>2</sup> We broadly classified an independent aggregates or RMX operator as being 'medium-tier' if its aggregates or RMX operations met the following minimum annual production criteria: (a) 1 Mt for aggregates; or (b) 100,000m<sup>3</sup> for RMX. These thresholds were determined based on the top ten largest aggregates or RMX producers (excluding the five Majors) based on BDS 2009 data. In relation to cement importers, we approached all cement importers operating in GB. The cement importers covered in this section reflect those importers which have engaged with the CC through hearings and/or by providing responses to our information requests. Given the number of cement importers in GB, for practical reasons, we have not presented profiles of all of them. Our assessment of the competitive constraint from any particular firm, or group of firms, does not depend on whether its profile is included in this section.

- 3.2 Throughout this section, we refer to parties' activities in connection with the supply or acquisition of aggregates, cement and RMX in GB, as defined by the OFT's terms of reference of 18 January 2012, as the 'relevant GB operations'.
- 3.3 Some of the Majors produce cementitious products (eg GGBS or PFA), which are consumed in the production of blended cements (ie CEM II, CEM III and CEM IV) or in the production of certain downstream products (eg RMX and concrete products). In relation to their production of cementitious products (where applicable), this is undertaken either through wholly-owned operations (eg Hanson in the case of GGBS), or through contractual or JV arrangements (eg the ProAsh JV between Lafarge and Cemex in the case of PFA). When defining the scope of the 'relevant GB operations', we accounted for firms' production, sale or consumption of cementitious products as part of their overall RMX or blended cement production activities, rather than as a separate and stand-alone relevant GB operation. References to a financial year-end (regardless of the month in which the financial year-end falls) have been denoted by 'FY' followed by the relevant year. For example, the financial years ended 31 March 2011 or 31 December 2011 will both be denoted by FY11.

## ***The Majors***

### ***Aggregate Industries***

#### *Company overview*

- 3.4 Headquartered in Markfield, Leicestershire, Aggregate Industries is a major heavy building materials producer in GB. Its ultimate parent company is Holcim Ltd (Holcim Group), which is incorporated in Switzerland. Aggregate Industries is the main UK holding company for all of Holcim Group's operations in GB.
- 3.5 Aggregate Industries' relevant GB operations comprise its aggregates and RMX operations. Whilst it does not produce cement in GB, Aggregate Industries sources

cement and cementitious products for its downstream operations (eg RMX) from domestic producers, and it also imports cement from a Holcim Group cement works in north Germany almost exclusively for its own internal use.<sup>3</sup>

3.6 Aggregate Industries also generates substantial revenues from sales of asphalt and concrete products as well as construction services that fall outside the scope of its relevant GB operations. Table 3.1 shows the total gross revenues generated by each of its operations.

TABLE 3.1 **Aggregate Industries: FY11 gross revenues by product division**

	<i>FY11 gross revenues* £m</i>
Aggregates	[X]
RMX	[X]
Cement/GGBS imports†	[X]
Asphalt‡	[X]
Concrete Products Services§	[X]
Paving and Construction Services	[X]

Source: Aggregate Industries.

\*Gross revenues are based on both internal and external sales.

†Aggregate Industries' activities in purchasing third-party cement and cementitious products are taken into account as a procurement activity for its RMX operations and not as a separate relevant GB operation. The majority of Aggregate Industries' purchases of cement and cementitious products are used in the production activities of its downstream operations, eg RMX and concrete products.

‡Asphalt gross revenues include sales made in the Channel Islands, which are not part of GB.

§Whilst the production of both asphalt and concrete products relies on aggregates from both external and internal sources as an input, these activities are treated as being outside the scope of the relevant GB operations.

3.7 Further details of Aggregate Industries' ownership, management and operational structure may be found in Appendix 3.1.

#### *Overview of relevant GB operations and strategy*

3.8 Table 3.2 provides an overview of the total number of active sites for Aggregate Industries' relevant GB operations as at 31 December 2011 and the distribution of sites across the regions of England, and in Scotland and Wales.

<sup>3</sup> For the purposes of this section, we have treated Aggregate Industries' cement import activities as an internal procurement activity for its RMX operations and not as a separate relevant GB operation.

TABLE 3.2 **Aggregate Industries' active sites in England, Scotland and Wales**

	Aggregates						RMX		Cement		
	CR	SG	Spec	Marine	Sec	Rec	Fixed	Site	Works	Blend	Terminal
North-East	2	1	1	-	-	-	8	-	-	-	-
North-West	6	1	4	-	1	1	11	-	-	-	1
Yorkshire & the Humber	-	-	-	-	-	-	-	-	-	-	-
East Midlands	6	8	3	-	1	7	7	-	-	-	-
West Midlands	1	1	1	-	-	1	10	-	-	-	-
East of England	-	-	-	-	-	-	-	-	-	-	-
London	-	-	-	-	-	1	12	-	-	-	-
South-East	3	11	1	-	1	8	8	-	-	-	1
South-West	9	9	2	-	4	8	17	-	-	-	1
England (total)	27	31	12	-	7	26	73	-	-	-	3
Scotland	15	5	2	-	-	1	20	-	-	-	1
Wales	2	-	2	-	-	-	-	-	-	-	-
GB (total)	44	36	16	-	7	27	93	-	-	-	4

Source: Aggregate Industries.

Note: For aggregates (sites include quarries and pits, depots are excluded): CR = crushed rock; SG = sand and gravel (land-won); Spec = specialist aggregates; Marine = marine aggregates; Sec = secondary aggregates; Rec = recycled aggregates. For RMX: Fixed = fixed plants; Site = site plants.

For cement: Works = cement works; Blend = blending station; Terminal = cement import terminal.

3.9 Aggregate Industries' primary aggregates operations form the largest part of its aggregates operations. It has quarrying operations across all the regions of England (with the exception of the East of England and Yorkshire and the Humber), and in Scotland and Wales. Aggregate Industries operates a higher number of primary aggregates sites in England, in particular in the South-East, the South-West and the East Midlands, compared with its quarrying operations in Wales and Scotland.

3.10 Aggregate Industries told us that its strategy for its aggregates business [REDACTED].

3.11 In terms of RMX and cement procurement, Aggregate Industries operates in England and Scotland, but does not operate any plants in the regions of Yorkshire and the Humber and the East of England, and in Wales. Cement for its RMX production activities is sourced through its four cement import terminals: one in Scotland and three in England.

3.12 Aggregate Industries told us that before the recent recession, its strategy for RMX had been [REDACTED].

- 3.13 Further details of Aggregate Industries' relevant GB operations, including JVs and partnership arrangements, is set out in Appendix 3.1.

## *Cemex*

### *Company overview*

- 3.14 Headquartered in Thorpe, Surrey,<sup>4</sup> Cemex, formerly known as RMC (UK) Ltd, is the principal UK operating subsidiary<sup>5</sup> engaged in the production of aggregates, cement and RMX. Cemex in turn is wholly owned by Cemex UK, the UK holding company. Cemex's ultimate parent company is Cemex S.A.B de C.V. (Cemex Group), which is incorporated in Mexico.
- 3.15 Table 3.3 shows the total gross revenues generated by each of its operations, both within and outside the scope of the relevant GB operations. Activities outside the scope of the relevant GB operations include the production of asphalt, admixtures (which are used in the production of concrete and RMX) and building products.

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<sup>4</sup> Cemex response to the issues statement.

<sup>5</sup> Cemex response to the issues statement.

TABLE 3.3 **Cemex: FY11 gross revenues by product division**

	<i>FY11 gross revenues* £m</i>
Aggregates	[X]
Cement	[X]
RMX	[X]
Asphalt†	[X]
Admixtures‡	[X]
Ash and Slag§	[X]
Building products¶	[X]
Surfacing#	[X]
Dry silo mortar~	[X]
Angling★	[X]
Rentals◆	[X]

Source: Cemex.

\*Based on both internal and external sales.

†Purchases aggregates from Cemex's aggregates operations.

‡Production of admixtures for use as additives in the production of RMX and concrete and sells admixtures to Cemex's RMX operations.

§[X]

¶Includes the production of precast concrete and concrete block paving. Cemex's roof tiles business was divested in November 2011. Cemex's building products operations purchase aggregates and cement from Cemex's upstream operations and external third parties.

#The surfacing of highways, airfields and other infrastructure with asphalt.

~Produces mortar, dry silo mortar, screeds, ready-to-use, lime, sand, plaster and render. Purchases aggregates and cement from Cemex's upstream aggregates and cement operations.

★The use of restored quarries as angling sites, generating revenues via the sale of permits to anglers. Cemex told us that it was currently marketing its Angling business for divestment.

◆Rental income from sundry sites—land and buildings.

3.16 Further details of Cemex's ownership, management and operational structure may be found at Appendix 3.1.

#### *Overview of relevant GB operations and strategy*

3.17 Table 3.4 provides an overview of the total number of active sites for Cemex's relevant GB operations as at 31 December 2011 and the distribution of sites across the regions of England, and in Scotland and Wales. See also Appendix 3.1 for further details.

TABLE 3.4 Cemex's active sites in England, Scotland and Wales

	Aggregates						RMX		Cement		
	CR	SG	Spec	Marine	Sec	Rec	Fixed	Site	Works	Blend	Terminal
North-East	3	1	-	1	-	-	15	-	-	-	-
North-West	3	1	-	-	-	-	21	-	-	-	-
Yorkshire & the Humber	4	1	-	-	-	-	19	-	1	-	-
East Midlands	-	7	-	-	-	-	18	1	-	-	-
West Midlands	-	6	-	-	-	-	18	-	1	-	-
East of England	-	8	-	-	-	-	17	-	-	-	-
London	-	-	-	-	-	-	-	-	-	-	-
South-East	-	10	-	9	-	-	62	3	-	1	1
South-West	2	-	-	1	-	-	12	-	-	-	-
England (total)	12	34	-	11	-	-	182	4	2	-	1
Scotland	3	3	-	-	-	-	15	-	-	-	1
Wales	5	-	-	3	-	-	12	-	-	-	-
GB (total)	20	37	-	14	-	-	209	4	2	-	2

Source: Cemex.

Note: For aggregates (sites include quarries and pits only, depots are excluded): CR = crushed rock; SG = sand and gravel (land-won); Spec = specialist aggregates; Marine = marine aggregates; Sec = secondary aggregates; Rec = recycled aggregates.

For RMX: Fixed = fixed plants; Site = site plants.

For cement: Works = cement works; Blend = blending station; Terminal = cement import terminal.

3.18 Cemex operates crushed rock quarries in the regions of the North-East, the North-West and the South-West of England, and in Scotland and Wales. It also operates sand and gravel pits across all the regions of England (with the exception of London and the South-West) and in Scotland. Cemex does not operate any sand and gravel pits in Wales.

3.19 Cemex operates fixed RMX plants across all the regions of England (with London being the only exception), and in Scotland and Wales. Around 90 per cent of its fixed RMX plants are based in England.

3.20 Cemex also operates two cement works in GB: at Rugby (the West Midlands) and South Ferriby (Yorkshire and the Humber), as well as a stand-alone clinker grinding and blending station at Tilbury (in the South-East).<sup>6</sup>

<sup>6</sup> Cemex response to the issues statement.

- 3.21 Cemex told us that its strategy for each of its relevant GB operations was primarily to ‘deliver growth organically’ and that innovation was at the ‘core’ of each relevant GB operation’s strategy, eg its RMX operations aimed to add four value-added products to its product portfolio each year. It added that each relevant GB operation was tasked with revenue growth and cost reduction to deliver a return on capital employed above its cost of capital and positive ‘economic value added’, both targets set by Cemex Group.
- 3.22 Cemex told us that in response to the market downturn, it had implemented a strategy of ‘rapid and substantial downsizing’.<sup>7</sup> Since 2007, under this strategy, Cemex had closed two cement works (Barrington and Rochester works) and mothballed one of its two kilns at its South Ferriby works; closed 30 quarries and 100 RMX sites; and reduced its UK workforce by 41 per cent.
- 3.23 Further details of Cemex’s relevant GB operations, including JVs and partnership arrangements, is set out in Appendix 3.1.

## *Hanson*

### *Company overview*

- 3.24 Headquartered in Maidenhead, Berkshire, Hanson’s core business lies in the production and sale of aggregates, cement and RMX. Its ultimate parent company is HeidelbergCement AG (Heidelberg), which is incorporated in Germany.
- 3.25 Table 3.5 shows the total gross revenues generated by each of Hanson’s operations, both within and outside the scope of the relevant GB operations. Other activities include the production of asphalt, building products and GGBS.

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<sup>7</sup> [Cemex response to issues statement](#), 24 April 2012, Section 2.

TABLE 3.5 Hanson: FY11 gross revenues by product division

	<i>FY11 gross revenues*</i> £m
Aggregates	[X]
Cement	[X]
RMX	[X]
Asphalt and Contracting†	[X]
Building Products‡	[X]
Other (part of Cement division)§	[X]

Source: Hanson.

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\*Total gross revenues include both external and internal sales.

†The Asphalt and Contracting division produces asphalt, including for road surfacing. It purchases aggregates from both internal and external sources.

‡Hanson's Building Products division produces bricks, concrete blocks, concrete paving, concrete floors and precast concrete. It purchases aggregates and cement from both internal and external sources.

§Hanson's Cement division supplies GGBS to Hanson's RMX operations and third-party RMX operations. It also supplies white cement to its own and third-party RMX producers. In addition, Hanson has a subsidiary called Calumite Ltd (in which it holds a 51 per cent stake), which produces material from GBS in bulk and bagged form for glass manufacturing plants in the UK.

3.26 Further details of Hanson's ownership, management and operational structure may be found at Appendix 3.1.

#### *Overview of relevant GB operations and strategy*

3.27 Table 3.6 provides an overview of the total number of active sites for Hanson's relevant GB operations as at 31 December 2011 and the distribution of sites across the regions of England, and in Scotland and Wales.

TABLE 3.6 Hanson's active production sites in England, Scotland and Wales

	Aggregates						RMX		Cement		
	CR	SG	Spec	Marine	Sec	Rec	Fixed	Site	Works	Blend	Terminal
North-East	1	-	-	-	-	-	3	1	-	-	-
North-West	2	2	1	-	-	1	25	2	1	-	-
Yorkshire & the Humber	4	5	1	-	-	1	16	-	-	-	1
East Midlands	1	5	-	-	-	-	10	-	1	-	-
West Midlands	1	6	-	-	-	-	13	-	-	-	-
East of England	-	2	-	-	-	2	6	-	-	-	-
London	-	-	-	1	-	1	12	1	-	-	-
South-East	-	6	-	1	-	2	41	2	-	-	-
South-West	6	4	3	-	-	-	26	-	-	-	1
England (total)	15	30	5	2	-	7	152	6	2	-	2
Scotland	-	-	-	-	-	-	9	1	-	-	-
Wales	14	-	3	2	-	-	19	-	1	-	-
GB (total)	29	30	8	4	-	7	180	7	3	-	2

Source: Hanson.

\*We requested that marine wharves should be treated as 'active production sites'. Hanson told us that it categorized a site as a wharf where it had 'in place substantial processing infrastructure'; and as a depot where material was landed but was then not subject to significant processing. Hanson told us that this categorization affected its sites at Appledore, Bridgwater and Garston.

Note: For aggregates (sites include quarries and pits, depots are excluded): CR = crushed rock; SG = sand and gravel (land-won); Spec = specialist aggregates; Marine = marine aggregates; Sec = secondary aggregates; Rec = recycled aggregates.

For RMX: Fixed = fixed plants; Site = site plants.

For cement: Works = cement works; Blend = blending station; Terminal = cement import terminal.

3.28 Hanson's primary aggregates business has quarrying operations across England and Wales, but does not have any quarrying operations in Scotland or in London.

3.29 Hanson's RMX operations have fixed plants in all the regions of England, and in Scotland and Wales. It told us that its RMX operations had a particularly strong presence in London, Manchester and Birmingham, but a very limited presence in Scotland, eg during FY11 it had active plants in Glasgow and Edinburgh but not in Aberdeen or Dundee (in relation to Dundee, its RMX site remained inactive throughout FY11).

3.30 Hanson also operates two cement works in England (Ketton and Ribblesdale works) and one in Wales (Padeswood works), in addition to two import terminals in England.

3.31 Hanson told us that Heidelberg's overall strategy for its UK business was to achieve profit growth through organic improvements by 'implementing cost efficiency meas-

ures, maintaining or improving margins through price negotiation with customers and maintaining/gaining market share at sustainable margins’.

3.32 Hanson told us that it continually reviewed the ‘profile of its network’, including focusing on both underperforming assets (for which performance should be improved), and those assets which should be closed, mothballed or sold. It added that it would also consider ‘potential asset acquisitions which might enhance its network (in particular, those which might allow for increased internal purchasing of cement and/or aggregates)’.

3.33 Further details of Hanson’s relevant GB operations, including JVs and partnership arrangements, is set out in Appendix 3.1.

## *Lafarge*

### *Company overview*

3.34 As explained in paragraph 3.1(a), the Anglo–Lafarge JV was conditionally cleared by the CC on 1 May 2012 subject to the satisfaction of a number of divestitures. The Anglo–Lafarge JV was allowed to proceed on 7 January 2013 creating Lafarge Tarmac (see paragraphs 3.54 to 3.57) following the implementation of the majority of these divestitures to MI, creating HCM (see paragraphs 3.58 to 3.63). In the following paragraphs, we describe Lafarge’s operations in the UK prior to that date.

3.35 Lafarge’s core activities were in the production and sale of cement, aggregates and RMX, as well as the production of asphalt, and the provision of asphalt surfacing and maintenance services and waste management services. Its ultimate parent company is Lafarge Group, which is incorporated in France.

3.36 Table 3.7 shows the total gross revenues generated by each of Lafarge's operations, both within and outside the scope of the relevant GB operations. Activities outside the scope of the relevant GB operations included the production of asphalt and gypsum (this business was sold in October 2011) and waste management services.

TABLE 3.7 Lafarge: FY11 gross revenues by product division

	<i>FY11 gross revenues £m</i>
Aggregates	[X]
Cement	[X]
RMX	[X]
Asphalt and contracting*	[X]
Plasterboard†	[X]
Waste management services‡	[X]
Other§	[X]

Source: Lafarge.

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\*Gross revenues exclude any share of JV's net sales after intercompany sales adjustments.

†In October 2011, Lafarge Group sold its European (including the UK) and South American gypsum business to Etex Group SA. Lafarge Group retained a [X] per cent stake in the combined entity. During FY11 (up to the end of December 2011), Lafarge's plasterboard operations purchased [X] kt of its own aggregates.

‡Lafarge offers waste management services for inert (eg soil and rubble), hazardous (eg contaminated soils and asbestos) and non-hazardous (eg municipal waste) waste materials. These services are provided on a very limited basis, and were primarily used for Lafarge's quarry restoration activities.

§Other activities include: (a) reselling concrete pump services to its RMX customers (Lafarge does not own any concrete pumps); and (b) generating rental income from Lafarge's non-operational real estate and property portfolio, as well as proceeds from the sale of any real estate.

3.37 Further details of Lafarge's ownership, management and operational structure may be found in Appendix 3.1.

#### *Overview of relevant GB operations and strategy*

3.38 Table 3.8 shows the total number of active sites for Lafarge's relevant GB operations as at 31 December 2011 and the distribution of sites across the regions of England, and in Scotland and Wales. See also Appendix 3.1 for further details.

TABLE 3.8 Lafarge's active production sites in England, Scotland and Wales

	Aggregates						RMX		Cement		
	CR	SG	Spec	Marine	Sec	Rec	Fixed	Site	Works	Blend	Terminal
North-East*	1	1	1	-	-	1	7	-	-	1	-
North-West	-	-	-	-	-	1	3	-	-	-	-
Yorkshire & the Humber	2	4	2	-	-	1	18	-	-	1	-
East Midlands	3	8	3	-	-	4	17	3	1	-	-
West Midlands	-	1	-	-	-	1	7	-	1	-	-
East of England	-	9	-	-	-	7	13	-	-	-	-
London	-	-	-	-	-	-	4	-	-	-	-
South-East	-	3	-	2	-	5	11	1	-	2	1
South-West	-	-	-	-	-	-	-	-	-	-	-
England (total)	6	26	6	2	-	20	80	4	2	4	1
Scotland	-	-	-	-	-	-	4	-	1	-	-
Wales	3	-	3	1	-	-	9	-	1	-	-
GB (total)	9	26	9	3	-	20	93	4	4	4	1

Source: Lafarge.

\*Lafarge's Thrislington site produces both crushed rock and sand and gravel, and therefore this site is double counted under 'CR' and 'SG' in this table. Whilst JVs are not shown in the table, Lafarge has one JV (Quarrington) in the North-East.

Note: For aggregates (sites include quarries and pits, depots are excluded): CR = crushed rock; SG = sand and gravel (land-won); Spec = specialist aggregates; Marine = marine aggregates; Sec = secondary aggregates; Rec = recycled aggregates. For RMX: Fixed = fixed plants; Site = site plants.

For cement: Works = cement works; Blend = blending station; Terminal = cement import terminal.

3.39 In terms of the number of active production sites, Lafarge's sand and gravel quarrying sites in England and Wales (when compared with its crushed rock sites) accounted for a substantial part of its primary aggregates operations. However, given the relatively smaller scale of its sand and gravel sites, Lafarge told us that it produced a greater volume of crushed rock than sand and gravel. Lafarge did not have any quarrying activities in London, the South-West and Scotland.

3.40 Lafarge's RMX operations were based in all the regions of England (with the exception of the South-West), and in Scotland and Wales.

3.41 Lafarge operated the only cement works in Scotland (Dunbar), and also operated three other cement works: one in each of the East Midlands (Hope, subsequently divested to MI (see paragraphs 3.58 to 3.63)), the West Midlands (Cauldon), and Wales (Aberthaw). It also operated one cement import terminal in the South-East.

- 3.42 Lafarge told us that in GB, its ‘main strategic priorities involve developing innovative building materials, systems and services that meet the expectations of Lafarge’s customers in terms of sustainable construction, aesthetics and cost and sustainability’. It added that product and innovation was a key feature of its strategy around the world, and that it dedicated more than €150 million a year to research, product development and industrial performance and process improvement.
- 3.43 Further details of Lafarge’s relevant GB operations, including JVs and partnership arrangements, are set out in Appendix 3.1.

## *Tarmac*

### *Company overview*

- 3.44 Prior to the formation of the Lafarge Tarmac JV, Tarmac’s ultimate parent company was Anglo American, which is incorporated in England and Wales. Tarmac was headquartered in Ettingshall, Wolverhampton. It was the holding company for Anglo American’s construction materials businesses in the UK and abroad.<sup>8</sup> Unless stated otherwise, references to Tarmac in this section mean Tarmac’s UK construction materials businesses only, of which its relevant GB operations are a part. In the following paragraphs, we describe Tarmac’s operations in the UK prior to 7 January 2013, when the Anglo–Lafarge JV was allowed to proceed, creating Lafarge Tarmac (see paragraphs 3.54 to 3.57).
- 3.45 In the UK, Tarmac comprised a group of companies engaged in the production of aggregates, RMX, cement, lime and asphalt, as well as in the provision of road surfacing and maintenance services, waste management services. Tarmac also had a building products business, Tarmac Building Products (TBP), which produces

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<sup>8</sup> Tarmac also has JV operations in the United Arab Emirates, Qatar and Oman, which are involved in the production of aggregates and asphalt, and also provide road surfacing services.

concrete blocks, bagged aggregates and foundry sands<sup>9</sup> and which was not contributed to the Anglo–Lafarge JV (see Section 1).

3.46 In FY11, Tarmac’s UK and international operations generated total consolidated revenues of £[x] and EBITDA of £[x], the vast majority [x] were generated in GB.

3.47 Table 3.9 shows the total gross revenues generated by each of Tarmac’s operations, both within and outside the scope of its relevant GB operations. Activities outside the scope of the relevant GB operations include the production of asphalt and building products, ie TBP.

TABLE 3.9 Tarmac: FY11 gross revenues by product division

	<i>FY11 gross revenues £m</i>
Aggregates	[x]
Cement	[x]
RMX	[x]
Asphalt*	[x]
National Contracting†	[x]
Granulate‡	[x]
Lime§	[x]
Building products ((ie TBP)¶)	[x]

Source: Tarmac.

\*In FY11, Tarmac’s [x] asphalt plants sourced [x] Mt of aggregates internally (ie from Tarmac) and [x] Mt externally.

†[x]

‡Tarmac has three operations which granulates slag to produce granulate or GBS which is then supplied to Hanson for grinding to produce GGBS. Tarmac purchases GGBS from Hanson and blends it with CEM I at its RMX plants.

§Tarmac operates two lime production sites at Tunstead and Hindlow (both in Derbyshire) and produces a range of lime products, eg quicklime, hydrated lime, milk of lime and natural hydraulic lime. The raw aggregates materials used in lime production are [x].

¶In FY11, TBP sourced [x] Mt of aggregates and [x] Mt of cement from Tarmac.

3.48 Further details of Tarmac’s ownership, management and operational structure may be found in Appendix 3.1.

<sup>9</sup> Tarmac told us that TBP separated from Tarmac Ltd in 2010 and had operated independently since that time. It added that trading between Tarmac Ltd and TBP, both pre- and post-separation, has consistently been classified as external within Tarmac’s submissions to the CC.

## Overview of relevant GB operations and strategy

3.49 Table 3.10 provides an overview of the total number of active sites for Tarmac's relevant GB operations as at 31 December 2011 and the distribution of sites across the regions of England, and in Scotland and Wales.

TABLE 3.10 Tarmac's active production sites in England, Scotland and Wales

	Aggregates						RMX		Cement		
	CR	SG	Spec	Marine	Sec	Rec	Fixed	Site	Works	Blend	Terminal
North-East	5	3	-	2	1	1	11	-	-	-	-
North-West	4	5	-	1	-	7	30	-	-	-	-
Yorkshire & the Humber	3	2	-	-	-	1	18	-	-	-	-
East Midlands	5	6	3	-	3	2	13	-	1	-	-
West Midlands	2	6	3	-	-	3	18	-	-	-	-
East of England	-	6	-	-	-	1	8	-	-	-	-
London	-	-	-	2	-	3	8	2	-	-	-
South-East	-	3	-	4	-	2	6	1	-	-	-
South-West	3	2	-	2	1	7	14	-	-	-	-
England (total)	22	33	6	11	5	27	126	3	1	-	-
Scotland	10	10	-	-	-	5	16	1	-	-	-
Wales	7	1	1	3	6	4	8	-	-	-	-
GB (total)	39	44	7	14	11	36	150	4	1	-	-

Source: Tarmac.

Note: For aggregates (sites include quarries, pits and depots): CR = crushed rock; SG = sand and gravel (land-won); Spec = specialist aggregates; Marine = marine aggregates; Sec = secondary aggregates; Rec = recycled aggregates. For RMX: Fixed = fixed plants; Site = site plants. For cement: Works = cement works; Blend = blending station; Terminal = cement import terminal.

3.50 In relation to aggregates, Tarmac's crushed rock operations included quarries across England, except in the regions of the East of England, London and the South-East, and in Scotland and Wales. In relation to sand and gravel pits, Tarmac operated sites across all the regions of England except London, in Scotland and in one site in Wales. Tarmac also had marine sand and gravel dredging sites and wharves in London, and across England and Wales. It told us that the location of its quarries was based on geology and the location of its minerals ownership. It said that its main strategic focus in aggregates had been to reduce its cost base and improve the operating cost efficiencies of production sites through the introduction of 'lean manufacturing principles; energy and logistics improvement programmes; mothballing units and taking out capacity in response in demand'.

- 3.51 Tarmac operated a single cement works (Tunstead) in the East Midlands, and did not operate any cement or clinker import terminals. It told us that its main strategy in relation to its cement operations had been to maximize the ‘capacity throughput’ at its Tunstead cement works, and that its business model was ‘focused on self-supply’ to its downstream RMX operations.
- 3.52 Tarmac’s RMX operations had national coverage and operated in all regions of England, as well as in Scotland and Wales. Tarmac operated site plants in London and the South-East. It told us that its site plants could be operated anywhere and were not limited to the South-East. It said that given the ‘local and highly competitive nature of the market’, its RMX strategy had been focused on ‘offering competitive prices’ and customer service. In response to the market downturn, Tarmac told us that it had mothballed a number of its RMX plants and introduced cost reduction and logistics improvement programmes.
- 3.53 Further details of Tarmac’s relevant GB operations, including JVs and partnership arrangements, are set out in Appendix 3.1.

### *Lafarge Tarmac*

#### *Company overview*

- 3.54 As set out in paragraphs 3.1(a) and 3.34 above, Anglo American and Lafarge concluded the Anglo–Lafarge JV on 7 January 2013, creating Lafarge Tarmac. The JV comprises the following business activities: cement, lime, aggregates, RMX, asphalt and asphalt surfacing, maintenance and waste services.

## Relevant GB operations and Strategy

3.55 Table 3.11 provides an overview of the total number of active sites for Lafarge Tarmac's relevant GB operations as at 7 January 2013 and the distribution of sites across the regions of England, and in Scotland and Wales.

TABLE 3.11 Lafarge Tarmac's active production sites in England, Scotland and Wales (as at 7 January 2013)

	Aggregates*						RMX†‡		Cement		
	CR	SG*	Spec	Marine	Sec	Rec	Fixed	Site	Works	Blend	Terminal
North-East	4	3	1	2	1	2	7	-	-	1	-
North-West	4	5	-	-	-	7	9	-	-	-	-
Yorkshire & the Humber	6	5	3	-	-	2	9	1	-	-	-
East Midlands	5	13	5	-	3	6	11	2	1	-	-
West Midlands	4	8	3	-	-	4	5	-	1	-	-
East of England	-	13	-	-	-	7	10	-	-	-	-
London	-	-	-	2	-	3	8	2	-	-	-
South-East	-	8	-	6	-	7	7	1	-	1	1
South-West	4	1	-	1	1	7	2	-	-	-	-
England (total)	27	56	12	11	5	45	68	6	2	2	1
Scotland	9	7	-	-	-	5	6	1	1	-	-
Wales	12	1	3	4	6	4	4	-	1	-	-
GB (total)	48	64	15	15	11	54	78	7	4	2	1

Source: Lafarge Tarmac.

\*SG sites include one JV site (Shepperton) in the South-East. Marine sites include two JV sites in South-East (Marchwood) and North-West (Mersey).

†Fixed sites include five plants which remain subject to the CC's divestiture undertakings: one each in Wales, East Midlands and Scotland, and two in Yorkshire and the Humber.

‡Five out of the ten RMX plants in the East of England are operated by a JV (C&H Quickmix)

Note: For aggregates (sites include quarries, pits and depots): CR = crushed rock; SG = sand and gravel (land-won); Spec = specialist aggregates; Marine = marine aggregates; Sec = secondary aggregates; Rec = recycled aggregates.

For RMX: Fixed = fixed plants; Site = site plants.

For cement: Works = cement works; Blend = blending station; Terminal = cement import terminal.

3.56 At its inception, Lafarge Tarmac owned:

- (a) *Cement*: four cement works, comprising the Dunbar, Aberthaw and Cauldon cement works previously owned by Lafarge (see paragraph 3.41) and the Tunstead cement works previously owned by Tarmac (see paragraph 3.51).
- (b) *Aggregates*: 127 primary aggregates quarries, 15 marine aggregates wharves and various other operations including 65 recycling and secondary aggregates sites.
- (c) *RMX*: 85 RMX plants.<sup>10</sup>

<sup>10</sup> As at the end of April 2013, a further four plants have not yet been divested by Lafarge Tarmac and will be divested separately during 2013.

3.57 According to internal documents prepared by a joint integration steering committee appointed by both Anglo American and Lafarge Group, the primary strategy for the Lafarge Tarmac JV is the [X].

### *Hope Construction Materials*

#### *Company overview*

3.58 As set out in paragraphs 3.1(a) and 3.34 above, on 7 January 2013 MI concluded its purchase of assets divested by Lafarge and Tarmac, creating HCM. HCM commenced operations with a cement works, a national network of RMX plants, aggregates quarries, rail depots and asphalt plants.

3.59 HCM is ultimately owned by MI, which is incorporated in Luxembourg. HCM was divested with a senior management team comprising former employees of Tarmac and Lafarge. On completion of the acquisition, Amit Bhatia (a member of the Mittal family) was appointed as Chairman.

3.60 Based on pro forma FY11 figures, HCM's total consolidated net revenues would be [X]. In FY13, HCM is forecast to generate total consolidated revenues of [X].

#### *Relevant GB operations and strategy*

3.61 Table 3.12 provides an overview of the total number of active sites for HCM's relevant GB operations as at 7 January 2013 and the distribution of sites across the regions of England, and in Scotland and Wales.

TABLE 3.12 HCM's active production sites in England, Scotland and Wales (as at 7 January 2013)

	Aggregates						RMX		Cement		
	CR	SG	Spec	Marine	Sec	Rec	Fixed	Site	Works	Blend	Terminal
North-East	1	-	-	-	-	-	14	-	-	-	-
North-West	-	-	-	-	-	-	16	-	-	-	-
Yorkshire & the Humber	1	-	-	-	-	-	26	-	-	-	-
East Midlands	-	-	-	-	-	-	19	-	1	-	-
West Midlands	1	-	1	-	-	-	19	-	-	-	-
East of England	-	-	-	-	-	-	8	-	-	-	-
London	-	-	-	-	-	-	-	-	-	-	-
South-East	-	2	-	-	-	-	21	-	-	-	-
South-West	-	-	-	-	-	-	9	-	-	-	-
England (total)	3	2	1	-	-	-	132	-	1	-	-
Scotland	-	-	-	-	-	-	12	-	-	-	-
Wales	-	-	-	1	-	-	14	-	-	-	-
GB (total)	3	2	1	1	-	-	158	-	1	-	-

Source: HCM.

Note: For aggregates (sites include quarries, pits and depots): CR = crushed rock; SG = sand and gravel (land-won); Spec = specialist aggregates; Marine = marine aggregates; Sec = secondary aggregates; Rec = recycled aggregates.

For RMX: Fixed = fixed plants; Site = site plants.

For cement: Works = cement works; Blend = blending station; Terminal = cement import terminal.

3.62 At its inception, HCM owned:

- (a) one cement works (the Hope cement works previously owned by Lafarge) with total annual clinker production capacity of [REDACTED] Mt;
- (b) 172 RMX plants (of which 158 are active) producing just over [REDACTED] million m<sup>3</sup> of RMX annually (based on 2010 figures); and
- (c) six primary aggregates sites and one aggregates depot, with production volumes of around [REDACTED] Mt annually.

3.63 HCM expects its revenues to grow steadily during the first five years following acquisition, driven by a recovery of demand for cement and increased utilization of its aggregates operations. At a high level, HCM's strategy in relation to its new cement, RMX and aggregates operations comprises the following:

- (a) *Cement*: [REDACTED].
- (b) *RMX*: [REDACTED].
- (c) *Aggregates*: [REDACTED].

### ***Medium-tier independents***

3.64 In the following paragraphs we set out profiles of ten medium-tier independents engaged in one, or a combination, of the following activities: the production of aggregates or RMX in GB, or the importation of cement into GB.<sup>11</sup> More detailed information about these companies may be found in Appendix 3.1. Table 3.13 provides an overview of these ten medium-tier independents.

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<sup>11</sup> The basis on which these firms have been selected for inclusion in this section is set out in the footnote to paragraph 3.1(b).

TABLE 3.13 Overview of the medium-tier independents included in this section

Operator and 2011 GB market shares*	Ultimate parent company, country of incorporation and market capitalization (December 2012)	Relevant GB operations	Relevant GB operations: FY11 gross revenues (unless stated otherwise)
Breedon Aggregates • Aggs: 3.0% • RMX: 2.0%	• Breedon Aggregates • UK • Market cap: £140m	• 26 aggregates quarries • 40 RMX plants	• Aggregates: £[redacted]m • RMX: £[redacted]m
Brett Group • Aggs: 1.0% • RMX: 2.0%	• Brett Group • UK • Not listed	• 32 aggregates quarries & wharves • 20 RMX plants • 1 cement import terminal (used for GGBS)	• Aggregates: £42m • RMX: £30m • Cement: N/A
CPV (Southern Cement† and Dragon Alfa) • Cement: N/A	• CPV • Spain • Market cap: €100m	• 2 cement import terminals	• Cement: £[redacted]m
Dudman Group‡ • Aggs: 0.5% • RMX: 0.5% • Cement: N/A	• Dudman Holdings Ltd • UK • Not listed	• 10 aggregates quarries • 6 RMX plants • [redacted] cement import terminals (4 active)	• Aggregates: £[redacted]m • RMX: £[redacted]m • Cement: £[redacted]m
Leiths • Aggs: 0.5% • RMX: 0.5%	• Leiths • UK • Not listed	• 15 aggregates quarries in Scotland • 6 RMX plants in Scotland	FY11 external net revenues only: • Aggregates: £[redacted]m • RMX: £[redacted]m
Marshalls • Aggs: 1.0% • RMX: N/A	• Marshalls • UK • Market cap: £200m	• 10 aggregates quarries • 1 RMX plant in Wales	• Aggregates: £[redacted]m • RMX: £[redacted]m
Sherburn • Aggs: 0.5% • RMX: 0.5% • Cement: N/A	• Sherburn • UK • Not listed	• 5 aggregates quarries • 5 RMX plants • 1 cement import terminal	• Aggregates: N/A • RMX: N/A • Cement: N/A
Thomas Armstrong • Aggs: 0.5% • Cement: N/A	• Thomas Armstrong • UK • Not listed	• 7 aggregates quarries • 1 cement import terminal	• Aggregates: £14m • Cement: £3m
Titan • Cement: N/A	• Titan Cement Group • Greece • Market cap: €1bn	• 1 cement import terminal	• Cement: £9m
Premier Cement‡ • Cement: N/A	• CRH Group • Ireland • Market cap: €10bn	• 1 cement import terminal	• Cement: £[redacted]m

Source: Various (see respective company profiles in the main body of this appendix).

\*Market shares equal to, or greater than, 0.3% have been rounded to the nearest 0.5%. Market shares equal to, or less than, 0.2% have been rounded up to 0.5%. Market shares are based on the following sources: (a) for aggregates: table titled 'Summary outputs and shares of aggregates companies – GB (Exc. Marine)' (p169) from BDS report *Estimated market shares of pits, quarries and marine wharves in Great Britain (2011)* (July 2012). Only land-won primary aggregates (ie excluding marine aggregates) are taken into account; and (b) for RMX: table of market shares of RMX companies in Great Britain (p54) of BDS report *Estimated market shares of ready mixed concrete companies in Great Britain (2011)* (July 2012). Market shares of the RMX market include onsite batching, eg volumetric trucks.

†On 15 January 2013, Dudman Group went into administration.

‡On 26 February 2013, CRH Group announced that it had reached agreement, effective immediately, on an asset swap with CPV, where, among the assets being transferred, CRH Group will acquire CPV's Southern Cement.

Notes:

1. N/A = not available.

2. Market capitalization figures are based on December 2012 figures.

## Breedon Aggregates

3.65 Breedon Aggregates Ltd (Breedon Aggregates) is listed on the Alternative Investment Market (AIM) on the London Stock Exchange with a current market

capitalization of around £140 million.<sup>12</sup> It is the largest independent heavy building materials producer in the UK behind the five Majors, employing over 800 people and operating 26 aggregates quarries, 40 RMX plants and 18 asphalt plants across central England, East Anglia and eastern England, and in the North and North-West of Scotland.<sup>13</sup> Breedon Aggregates also provides contracting services for civil works and road surfacing.

3.66 For FY11, Breedon Aggregates generated total consolidated revenues of £168.9 million and underlying earnings before interest, tax, depreciation and amortization (EBITDA) of £17.1 million,<sup>14</sup> with roughly equal revenue and EBITDA contributions from each of its English and Scottish operations.

#### *Brett Group*

3.67 Robert Brett & Sons Ltd (Brett Group) is the ultimate parent company for its two primary trading subsidiaries, Brett Aggregates Ltd (based in Faversham, Kent) and Brett Concrete Ltd (based in Aylesford, Kent). Brett Group is an independent producer of aggregates and RMX covering the South-East, including London, and hard landscaping products, eg concrete paving blocks. It also imports GGBS for use in its own downstream operations. For FY11, Brett Group generated total consolidated revenues of £157.8 million and an operating loss (before amortization and exceptional items) of £4.1 million.

#### *CPV (Southern Cement and Dragon Alfa)*

3.68 Cementos Portland Valderrivas SA (CPV) is headquartered in Madrid and is a listed Spanish multinational heavy building materials producer of cement, aggregates, RMX, concrete products and mortar, with a current market capitalization of around

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<sup>12</sup> [www.londonstockexchange.com](http://www.londonstockexchange.com) (4 December 2012).

<sup>13</sup> Site numbers are accurate as at 31 December 2011.

<sup>14</sup> Underlying EBITDA is stated before redundancy, reorganization and acquisition related costs, as well as before changes in the fair value of financial instruments and gains on bargain purchase. Source: Breedon Aggregates FY11 Annual Accounts.

€100 million.<sup>15</sup> In FY11, CPV generated total consolidated revenues of €686.5 million.<sup>16</sup>

3.69 CPV operates two cement import terminals in the UK, which imported around 380 kt of cement during FY11 through its two UK subsidiaries:<sup>17</sup> Southern Cement Ltd (Southern Cement) and Dragon Alfa Cement Ltd (Dragon Alfa). Southern Cement and Dragon Alfa import only CEM I bulk cement. Once imported, Dragon Alfa transports its cement within the UK via road using its own fleet of bulk tankers.<sup>18</sup> In FY11, Southern Cement and Dragon Alfa together generated total gross revenues of around £[ ] million.

3.70 On 26 February 2013, CRH plc (CRH Group) announced that it had reached agreement, effective immediately, on an asset swap with CPV, where among the assets being transferred, CRH Group will acquire CPV's Southern Cement.

#### *Dudman Group (in administration)*

3.71 Dudman Group Ltd (Dudman Group) is currently in administration. The description of its business that follows is based on its operations prior to its going into administration on 15 January 2013. Dudman Group is headquartered in West Sussex, and is an independent producer of aggregates and RMX, as well as an importer of cement and cementitious materials into GB. Dudman Group employs around [ ] staff, of which around [ ] are engaged in production activities and around [ ] in administrative roles.<sup>19</sup> Dudman Group's immediate and ultimate parent company is Dudman Holdings Ltd, a company incorporated in England and Wales.<sup>20</sup> Dudman Holdings

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<sup>15</sup> [www.bloomberg.com](http://www.bloomberg.com) (4 December 2012).

<sup>16</sup> [www.valderrivas.es](http://www.valderrivas.es).

<sup>17</sup> Whilst Southern Cement and Dragon Alfa are not 100 per cent owned by CPV, CPV through direct and indirect shareholdings owns the vast majority of their shares. Source: [www.valderrivas.es](http://www.valderrivas.es).

<sup>18</sup> Southern Cement does not own its fleet of vehicles.

<sup>19</sup> Dudman Group audited accounts for FY11.

<sup>20</sup> Dudman Group audited accounts for FY11.

Ltd is wholly owned by one private shareholder.<sup>21</sup> For its financial year ended 31 March 2011, Dudman Group generated total revenues of around £[~~8~~] million. On 15 January 2013, Dudman Group went into administration.

3.72 Dudman Group expanded its operations from recycling and earthworks to agricultural lime in 1993; sand and gravel in 1995 and 1996; cement importation in 2002; and shipping<sup>22</sup> in 2003. Between 2000 and 2006, Dudman Group opened six RMX plants. As at June 2012, within the markets subject to this investigation, Dudman Group operated one crushed rock quarry and nine sand and gravel quarries; six cement import terminals; and six RMX plants.

### *Leiths*

3.73 Leiths (Scotland) Ltd and its subsidiaries, Joss (Aberdeen) Ltd, Howie Minerals Ltd and Alexander Ross and Sons Ltd (together Leiths), produce aggregates and RMX, as well as concrete products and asphalt, in addition to providing a number of different services, including surfacing, specialist demolition and civil engineering.<sup>23</sup> For its financial year ended 31 December 2011, Leiths generated total consolidated revenues of £63.1 million from its continuing operations, and an operating profit of £3.8 million.<sup>24</sup> In total, across all of its subsidiaries, Leiths operates 15 aggregates quarries (13 crushed rock quarries and two sand and gravel pits). Leiths also has four specialist aggregates operations, five recycled aggregates operations and six fixed RMX plants, all of which are co-located at its primary aggregates sites which undertake multiple activities. All of Leiths' activities are carried out in Scotland.

3.74 In April 2008, Leiths acquired Howie Minerals Ltd, which was active in the production of crushed rock, limestone products and industrial fillers. In December 2010, Leiths

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<sup>21</sup> [www.dudmangroup.co.uk](http://www.dudmangroup.co.uk)

<sup>22</sup> [~~8~~]

<sup>23</sup> Leiths (Scotland) Ltd FY10 audited accounts.

<sup>24</sup> Leiths (Scotland) Ltd FY11 audited accounts.

acquired a 60 per cent shareholding in Alexander Ross and Sons Ltd, which operated a single quarry and sand and gravel operations in Inverness.

### *Marshalls*

3.75 Based in Huddersfield, Marshalls plc (Marshalls) is listed on the London Stock Exchange and has a current market capitalization of around £200 million.<sup>25</sup> Its primary activities are in the production, import and supply of high-quality natural stone and concrete hard landscaping, such as paving, walling and street furniture, for the construction, home improvement and landscape markets. It told us that its activities in aggregates and RMX accounted for a relatively small proportion of its total business: its total consolidated revenues for its financial year ended 31 December 2011 was around £334 million, of which around [X] per cent was accounted for by its aggregates and RMX activities.

### *Premier Cement*

3.76 Premier Cement Ltd (Premier Cement) is a UK cement importer in Northern Ireland and Wales. Premier Cement's ultimate parent company is CRH Group, a listed Irish multinational producer of heavy building materials, which operates in 36 countries. CRH Group is listed on the London, Dublin and New York stock exchanges, with a current market capitalization of around €10 billion.<sup>26</sup> For its financial year ended 31 December 2011, CRH Group generated total consolidated revenues of €18.1 billion and EBITDA of €1.7 billion.<sup>27</sup>

3.77 CRH Group operates in the UK through its UK holding company, CRH (UK) Ltd (CRH), which wholly owns Premier Cement. In addition to importing cement, CRH also produces and sells heavy building materials in GB, including concrete products

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<sup>25</sup> [www.londonstockexchange.com](http://www.londonstockexchange.com) (4 December 2012).

<sup>26</sup> [www.bloomberg.com](http://www.bloomberg.com) (4 December 2012).

<sup>27</sup> CRH Group FY11 Annual Report.

and bricks. CRH, however, does not produce any RMX in GB. In FY11, CRH generated total UK gross revenues of £[§] million. CRH told us that there were no 'commercial links' between Premier Cement and its other building materials operations in GB, and that all Premier Cement's cement sales were made to third-party customers.

- 3.78 Premier Cement's cement importation operations in GB commenced in July 2010 when it acquired Dan Morrissey Cement (UK) Ltd, a cement importer established in 1988, which at Swansea docks operated a cement import terminal with a depot for storage and a cement packaging facility. Premier Cement operates one cement import terminal in GB (ie the Swansea terminal), which has total capacity to import up to [§] kt of cement a year.
- 3.79 As mentioned for CPV above, on 26 February 2013, CRH Group will acquire CPV's Southern Cement as part of its asset swap agreement with CPV.

### *Sherburn*

- 3.80 Headquartered in County Durham,<sup>28</sup> Sherburn Minerals Ltd (Sherburn) is an independent producer of aggregates, RMX, concrete products and asphalt, as well as an importer of cement. It also provides road surfacing and waste disposal services.
- 3.81 As at May 2012, Sherburn operated five aggregates quarries, five RMX plants, one cement import terminal and one asphalt plant. Sherburn told us that it did not report the financial performance of each of its product divisions separately. Its total consolidated revenue for its financial year ended 31 March 2011 (which includes revenue from its contracting operations) was around £13.5 million.

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<sup>28</sup> [www.sherburngroup.co.uk](http://www.sherburngroup.co.uk).

### *Thomas Armstrong*

- 3.82 Thomas Armstrong (Holdings) Ltd (Thomas Armstrong) is a producer of aggregates, as well as a producer of aggregate and aerated blocks, precast concrete and timber products. It also provides a range of construction and related services.
- 3.83 Thomas Armstrong produces sand and gravel at two active sites and operates five other sites which purchase aggregates from quarry owners for packaging purposes, as well as a secondary aggregates site. It also operates one cement import terminal in Workington, in the North-West of England. In FY11, Thomas Armstrong generated total consolidated revenues of £116.2 million, of which its aggregates operations and cement import operations accounted for £13.7 million (12 per cent) and £2.6 million (2 per cent) respectively.

### *Titan*

- 3.84 Titan Cement Company SA (Titan Cement Group) is a listed Greek multinational producer of heavy building materials, including aggregates, cement, RMX, concrete products and fly ash, with a current market capitalization of around €1 billion.<sup>29</sup> Titan Cement Group has operations in Western Europe, south-eastern Europe, the eastern Mediterranean and North America.<sup>30</sup> For its financial year ended 31 December 2011, Titan Cement Group generated total consolidated revenues of €1.1 billion and EBITDA of €242.7 million, of which its operations in Greece and Western Europe (namely the UK, France and Italy) accounted for 25 per cent of revenues and 14 per cent of EBITDA. Titan Cement Group's cement operations in Greece and Western

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<sup>29</sup> Titan Cement Group has been listed on the Athens Stock Exchange since 1912. Source: [www.bloomberg.com](http://www.bloomberg.com) (4 December 2012).

<sup>30</sup> [www.titan.gr](http://www.titan.gr).

Europe comprise four cement plants, four cement import terminals and one fly ash processing plant.<sup>31</sup>

3.85 Titan Cement Group's UK operations are carried out by Titan Cement UK Ltd (Titan), which is based in Hull (East Yorkshire). Titan operates one cement import terminal in the commercial port of Hull. Titan told us that its UK cement import terminal acted as an 'additional outlet' for Titan Cement Group's cement production, supporting its ultimate parent company's supply of cement.

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<sup>31</sup> [www.titan.gr](http://www.titan.gr).

## 4. Framework for our competitive assessment

- 4.1 In this section, we explain the framework we used for our competitive assessment of the aggregates, cement and RMX markets.
- 4.2 The CC initially published guidelines for the conduct of market investigations in June 2003.<sup>1</sup> The CC decided in early 2010 that the guidelines should be updated to capture the lessons learnt from the market investigations the CC had conducted since the market investigation regime was introduced under the Act. In April 2011, the CC undertook a public consultation on a revised draft of its guidelines for market investigations. In April 2013, the CC published its revised guidelines for market investigations<sup>2</sup> (the Guidelines).
- 4.3 We begin this section by describing how we have had regard to the Guidelines in our investigation.<sup>3</sup> We then set out how we used ‘theories of harm’ (ie hypotheses as to how a possible market characteristic—or characteristics—could give rise to an AEC) in structuring our investigation. Finally, we set out how we have taken recent market developments into account.

### ***The Guidelines***

#### *Introduction*

- 4.4 In the following paragraphs, we describe how we have drawn on the Guidelines in deciding how to undertake our competitive assessment of the aggregates, cement and RMX markets. Extracts from the Guidelines are presented that are particularly

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<sup>1</sup> *Market Investigation References: Competition Commission Guidelines, CC3*, June 2003. An archive version is available at [http://webarchive.nationalarchives.gov.uk/20111108202701/http://www.competition-commission.org.uk/rep\\_pub/rules\\_and\\_guide/pdf/CC3.pdf](http://webarchive.nationalarchives.gov.uk/20111108202701/http://www.competition-commission.org.uk/rep_pub/rules_and_guide/pdf/CC3.pdf).

<sup>2</sup> *Guidelines for market investigations: Their role, procedures, assessment and remedies CC3 (revised)*, April 2013, available on the CC’s website at:

[www.competition-commission.org.uk/assets/competitioncommission/docs/2013/publications/cc3\\_revised\\_.pdf](http://www.competition-commission.org.uk/assets/competitioncommission/docs/2013/publications/cc3_revised_.pdf).

<sup>3</sup> We also refer in more detail to certain parts of the Guidelines in subsequent sections of this report as relevant.

relevant in the context of this market investigation.<sup>4</sup> We quote from the Guidelines at length on occasion, given their recent publication.

- 4.5 The Guidelines note in paragraph 36 that ‘The CC only carries out analysis that it considers necessary so as to reach a decision on the statutory questions. As the CC scrutinizes evidence, it will prioritize the uses of its resources to undertake as wide and as deep analyses as appropriate.’

### *The market investigation regime*

- 4.6 We noted the Guidelines’ explanation of the purpose of market investigations. Paragraph 18 of the Guidelines states that:

The CC’s market investigation regime sits within the broad spectrum of competition law, operating alongside other regulatory mechanisms, including prohibitions ..., by allowing the competition authorities the opportunity to assess whether competition in a market is working effectively, where it is desirable to focus on the functioning of the market as a whole rather than on a single aspect of it or the conduct of particular firms within it.

Paragraph 19 continues:

[The regime’s] overarching framework allows the investigation to tackle adverse effects on competition (AECs) from any source. As well as being able to look into the conduct of firms, the CC can probe for other causes of possible adverse effects on competition, such as structural aspects of the market (including barriers to entry and expansion) or the conduct of customers.

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<sup>4</sup> As explained in [paragraph 3](#) of the Guidelines: ‘While the CC will always have regard to these Guidelines in conducting market investigations, it will apply them flexibly and may sometimes depart from them, explaining its reasons for doing so, if it considers that the particular circumstances of the case (including the information available and the time constraints applicable) justify doing so.’

Paragraph 21 explains that ‘The identification of anticompetitive features in a market investigation or the imposition of remedies does not mean that market participants have infringed the law.’

4.7 In paragraph 30, the Guidelines note that:

The Act does not specify a theoretical benchmark against which to measure an AEC. In its market investigation reports the CC uses the term ‘a well-functioning market’ in the sense, generally, of a market without the features causing the AEC, rather than to denote an idealized, perfectly competitive market.

4.8 Given recent market developments affecting the reference products (see paragraphs 1.13 to 1.20), we also noted that the Guidelines state in paragraph 38 that:

Whatever forms competition takes, the CC considers its effects and expected development over time. Although there may be circumstances in which analysis can be conducted only on the basis of the current state of the market, the CC always considers how a market may evolve.

### *Features*

4.9 Section 131(2) of the Act:

states that the following may be taken to be a ‘feature’ of a market:

- (a) the structure of the market concerned or any aspect of that structure;
- (b) any conduct (whether or not in the market concerned) of one or more than one person who supplies or acquires goods or services in the market concerned; or

- (c) any conduct relating to the market concerned of customers of any person who supplies or acquires goods or services.<sup>5</sup>

However, the Guidelines also note in paragraph 155 that ‘The Act does not require the CC to state whether particular features of a market are to be considered structural features or an aspect of conduct’.

### *The AEC assessment*

4.10 The Guidelines explain the three key issues considered as part of the AEC assessment. Paragraph 94 states that the CC will look at:

- (a) the main characteristics of the market and the outcomes of the competitive process;
- (b) the composition of the relevant market within which competition may be harmed (market definition); and
- (c) the features, if any, which are harming competition in the relevant market (the competitive assessment—which the CC frames using ‘theories of harm’<sup>6</sup>), considering also possible countervailing factors, such as efficiencies, which may remove or mitigate the competitive harm of the features.

4.11 In the following paragraphs, we look at what the Guidelines say about market characteristics and outcomes, and about the competitive assessment. For ease of reference, we discuss what the Guidelines say about market definition in the market definition section (Section 5) of this report.<sup>7</sup>

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<sup>5</sup> The Guidelines, [paragraph 31](#).

<sup>6</sup> See [paragraph 4.18](#).

<sup>7</sup> In the context of market definition, we note at this point that the Guidelines state in [paragraph 153](#) that ‘The CC may also consider effects in neighbouring markets, including those which are upstream or downstream of the relevant market’.

### *Market characteristics*

- 4.12 According to the Guidelines (paragraphs 97 to 102), pertinent market characteristics may include market shares, the nature and characteristics of the products or services, the nature of the customer base, the legal and regulatory framework that applies to the reference market, industry practices, and the history of the market, including recent competitive developments and any significant changes that are anticipated in the market in the foreseeable future.

### *Market outcomes*

- 4.13 As set out in paragraph 103 of the Guidelines, outcomes of the competitive process that the CC may take into account include prices, profitability, innovation, product range and quality. In relation to price and profitability, the Guidelines describe four possible types of analysis that the CC may undertake: pricing patterns; price cost margins; price comparisons; and profitability.
- 4.14 We set out our framework for assessing profitability, which is common across the three reference products, in Appendix 4.1. Our assessment of the cost of capital,<sup>8</sup> the benchmark against which we assess profitability relating to each of reference products, is set out in Appendix 4.2. Any elements of the profitability assessment framework which are specific to an individual reference product are handled in the relevant product-specific appendix.<sup>9</sup> As we assess the state of competition on an individual market-by-market basis, rather on a global pan-market basis, we also assess the profitability of the Majors' cement, aggregates and RMX operations

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<sup>8</sup> The cost of capital is the minimum return that investors in a project expect to receive over the period of that investment. It is an opportunity cost and can be seen as the yield on capital employed in the next best alternative use.

<sup>9</sup> All the Majors prepare financial information under the historical cost accounting (HCA) rules in accordance with UK or international accounting standards. Some Majors have revalued some of their fixed assets, in which case the basis of preparation is described as modified HCA. We, however, are more interested in economic profitability where profits are determined based on the continuing costs of supply. In such an analysis, the value of resources consumed and assets utilized should reflect their current value to the business, not their historical cost. This latter accounting basis of preparation is described as current cost accounting (CCA). We seek to present our assessment of the levels of profitability both on an HCA and a CCA basis. In determining the level of profitability, we recognize impairment losses as well as the more typical asset depreciation charges. These impairment losses relate to the unexpected diminution in the current value of assets used in the supply of the reference products due to the emergence of excess capacity following the unexpected slump in demand in 2007. These impairment losses do not represent any cash flows incurred in the period, rather recognition during the period that assets are now not worth as much to the business as previously thought.

separately, ie on a stand-alone basis for each product. It is therefore important that any sales or purchases between the activities of vertically-integrated companies reflect market prices so that profitability of each individual market is correctly identified.<sup>10</sup>

### *The competitive assessment*

4.15 According to paragraph 157 of the Guidelines, ‘Structural features may include high levels of market concentration, high entry barriers, ... and buyer power’. Paragraph 158 of the Guidelines notes that government policy and regulation can also be structural features.

4.16 According to paragraph 160 of the Guidelines:

The conduct of firms which supply the market when acting in other markets can be a feature of the market. For example, if the market investigation concerned competition to supply a particular manufactured good, the conduct of vertically integrated suppliers in the market for the input might be a conduct feature.

4.17 Paragraph 162 of the Guidelines notes that ‘In some circumstances, several features may in combination harm competition’.

### **Theories of harm**

4.18 Paragraph 163 of the Guidelines explains that ‘To provide focus and structure to its assessment of the way competition is working in a market the CC sets out one or more “theories of harm”. A theory of harm is a hypothesis of how harmful competitive effects might arise in a market and adversely affect customers.’ Paragraph 165 of the

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<sup>10</sup> So long as internal transfer prices between a vertically integrated firm’s upstream and downstream operations are consistent with market (external) prices, a persistently loss-making situation would suggest that it would be rational for the firm to exit that market. This is even the case when some of the firms’ costs vary only in the very long run as it is necessary to recover all costs in order to operate on a sustainable basis.

Guidelines continues by stating that ‘The starting point for formulating theories of harm in market investigations is the work already done by the referring body, particularly the terms of reference ... and decision documents.’

4.19 Paragraph 170 of the Guidelines says that:

competitive harm can flow from five main sources:<sup>11</sup>

- (a) unilateral market power;
- (b) barriers to entry and expansion;
- (c) coordinated conduct;
- (d) vertical relationships; and
- (e) weak customer response.

4.20 Building on the observations about the supply of aggregates, cement and RMX made by the OFT in its reference decision (see paragraphs 1.9 and 1.10), we identified four theories of harm in our issues statement (see paragraph 1.22) in relation to each of the reference markets:

- (a) Theory of harm 1: high levels of concentration and barriers to entry mean that the suppliers can exercise unilateral market power.
- (b) Theory of harm 2: coordination between producers prevents, restricts or distorts competition.
- (c) Theory of harm 3: vertical integration and exclusionary behaviour.<sup>12</sup>
- (d) Theory of harm 4: aspects of policy and regulation have the effect of preventing, restricting or distorting competition.

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<sup>11</sup> Paragraph 172 of the Guidelines notes that these sources are not mutually exclusive.

<sup>12</sup> Aggregates and cement are key inputs into the supply of RMX. Some of the companies involved in these sectors are vertically integrated. Notably the four cement producers present in GB also have significant RMX operations and (with one exception) significant aggregates operations. Other companies also have both aggregates and RMX operations, and may be involved in the importation of cement. These aggregates producers may also be integrated into the production of other downstream products such as asphalt.

- 4.21 We used these theories of harm to structure our investigation, and we reported on the progress of our investigation under each of these headings when we published our updated issues statement (see paragraph 1.24). We note that much of the same evidence is relevant to consideration of the possible existence of both unilateral market power and coordination and that, taken in isolation, some evidence may be consistent with both coordinated and non-coordinated behaviour (see paragraph 4.28). In this report we therefore present our assessment of the scope for unilateral market power and coordination together for each reference product. Our assessment of vertical effects and the competitive impact of policy and regulation are presented in further separate sections.
- 4.22 In the following paragraphs, we develop our theories and set out certain relevant extracts from the Guidelines that relate to how the CC will undertake its assessments of unilateral market power, coordination and vertical relationships.

### *Unilateral market power*

- 4.23 In more detail, our theory is that individual suppliers have market power within relevant markets as a result of market concentration and barriers to entry. Such suppliers would have the ability to set higher prices than would otherwise be the case, or reduce the quality of other aspects of their offer, as a result of limited competition from other suppliers, and limited threat of entry or expansion into the market by other suppliers.
- 4.24 We examine these issues in Sections 6, 7, 8 and 9.
- 4.25 The following parts of the Guidelines are pertinent (among others) to this theory of harm, in the context of our investigation:

- (a) Paragraph 178 of the Guidelines explains that ‘... competition within a market may be weak when one or more market participants enjoys significant market power, and is therefore able to influence market outcomes and other important aspects of competition’.
- (b) Paragraph 180 of the Guidelines lists direct indicators of market power, including high profits ... , high price-cost margins .... , low single firm demand elasticities ... or other evidence of adverse effects in the form of high prices, low quality and limited choice ... . Paragraph 181 of the Guidelines also notes that the way a firm behaves may give an indication of the market power that it may enjoy.
- (c) Paragraph 185 of the Guidelines lists the most common reasons for one or more firms to possess unilateral market power: high concentration, capacity constraints; lack of substitutability; and the absence of supply-side constraints.<sup>13</sup>
- (d) Paragraph 189 of the Guidelines explains that:

... market concentration and the exercise of unilateral market power are not necessarily linked to the position of a single firm. A market with a small number of suppliers which are protected by barriers to entry (an oligopoly), for example, may be characterized by significant market power. One mechanism by which this market power can manifest itself is through coordinated conduct ....

However, unilateral market power can be enjoyed by a number of firms even where they act independently, albeit aware of each other’s presence—so-called ‘non-coordinated oligopolies’.

### *Coordination*

4.26 In more detail, our theory is that there is coordination between suppliers that distorts or restricts competition, either in any of the individual product markets, or spanning

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<sup>13</sup> In relation to the absence of supply-side constraints, [paragraphs 200 to 204](#) of the Guidelines explain that this means there is no prospect of expansion into the market by firms already possessing the assets necessary to produce the goods or services concerned.

more than one product market. This arises because suppliers are aware and take into account that competition with rivals (for example, to undercut their prices in order to win more business) will lead to competitive responses by rivals, with the result that their profits will ultimately be lower than if they avoided or limited competition. The result of coordinated behaviour (which can take different forms for different firms in the market) is that prices are higher (or the quality aspects of firms' offers are lower) than would otherwise be the case.

4.27 We examine these issues in Sections 6, 7, 8 and 9.

4.28 The following parts of the Guidelines are pertinent (among others) to this theory of harm, in the context of our investigation:

(a) Paragraph 238 of the Guidelines notes that 'Coordination typically involves repeated interaction, aimed at increasing or protecting profits, between firms in the market. But coordination can take different forms across a wide spectrum of behaviour'. Paragraph 239 continues:

At one end of the spectrum, direct and unambiguous communication among competitors can lead to explicit agreements to fix prices, share markets or allocate customers. At the other end of the spectrum, when a market is sufficiently stable and rival firms interact repeatedly they may be able to anticipate each other's future actions, enabling them tacitly to establish a coordinated course of action without communicating directly or sharing information. Coordination does not have to be 'perfect' at all times to affect a market. For example, it may be intermittent; ie periods of coordination may be interspersed with periods of greater competition when not all competitors see it in their interest to cooperate.

Paragraph 240 concludes that ‘Any form of coordination has the potential to reduce strategic uncertainty among competitors to the detriment of their customers and, depending on the degree, may thereby result in an AEC’.<sup>14</sup>

(b) In relation to how the CC will assess whether coordination is giving rise to an AEC, paragraph 244 of the Guidelines states that:

the CC will examine the evidence of the behaviour of firms in the market, structural characteristics of the market and market outcomes. In doing so, the CC considers whether market conditions are conducive to coordination, seeks to understand the way in which the firms in the market operate and comes to a view on whether the observed outcomes are best explained by coordinated or non-coordinated behaviour.

Paragraph 249 notes that ‘The CC will generally look at a range of market outcomes in combination. A single outcome looked at in isolation may often be consistent with both coordinated and non-coordinated behaviour.’

4.29 Further details of what the Guidelines say about how the CC will assess whether coordination is giving rise to an AEC are set out in Sections 7 and 8 of this report.

### *Vertical integration and exclusionary behaviour*

4.30 There are several different ways in which vertical integration could affect competition in these markets. One hypothesis is that vertical integration itself affects suppliers’ costs so that non-integrated suppliers are unlikely to be able to compete effectively with integrated suppliers. Another hypothesis is that one integrated supplier (acting unilaterally) is raising the price of cement (and/or aggregates) relative to the prices of RMX, with the effect of squeezing the margins of non-integrated RMX suppliers, such

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<sup>14</sup> Paragraph 240 also notes that ‘The sole focus of any market investigation is upon the effects on competition of possible features of the market (whether through coordinated conduct or otherwise) and it is not the CC’s role to ascertain whether one or more parties have been acting unlawfully. While enforcement action on some cases of coordinated behaviour may fall within Article 101 of the TFEU or Chapter 1 of CA98, the CC may investigate all forms of coordination.’

that non-integrated suppliers are weakened or excluded from the market. A variant on this hypothesis is that several integrated suppliers (acting collectively) are squeezing the margins of non-integrated RMX suppliers.

4.31 We examine these issues in Section 10.

4.32 The following parts of the Guidelines are pertinent (among others) to this theory of harm, in the context of our investigation:

(a) Paragraph 267 of the Guidelines notes that:

... despite their potential to enhance efficiency and consumer welfare, vertical relationships can also sometimes lead to an AEC in a market, particularly by allowing the firms to:

- (a) foreclose<sup>15</sup> rivals' access to inputs and customers; and/or
- (b) otherwise have a dampening effect on competition.

(b) In relation to foreclosure, paragraph 274 of the Guidelines states that:

For vertical relationships to result in foreclosure of rivals, the firms involved must have significant market power in one or more markets along the supply chain. They will also need to have both the ability and an incentive to seek to foreclose rivals (this will not necessarily be the case, even if the firms enjoy significant market power).

(c) In relation to the potential for vertical relationships to otherwise dampen competition, the Guidelines state in paragraph 271 that:

Since the rationale for vertical relationships is often unconnected to competition issues ..., a widespread network of overlapping vertical relationships may develop within an industry. While such arrangements may address market failures, they can have far-reaching

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<sup>15</sup> According to [paragraph 269](#) of the Guidelines 'Foreclosure can be total (where rivals are forced to exit from the market or are prevented from entering) or partial (where rivals or potential entrants—are materially disadvantaged and consequently compete less effectively).'

effects on the operational structure of the upstream and downstream markets, reducing the incentives on firms to compete vigorously against each other and possibly leading to an increased likelihood of coordinated conduct by firms at the same level of the supply chain and to a greater incidence of entry barriers.’

Paragraph 294 notes that:

These potential effects, for example the possibilities of coordination or entry barriers arising from competition-dampening relationships are assessed in the ways described in the relevant sections [of the Guidelines] on coordinated conduct and entry barriers.

*Aspects of policy and regulation have the effect of preventing, restricting or distorting competition*

4.33 Under this theory, we assess whether any aspect of regulation of these industries, or the implementation of policies relevant to these industries, has the effect of preventing, restricting or distorting competition. While we recognize the possible benefits of such measures, we also consider whether they might have any adverse effects on competition that should be acknowledged, such as distorting behaviours or creating a barrier to entry.

4.34 We assess this in Section 11.

***Effect of recent developments***

4.35 We note finally that the analysis conducted in this investigation that uses information and data from before January 2013 relates to the operation of markets for aggregates, cement and RMX prior to the formation of Lafarge Tarmac and HCM. Due to the timing of this investigation and of the statutory deadlines under which the CC operates, in reaching our decisions, much of the evidence on which these provisional findings are based relates to 2012 and earlier years.

- 4.36 The extent to which these recent developments affect our analysis and findings depends on the degree to which they might be expected to have a material effect on the particular issue under investigation. Some aspects of our analysis and findings are unlikely to be affected by these events.<sup>16</sup>
- 4.37 In relation to other aspects of our investigation, the formation of Lafarge Tarmac and HCM might be expected to change the structure of the relevant markets, with potential implications for suppliers' competitive strategies and future market outcomes. In relation to these aspects of our investigation, we formed a view of the weight to be attached to the most recent evidence about the current operation of the market as well to evidence about how markets operated in the past.

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<sup>16</sup> For example, we would not expect these events to have any material effect on the regulatory framework or the extent of barriers to entry and/or expansion.

## **5. Market definition**

### ***Introduction***

5.1 In this section, we set out the approach we have taken in this investigation to market definition in relation to the supply of aggregates, cement and RMX. The focus of our analysis of market definition has been to examine the extent of substitution between different products and how this may vary by customer, location or application. This assessment of substitution, and the relevant markets defined as a result, provides a framework for our competitive assessment. We have had regard to the Guidelines in defining the relevant markets for our investigation:

(a) Paragraph 132 of the Guidelines explains how the CC conducts market definition in its market investigations, namely that:

... the CC identifies the participating firms and customers and the traded products in the market(s) that are the subject of the reference. This enables the CC to focus on the sources of any market power and provides a framework for its assessment of the effects on competition of features of a market.

(b) Paragraph 133 of the Guidelines states in addition that:

Market definition is thus a useful tool, but not an end in itself, and identifying the relevant market involves an element of judgement. The boundaries of the market do not determine the outcome of the CC's competitive assessment of a market in any mechanistic way. The competitive assessment will take into account any relevant constraints from outside the market, segmentation within it, or other ways in which some constraints are more important than others.

(c) Paragraph 130 of the Guidelines explains the role of demand-side and supply-side constraints in market definition: 'The willingness of customers to switch to other products is a driving force of competition. In forming its views on market

definition, the CC will therefore consider the degree of demand substitutability. In some markets, supply-side constraints will also be important.’

(d) In paragraph 142, the Guidelines note that there are both product and geographic dimensions to market definition, and that markets can also be defined with reference to customer group or temporal factors.

5.2 We note that, in the Anglo–Lafarge JV inquiry (see paragraph 1.16), the CC also considered the appropriate scope of markets for aggregates, cement and RMX. We have drawn on the CC’s assessment of market definition in that case, and on the evidence that it took into account in reaching its conclusions. However, we have conducted our own assessment of this issue and have collected additional evidence to inform our view of the appropriate market definition for the particular purposes of our investigation. This has led us to take a different approach from the Anglo–Lafarge merger inquiry on some aspects of market definition and we set out, with our reasons, where this is the case.

5.3 In the remainder of this section we consider the product and geographic scope of relevant markets for aggregates, cement and RMX, and set out our conclusions on market definition.

### ***Aggregates***

5.4 We set out below our consideration of market definition in relation to aggregates, first in relation to product market definition and then in relation to the geographic scope of aggregates markets.

#### ***Product market definition***

5.5 During our investigation, we invited views from interested parties on the substitutability of different types of aggregates and the approach that we should take to product

market definition for aggregates. Most of the submissions we received on this topic came from the Majors—and views expressed by other parties were embraced by the comments made by the Majors. Further details of the Majors' submissions on this issue are in Appendix 5.1. In summary:

- (a) Most of the Majors (Lafarge, Aggregate Industries, Cemex and Tarmac) told us that the relevant market for construction aggregates should include all aggregates (whether crushed rock or sand and gravel, and whether primary or recycled and secondary). Hanson did not submit a view on the precise product market definition for aggregates, but commented that primary aggregate suppliers were subject to significant constraints from recycled and secondary aggregates suppliers. The rationale for the view that we should not look at sand and gravel and crushed rock separately was essentially that different rates of usage in local areas could be explained by geological constraints (eg lack of local availability in certain local areas) and were not evidence of limited substitutability. Proponents of this view argued that both sand and gravel and crushed rock could be, and were, used interchangeably, eg for RMX and concrete products.
- (b) Two Majors (Tarmac and Cemex) commented specifically on specialist aggregates for non-construction uses (for example, rail ballast, high PSV and high purity limestone (HPL) for flue gas desulphurization). They said that there were separate product markets for each of these specialist aggregates, because customers for these products could not substitute between them (this is known as lack of demand-side substitutability).

5.6 A number of the arguments put forward by the Majors were uncontroversial and we have incorporated these into our approach to product market definition. In particular:

- (a) We agreed with Lafarge, Aggregate Industries, Cemex and Tarmac that different grades (ie particle sizes) of aggregates are effective substitutes because of the ease with which suppliers could switch between production of different grades,

including between fine and coarse aggregates, or at any rate invariably produce a range of grades alongside one another from a given quarry or aggregates reserve.<sup>1</sup> We found that different grades of primary aggregates can be produced from both crushed rock and sand and gravel and each quarry tends to produce multiple grades. The different grades are produced by screening and, if necessary, crushing and washing the aggregates that have been quarried. Given the high degree of supply-side substitutability, we therefore concluded that different grades of aggregates should be included within the same product market.

(b) We also agreed with Tarmac and Cemex that specialist aggregates (eg rail ballast, HPL) are in different product markets from each other and from construction aggregates, as these are used for different applications, there is no demand-side substitution and there is no supply-side substitution.

5.7 We consider in more detail below two aspects of product market definition which raised more complex issues:

(a) the extent to which crushed rock and sand and gravel aggregates are demand-side substitutes (paragraphs 5.8 to 5.11); and

(b) the extent to which recycled and secondary aggregates are demand-side substitutes for primary aggregates (paragraphs 5.12 to 5.22).

*Substitution between crushed rock and sand and gravel*

5.8 As explained in Section 2, there is a 'rock line' in Great Britain, to the north and west of which most aggregates produced are crushed rock aggregates, and to the south and east of which most aggregates produced are sand and gravel. Given this geographic distribution of different types of rock with Great Britain, the availability of

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<sup>1</sup> In other words, there is a high degree of supply-side substitutability between different grades of aggregates.

product locally is an important determinant of whether to use crushed rock or sand and gravel, where both can be used for a particular application.

5.9 All the Majors submitted evidence and arguments to indicate that both crushed rock and sand and gravel can be used for a wide range of applications and that their substitutability for each other is illustrated by the levels of regional variation in the use of aggregates in downstream applications.<sup>2</sup> In particular, all the Majors provided data showing, for their internal businesses (RMX, concrete product production<sup>3</sup> and asphalt), the proportion of aggregates used by type and by region.<sup>4</sup>

5.10 The evidence suggests some variation in substitutability between crushed rock and sand and gravel depending on the application:

(a) For RMX and concrete products, there is a large variation in the use of sand and gravel and crushed rock depending on the region: for instance, in Wales and the North-West, RMX is produced predominantly using crushed rock as the coarse element of the mix, whereas in the South-East, East Anglia and the East Midlands, it is produced almost solely with sand and gravel.<sup>5</sup>

(b) For asphalt production, there is relatively little use of sand and gravel (although this tends to vary somewhat by region<sup>6</sup>), whereas crushed rock (including high PSV) appears to be the main aggregate used. The British Aggregates Association (BAA) told us that gravel was not appropriate for the production of asphalt, because the aggregates used for asphalt needed to be angular.

However, several other parties told us that producers were able to make gravel

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<sup>2</sup> For example, Lafarge told us that the extent of regional variation in the use of aggregates in downstream applications indicated the extent of substitutability between different types of construction aggregates in the same product market.

<sup>3</sup> Lafarge does not operate a concrete product production business.

<sup>4</sup> We reproduce the data provided by Aggregate Industries and Lafarge in Appendix 5.1. The data from all Majors shows very similar patterns.

<sup>5</sup> Aggregate Industries explained that RMX could be made out of sand and gravel, or sand and crushed rock. The sand could either occur naturally, or it could be manufactured by washing crushed rock fines. Aggregate Industries told us that, in areas where sand and gravel was prevalent, sand and gravel would be the exclusive or almost exclusive aggregate used in RMX production, whereas in areas where sand and gravel was scarce or inaccessible, RMX was produced using crushed rock products.

<sup>6</sup> For example, Tarmac noted that in certain regions of GB (eg the South-West and East Anglia), BDS data showed that a non-trivial proportion of aggregates used in asphalt production was sourced from sand and gravel.

angular by crushing it so that it was suitable for use in asphalt. The MPA also provided data on the use of aggregates in GB asphalt manufacture. According to the data from the MPA, sand and gravel accounted for about 11 to 12 per cent of primary aggregates used in asphalt production in 2009 and 2010.<sup>7</sup>

(c) The Majors do not use aggregates directly themselves for general construction purposes. However, [redacted] and Tarmac both provided estimates of the types of aggregates used in general construction (see Appendix 5.1), and this data suggests that there is relatively little use of sand and gravel for general construction (5 to 10 per cent of aggregates used<sup>8</sup>); the main aggregates used being crushed rock and recycled/secondary aggregates mostly as sub-base and structural fill. [redacted] also provided estimates of the use of aggregates for general construction by region, which suggested that even in regions where sand and gravel was prevalent, crushed rock and recycled aggregates were the main aggregates used. Cemex told us that there was considerable substitution between crushed rock and sand and gravel for use in general construction, and that the decision of which type of aggregate to use in a particular area would be driven by cost and availability.

5.11 Overall, we concluded that the choice between crushed rock or sand and gravel is largely influenced by geology and availability for RMX and concrete production. For asphalt production, it appears that sand and gravel aggregates are generally less suitable than crushed rock.<sup>9</sup> For general construction uses, the evidence suggests that sand and gravel aggregates are used in relatively small proportions overall, but that they are potentially interchangeable in such applications.

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<sup>7</sup> Source; data from ONS, Business Monitor PA 1007 Mineral extraction in Great Britain.

<sup>8</sup> Aggregate Industries told us that, while the use of sand and gravel for general construction was difficult to estimate accurately, it did not believe that a 5–10 per cent estimate could be accurate.

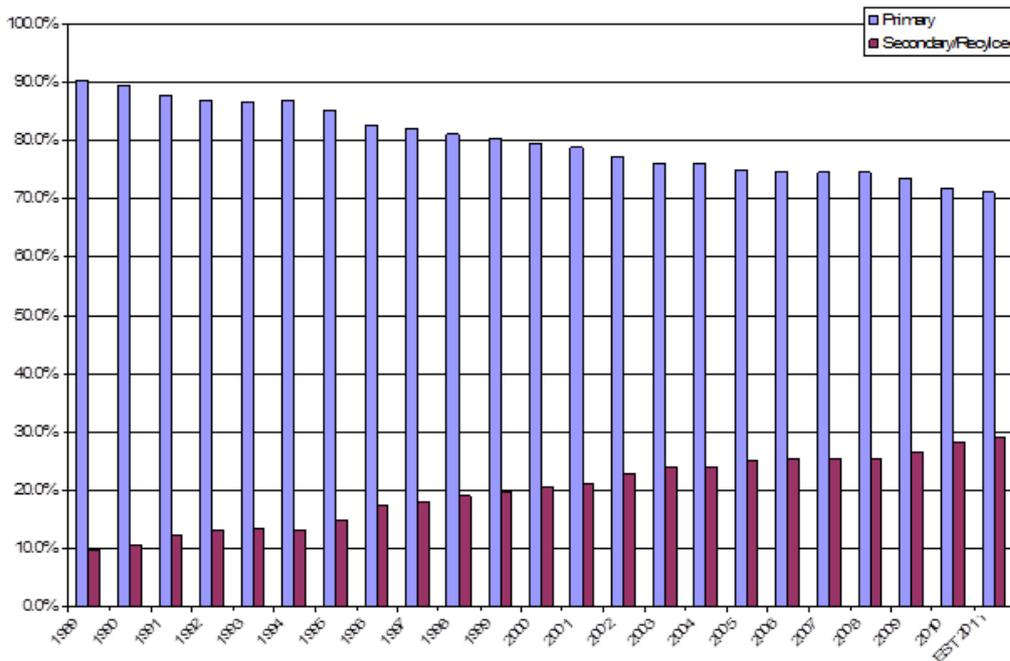
<sup>9</sup> Aggregate Industries told us that it was not accurate to suggest that sand and gravel were not good substitutes for crushed rock in asphalt applications, and that sand and gravel made up more than 7 per cent of the aggregates used by Aggregate Industries' own asphalt businesses. This is similar to the estimates provided by Tarmac in Appendix 5.1. We consider that these low proportions of use of sand and gravel in asphalt (compared with crushed rock which accounts for over 70 per cent of the aggregates used in asphalt) suggest that sand and gravel aggregates are not generally as suitable for asphalt production as crushed rock aggregates.

*Substitution between primary and recycled/secondary aggregates*

5.12 Figure 5.1 shows the trend in the overall share of aggregates sales accounted for by recycled and secondary aggregates. This shows a steady increase from around 10 per cent of total sales in 1989 to just below 30 per cent in 2011.

FIGURE 5.1

**Share of primary and recycled/secondary aggregates, 1989 to 2011**



Source: MPA statistics.

5.13 The extent of substitution between primary and recycled/secondary aggregates varies significantly depending on the application. The scope for substitution will also vary according to the availability of recycled aggregates, given that the main source of recycled aggregates is demolition activity.<sup>10</sup>

<sup>10</sup> In this context, Hanson told us that where construction took place on a brownfield site (ie a site where there had previously been building development), there was a readily available source of recycled material for the project, whereas when construction was at a greenfield site (where there had been no previous development), recycled aggregates would not be available directly at the site.

- 5.14 We reviewed several sources of evidence on the substitutability between primary and secondary aggregates for different applications, including evidence gathered by the CC during the Anglo–Lafarge JV inquiry.
- 5.15 First, we reviewed estimates provided by [X] and Tarmac (based on BDS data) on the extent to which different aggregates are currently used for different applications in GB. These estimates, which are presented in Appendix 5.1, indicate that:
- (a) For the manufacture of RMX (which accounts for about 20 per cent of aggregates used in GB), the main aggregates used are sand and gravel (60 to 65 per cent) and crushed rock (25 to 30 per cent). Use of recycled and secondary aggregates is low (5 to 15 per cent).
  - (b) For the manufacture of concrete products (which accounts for about 10 per cent of aggregates used in GB), the main aggregates used are sand and gravel (50 to 55 per cent) and crushed rock (30 to 40 per cent). Usage of recycled and secondary aggregates is low (5 to 15 per cent).
  - (c) For the manufacture of asphalt (which accounts for about 12 per cent of aggregates used in GB), the main aggregates used are crushed rock (70 to 75 per cent). Sand and gravel accounts for 5 to 15 per cent of use, and secondary and recycled aggregates account together for 10 to 20 per cent of use.
  - (d) For general construction (which accounts for about 50 per cent of aggregates used in GB), the main aggregates used are crushed rock (45 to 50 per cent) and recycled and secondary aggregates (40 to 50 per cent).
- 5.16 The estimates provided by Tarmac also show that, between 2008 and 2010, the proportions of recycled and secondary aggregates used in each application have remained relatively constant (a small reduction in use for concrete, and a small increase for asphalt and general construction).

5.17 Commenting on these figures, Hanson told us that one factor that governed the ability to use secondary and recycled aggregates in RMX was limited storage facilities for additional mix ingredients at most RMX plants. Hanson told us that, if a secure source of available recycled or secondary materials were available on a medium- to long-term basis, the cost of investment in additional storage should not be difficult to justify. Cemex told us that recycled and secondary aggregates were suitable for production of RMX and provided an example of an independent RMX producer which used a combination of recycled and primary aggregates in its RMX production, as well as noting that Tarmac used secondary aggregates for RMX production. Cemex also told us that recycled aggregates might not always be suitable where high specification concrete was required, but that such circumstances were limited.

5.18 Secondly, we reviewed data from each Major on its own use of aggregates for its downstream activities (RMX, asphalt and, where applicable, concrete block production). These estimates are presented in Appendix 5.1. In general, the Majors used very little, if any, recycled and secondary aggregates for RMX, asphalt and concrete block production.<sup>11</sup> Commenting on this finding, a number of Majors noted that their own use of recycled and secondary aggregates was unlikely to be representative of the true opportunities for substitution because, as producers of primary aggregates, they had a strong incentive to use their own products in their downstream activities.<sup>12</sup>

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<sup>11</sup> Aggregate Industries told us that it was unable to specify what percentage of secondary and recycled aggregates it used for the production of asphalt, RMX and concrete products. It said that it was often the case that the recycled or secondary material would be provided by the customer as part of the supply agreement and therefore it was not recorded as a purchase.

<sup>12</sup> Lafarge noted that its own internal use of recycled and secondary aggregates was lower than, and was not representative of, the true levels of substitutability with primary aggregates that were in fact possible, because Lafarge was predominantly already heavily invested as a primary aggregates producer with spare capacity and therefore sought to use primary aggregates in its own downstream operations where possible. Similarly, Hanson told us that it was a primary aggregates producer and therefore was disincentivized to use secondary or recycled aggregates in its downstream activities. We noted that the same argument would apply to the other Majors which are also predominantly primary aggregate producers.

Some majors also noted recent developments which had led them to increase their usage of recycled and secondary aggregates in asphalt production in particular.<sup>13</sup>

5.19 Thirdly, we reviewed the results of a survey commissioned by the CC in the context of the Anglo–Lafarge JV inquiry from GfK (a market research company).<sup>14</sup> Details of this survey and of parties' comments about its findings are in Appendix 5.1, paragraphs 16 to 25. Overall, the survey results indicate that:

(a) For RMX production, there has been relatively limited switching to recycled and secondary aggregates and usage of these is low by RMX producers. However, there is some potential for increased usage of recycled and secondary aggregates (17 per cent of RMX producers could switch a quarter or more of their usage to recycled or secondary aggregates).

(b) For other construction uses (not including asphalt), use of recycled and secondary aggregates is much more prevalent, and half of these customers have switched in the past three years. There is some potential for further switching (26 per cent of customers could switch a quarter or more of their usage to recycled and secondary, and 27 per cent said that they could not switch but that this was because of lack of availability rather than for reasons linked to suitability).

5.20 Finally, we reviewed the comments on substitution between primary and recycled/secondary aggregates that were summarized in the Anglo–Lafarge JV inquiry report.<sup>15</sup> In general, these comments suggested that recycled and secondary aggregates could be used in place of primary aggregates in general construction for low-

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<sup>13</sup> Tarmac told us that it had increased the proportion of secondary and recycled aggregates it used in asphalt production. Lafarge also told us that it carried out some recycling. Furthermore, Lafarge told us that there were targets for the use of recycled asphalt planings (RAP) in the production of asphalt. RAP is taken from roads and other surfaces during the process of maintenance and reconstruction. It has additional value since its use reduces the volume of bitumen needed in the production of asphalt.

<sup>14</sup> The presentation by GfK on the survey is available on the CC website: [www.competition-commission.org.uk/assets/competitioncommission/docs/2011/anglo-american-lafarge/gfk\\_competitor\\_customer\\_survey\\_presentation.pdf](http://www.competition-commission.org.uk/assets/competitioncommission/docs/2011/anglo-american-lafarge/gfk_competitor_customer_survey_presentation.pdf).

<sup>15</sup> See [Anglo–Lafarge JV inquiry report](#), Appendix G, paragraphs 53–59.

specification applications, but that they were not generally used in high-specification applications. For RMX and concrete blocks, these comments suggested that recycled and secondary aggregates were not considered to be a close substitute for primary aggregates, but that there was more scope for using recycled and secondary aggregates in the production of asphalt.

5.21 Overall, the evidence shows that there has been a steady growth in the share of total aggregates sales accounted for by recycled and secondary aggregates over the past 20 years (as set out in Figure 5.1) , which suggests that over this period, significant volumes of recycled and secondary aggregates have, in practice, been substituted for primary aggregates.

5.22 The evidence also indicates that the extent of substitutability of recycled and secondary aggregates for primary aggregates varies significantly by application. Consideration of the different end-uses for aggregates suggests that while recycled and secondary aggregates are an imperfect substitute for primary aggregates, in that they could not entirely replace primary aggregates in all applications, they are nonetheless an effective substitute for a substantial part of the market (in particular for low-specification direct construction uses, where recycled and secondary aggregates account for almost a half of all aggregates used). Survey evidence (see paragraph 5.19(b)) also indicates that, for general construction uses, substitution has occurred in the past when prices of primary aggregates increased relative to recycled and secondary aggregates.<sup>16</sup> For the production of asphalt, the evidence summarized in paragraph 5.16(c) also suggests a relatively large usage of recycled and secondary aggregates (10 to 20 per cent of all aggregates used). For other uses (in particular, RMX and concrete block production), there seems to be more limited scope for

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<sup>16</sup> This is consistent with the overall increase in the share of recycled aggregates, which seems to be a result of the increasing cost of landfill as a result of the landfill tax, the increase in the aggregates levy and the growing awareness of the availability of recycled materials.

substitution, though we saw some evidence to indicate that recycled and secondary aggregates are increasingly being used for some relatively higher-specification applications.

*Conclusion on aggregates product market definition*

5.23 Table 5.1 summarizes our assessment of the scope for substitution between crushed rock and sand and gravel (as set out in paragraphs 5.8 to 5.11), and between primary and secondary/recycled aggregates (as set out in paragraphs 5.12 to 5.22), by application. For crushed rock and sand and gravel, the evidence indicates significant scope for substitution between different classes of aggregates for applications accounting for a substantial part of total aggregates sales, but with more limited scope for substitution for other applications. The evidence as to whether recycled and secondary aggregates are substitutes for primary aggregates is more balanced. There is significant scope for substitution between recycled and secondary aggregates and primary aggregates for about half of total aggregates sales and limited substitution for the remainder of total aggregates sales.

TABLE 5.1 **Extent of substitution between aggregates by application**

<i>Uses of aggregates</i>	<i>% of total aggregates usage</i>	<i>Substitutability primary/ recycled and secondary</i>	<i>Substitutability crushed rock/ sand and gravel</i>
<i>Use in manufacture of construction products</i>			
Manufacture of RMX	20	Limited	Yes—appear equivalent
Manufacture of concrete products, eg blocks, paving, precast structures, roof tiles	10	Limited	Yes—appear equivalent
Manufacture of asphalt	11	Some scope for substitution	Crushed rock appears generally more suitable but sand & gravel are also used in smaller proportions
<i>Direct construction uses</i>			
Mainly: non-structural fill, structural fill, capping layer, sub-base	50	Yes	Yes
Other (mainly, specialist uses)	8	No use of recycled	

Source: CC, based on data from Tarmac/BDS on proportions used in different applications.

5.24 In light of our assessment of substitutability and the overall purpose of market definition for this investigation (as set out in paragraph 5.1), we concluded that it was appropriate to define a relevant product market for all construction aggregates,

including crushed rock, sand and gravel and, on balance, recycled and secondary aggregates. For the reasons set out in paragraph 5.6(a), we have not defined separate product markets for different grades of aggregates and we have excluded specialist aggregates, such as rail ballast and HPL, from the scope of our product market definition.

- 5.25 Our competitive assessment of aggregates markets in Section 6 takes into account the fact that substitutability varies significantly by application and in particular that:
- (a) sand and gravel aggregates are not as widely used in asphalt applications as crushed rock aggregates; and
  - (b) recycled and secondary aggregates are likely to be a close substitute to primary aggregates for lower-specification construction applications, but they are less substitutable for RMX and concrete block production.
- 5.26 We note that this relevant product market definition is different from the definition that was used in the CC's Anglo–Lafarge JV inquiry report (in which recycled and secondary aggregates were considered to be outside the market for primary aggregates used for construction purposes). In that report, the analysis of the competitive effects in aggregates markets focused mainly on an assessment of the conditions of competition in the local areas in which the parties to the JV both had primary aggregates sites ('overlap areas'). This assessment also took into account the competitive constraint from outside the market resulting from the existence of local sources of recycled and secondary aggregates in the relevant overlap areas.<sup>17</sup>
- 5.27 In this market investigation, our analysis of aggregates markets is focused on competition in the sector as a whole rather than examining it in specific overlap areas. Therefore we considered it more appropriate to use a wider market definition which

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<sup>17</sup> See [Anglo–Lafarge JV inquiry report](#), paragraphs 23 & 24.

includes recycled and secondary aggregates in the relevant product market and to take into account as part of our competitive assessment:

- (a) the constraint from secondary and recycled aggregates when these are present in a given geographic market; and
- (b) the fact that recycled and secondary aggregates may not be a constraint on primary aggregates for some applications.

### *Geographic scope of competition*

5.28 The consensus view among parties was that aggregates markets were local, although views varied on the precise geographic scope and the appropriate catchment areas to use for competitive analysis. Tarmac told us that, as a starting point for the competitive assessment, 30 miles around a quarry was a reasonable catchment area,<sup>18</sup> whereas Aggregate Industries and Cemex told us that the geographical markets tended to be larger than 30 miles.<sup>19</sup> Details of parties' views about the geographic scope of aggregates markets may be found in Appendix 5.1.

5.29 We were told that catchment areas could depend on demographics and other factors that varied locally.<sup>20</sup> We also noted that some aggregates are transported around the UK by rail, and occasionally by ship, and as a consequence catchment areas for rail- and sea-linked quarries are likely to be much larger than catchment areas for quarries that are not rail- or sea-linked. Rail-linked quarries need to be connected to a depot at the other end of the rail link in order to sell aggregates into a local area at the end of that link, and therefore these quarries are likely to be in competition with other quarries located in the catchment area of the depots which they feed.

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<sup>18</sup> [Tarmac reply to the issues statement](#).

<sup>19</sup> [Cemex and Aggregate Industries reply to the issues statement](#).

<sup>20</sup> For example, Cemex told us that local markets would vary in scope and scale due to demographics (different concentration of demand in rural as against urban areas) and topographic features, as a result of which each market should, according to Cemex, be defined on its own terms.

5.30 We concluded that aggregates markets were local in nature, but that their precise geographic specification could vary according to a variety of local factors. The geographic dimension of competition is relevant to our competitive assessment of aggregates markets—that is, we need to take into account all the competitive constraints in local areas. We therefore analyse catchment areas for aggregates in Section 6.

### **Cement**

5.31 We set out below our consideration of market definition in relation to cement, both in terms of the product market definition and the geographic scope of the market.

#### *Product market definition*

5.32 In the Anglo–Lafarge investigation, the CC considered the extent of demand-side (and where appropriate, supply-side) substitutability between:

- (a) different types of (bulk) cement (ie CEM I, CEM II and CEM III);
- (b) different forms of packaging of cement (ie bulk cement and bagged cement); and
- (c) domestically-produced and imported cement.

5.33 In relation to the first issue, the CC found that there was a degree of demand-side substitutability between cement types, but that the ability and willingness of customers to switch from CEM I to other types of cement differed depending on the application. In relation to supply-side substitution, the CC found that cement producers appeared to have different abilities to source the various cementitious products which are required to produce CEM II and CEM III (ie PFA and GGBS). Subject to the availability of these products, and provided that the required facilities were in place, producers appeared to be able to switch the production easily from CEM I to other types of cement. The CC concluded that, for the purposes of assessing the Anglo–Lafarge JV, all types of (bulk) cement formed part of the same relevant prod-

uct market, though, in the competitive assessment, it also considered the competitive constraints arising for CEM I separately.

- 5.34 In relation to the second issue, the CC found that there was very little, if any, demand-side substitutability between bulk and bagged cement. On that basis, the CC concluded that for the purposes of assessing the Anglo–Lafarge JV, bulk and bagged cement belonged to different relevant product markets.
- 5.35 In relation to the third issue, the CC examined the extent to which domestically-produced and imported cement were substitutes for each other. Given that the majority of imported cement is bulk cement, the CC focused on the constraints placed by imported bulk cement on domestic bulk cement rather than on bagged cement. We found that, in relation to consideration of the Anglo–Lafarge JV, it was not appropriate to segment the relevant product market into domestic and imported cement on the basis of quality or security of supply differences.
- 5.36 We asked parties for their views on whether the approach taken to product market definition for cement in the Anglo–Lafarge JV report was also relevant for this market investigation. In their replies to our issues statement, Lafarge, Tarmac and Cemex told us that they generally agreed with the approach to cement market definition in the Anglo–Lafarge JV report. Hanson and Aggregate Industries did not comment on cement market definition in their responses to the issues statement.
- 5.37 The main points of detail raised by parties regarding the definition of the relevant markets for cement were as follows:

- (a) Lafarge submitted that the relevant market was all grey cement.<sup>21</sup> It did not comment on whether bagged or bulk cement should be defined as separate markets (but this was the view it put forward during the Anglo–Lafarge JV inquiry). Lafarge also argued<sup>22</sup> that additions such as PFA and GGBS should be included in the market for bulk cement since they were directly substitutable for clinker in various proportions.
- (b) Tarmac told us that all types and grades of cement were in the same market because they were demand- and supply-side substitutes, that bagged and bulk cement could be considered to be in separate markets because of lack of any substitution from the demand side, and that imported cement was in the same product market as cement produced in GB.
- (c) Cemex told us that there was a single product market for grey cement, with all available grades and specifications forming a single continuum of customer demand. According to Cemex, there was also extensive supply-side substitution, because most British cement production sites had the necessary milling, blending and storage facilities to be able to adjust production between CEM I, II and III. Cemex told us that, regardless of whether or not bulk and bagged cement comprised a single market or two separate markets, the majority of cement producers could produce and sell cement in either form after making a relatively inexpensive investment in bagging machinery.
- (d) Cemex also told us that PFA and GGBS posed a significant competitive constraint on grey cements, even though they could not be used on a stand-alone basis as a direct substitute for cement. According to Cemex, this was because many RMX and concrete product producers (including sites owned by Cemex) purchased PFA and GGBS directly and ‘self-blended’ CEM II or III as required. For example, in relation to Cemex’s own RMX production, Cemex told us that

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<sup>21</sup> We understand that all the cement produced in GB is grey cement.

<sup>22</sup> [Lafarge response to updated issues statement](#).

purchases of GGBS and PFA comprised [X] per cent and [X] per cent respectively of total purchases of cementitious products. It said that, as a consequence, any assessment of the relevant market for cement would be misleading and incomplete without a full consideration of these products.

(e) Cemex told us that imported cement and cement produced in GB were in the same product market

5.38 In conclusion, among those parties that expressed views, there appears to be broad agreement with the approach taken to the product market definition for cement used in the Anglo–Lafarge JV inquiry (as set out in paragraphs 5.32 to 5.35 above) and we therefore saw no reason to depart from that approach in this investigation. We therefore concluded that the product market for the purposes of this investigation should be defined as follows:

(a) CEM I, CEM II and CEM III are in the same relevant product market, given the extent of demand- and supply-side substitution between different types of cement.

(b) Bagged cement and bulk cement can be defined as separate markets because they are bought by different types of customers (ie there is very little demand-side substitution). There is scope for supply-side substitution between bagged and bulk cement, though this would be limited in relation to those cement producers who do not have a bagging facility.

(c) Imported cement and cement produced in GB are in the same relevant product market.

5.39 We noted, however, the submissions by Cemex and Lafarge that, given that GGBS and PFA are inputs to the production of blended cements such as CEM II and CEM III, the analysis of competition in the market for grey cement should also take into

account the role played by GGBS and PFA in that market. We consider this issue further in Sections 7 and 8.

### *Geographic scope of competition*

5.40 Although the Anglo–Lafarge JV report did not conclude specifically on the geographic scope of cement markets, the competitive assessment in that report focused on GB, while also assessing the constraints within GB from imported cement. We did not receive any comments that disagreed with this overall approach:

- (a) Tarmac submitted that the geographic market was at least national.
- (b) Cemex submitted that the relevant geographic market for the supply of cement comprised at least GB. Cemex noted that Cemex and its competitors were able to serve customers across this territory from only a few plants, from which cement was transported to wherever it was required.

5.41 We concluded that for the purposes of this investigation, we would focus primarily on competition at a GB level, taking into account the constraints from imported cement as part of our competitive assessment in Section 8.

### ***RMX***

5.42 We summarize below our consideration of market definition in relation to RMX, both in terms of the product market definition and the geographic scope of RMX markets.

### *Product market definition*

5.43 In the Anglo–Lafarge JV report, the CC concluded that:

- (a) all specifications of RMX should be considered to form part of the same relevant product market; and that
- (b) the relevant product market included all RMX produced in fixed and site plants, but not concrete produced by means of volumetric trucks.

- 5.44 The main reasons for (a) were that although there are many different specifications of RMX, corresponding to different mixes of the ingredients, the same RMX plant will typically manufacture the full range of standard RMX mixes on any given day. As a result, with a few exceptions,<sup>23</sup> switching between these mixes will normally take place on a daily basis.
- 5.45 The main reasons for (b) were that volumetric trucks appeared to serve a different segment of the market (small-volume projects) and because the product was perceived to be of a lower quality of specification and strength by the majority of parties that were contacted by the CC during the Anglo–Lafarge JV inquiry.
- 5.46 Although there are many different specifications of RMX, corresponding to different mixes of the ingredients, at the same RMX plant the full range of standard RMX mixes will typically be manufactured on any given day. As a result, with a few exceptions,<sup>24</sup> switching between these mixes will normally take place on a daily basis. Therefore, we concluded that all specifications of RMX should be considered to form part of the same relevant product market.
- 5.47 During our investigation, a number of parties submitted arguments and evidence to the effect that, for the purpose of our market investigation, we should use a wider relevant product market for RMX that included concrete from volumetric, fixed and site plants. A summary of the parties' submissions and the evidence we considered on this issue is in Appendix 5.2.
- 5.48 The main questions we considered relating to RMX product market definition were:

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<sup>23</sup> One of these exceptions is that some value-added RMX products may require additional equipment such as a pan mixer or an anhydrite silo.

<sup>24</sup> See previous footnote.

(a) whether concrete delivered and produced by volumetric trucks was a substitute for RMX produced at fixed plants; and

(b) whether concrete produced at site plants was a substitute for RMX produced at fixed plants.

5.49 Overall, the evidence, taken as a whole, suggested to us that volumetric trucks are a substitute for RMX from fixed plants for relatively small projects. There has generally been less use of volumetric trucks on larger projects, though there is some recent evidence that volumetric trucks are also now being used on some larger projects. The internal documents provided to this investigation suggest that volumetric trucks are perceived as a threat by some Majors, and survey evidence shows that many RMX customers have used volumetric trucks in the past (55 per cent). Site plants appear to be suitable only for very large projects and therefore are likely to be a constraint on fixed RMX plants for the largest projects.

5.50 In light of this assessment and taking into account the overall role of market definition in this investigation (as set out in paragraph 5.1), we concluded that we should include concrete from volumetric trucks, site plants and fixed plants within our definition of the relevant product market for RMX.<sup>25</sup> In our competitive assessment of RMX in Section 9, we consider (among other things) the strength of rivalry between volumetric trucks and site plants on one hand and fixed plants on the other.

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<sup>25</sup> We note that concrete from volumetric trucks was not included in the relevant market definition in the Anglo–Lafarge JV report (in which the relevant market included RMX produced at fixed sites, mobile plants and site plants, but not concrete from volumetric trucks). However, the local competition assessment for RMX in that report, which focused on areas where the parties to the JV both had RMX sites, took account of possible constraints from local volumetric truck operators (see paragraph 33 of the [Anglo–Lafarge JV report](#)). For reasons analogous to those set out in paragraphs 5.26 and 5.27 above, for the purposes of this market investigation, we propose to use a wider market definition which includes concrete from volumetric trucks. We also note the additional evidence submitted to us in this market investigation in relation to the constraint from volumetric trucks on producers of RMX.

### *Geographic scope of competition*

- 5.51 Given that RMX must be used within 1 to 2 hours of being produced, there is broad consensus that the markets are local (catchment areas are typically within about 8 to 10 miles of RMX plants). We noted, however, that volumetric trucks may deliver over greater distances than conventional mixer trucks dispatched from fixed plants since concrete from volumetric trucks can be mixed 'on-site'.
- 5.52 We therefore concluded that RMX markets were highly localized in nature, with catchment areas in the region of about 8 to 10 miles of RMX plants, albeit with some scope for variation in catchment area according to local factors and the means available for distributing the concrete (ie via volumetric trucks or conventional mixer trucks).

### ***Summary of conclusions on market definition***

- 5.53 We concluded that the appropriate market definitions for the purposes of our investigation were as follows:
- (a) In relation to aggregates, we have defined a single relevant product market for all construction aggregates, including crushed rock and sand and gravel aggregates as well as recycled and secondary aggregates. We have not defined separate product markets for different grades of aggregates. We have found that different types of specialist aggregates, such as rail ballast and HPL, are in separate product markets from each other and from construction aggregates. The geographic scope of aggregates markets is local in nature, with the precise geographic specification varying according to a variety of local factors. We analyse catchment areas for aggregates in our competitive assessment of aggregates in Section 6.
- (b) We have defined a single relevant product market for bulk grey cement including different types of cement (ie CEM I, CEM II, CEM III etc) and imported and GB-produced cement. We have defined bagged cement as a separate product

market. We will also take into account the role played by GGBS and PFA in the market for grey cement. In terms of geographic scope, we have focused primarily on competition at a GB level, taking into account the constraints from imported cement as part of our competitive assessment in Section 8.

- (c) In relation to RMX, we defined a single relevant product market including all specifications of RMX as well as RMX supplied from fixed plants and site plants and concrete supplied from volumetric trucks. We found that RMX markets were highly localized in nature, with narrow catchment areas within about 8 to 10 miles of RMX plants, albeit with some scope for variation in catchment area according to local factors and the means of distribution.

## **6. Competitive assessment: aggregates**

### ***Introduction***

- 6.1 As set out in paragraph 5.24, we have defined a single relevant product market for all construction aggregates, including crushed rock and sand and gravel aggregates as well as recycled and secondary aggregates. We have not defined separate product markets for different grades of aggregates. We have found that different types of specialist aggregates, such as rail ballast and HPL, are in separate product markets from each other and from construction aggregates. Further, we have found that the geographic scope of aggregates markets is local in nature, with the precise geographic specification varying according to a variety of local factors.
- 6.2 In this section, we set out our assessment of whether there are features of this market that give rise to one or more AECs through unilateral market power or coordination (see paragraph 4.20). As explained in Section 4, much evidence is relevant to consideration of both unilateral market power and coordination and we therefore present our assessment of the scope for unilateral market power and coordination together in a single section of this report.
- 6.3 Because geographic markets for construction aggregates are local, the ability of firms to exercise unilateral market power or to coordinate is likely to vary depending on the competitive conditions in different local areas. For instance, some local areas may have higher concentration levels than others, leading to more possible concerns relating to unilateral effects or coordination. Therefore, much of our competitive assessment of the aggregates markets focused on understanding the geographical scope of local aggregates markets, the identity of suppliers and level of concentration in these markets, and on comparing outcomes across local markets to analyse whether there were any widespread features of the GB aggregates markets that give

rise to one or more AECs through the exercise of unilateral market power or coordination.

6.4 Paragraphs 4.25 and 4.28 contain key extracts from the Guidelines on how the CC will conduct its assessment of unilateral market power and coordination. In light of the Guidelines, to conduct our assessment of whether unilateral market power or coordination may be giving rise to one or more AECs in GB aggregates markets, in this section we analyse:

- (a) aspects of market structure;
- (b) market outcomes;
- (c) conduct in the market; and
- (d) the impact of recent market developments (see paragraphs 4.35 to 4.37).

6.5 We conclude this section by setting out our competitive assessment of the GB aggregates markets in light of this analysis.

6.6 As we stated in our updated issues statement (see paragraph 1.24), we did not receive any specific submissions regarding competition issues in the markets for specialist aggregates, nor did we become aware of any such concerns during the course of our information gathering and analysis for this investigation more broadly. Given this lack of concern regarding competition problems in relation to specialist aggregates, and the constraints on the time and resources available for our investigation overall, we did not prioritize further work on specialist aggregates.<sup>1</sup> While we have not found evidence in this investigation of features giving rise to an AEC in any such market, we make no finding as to whether or not there are competition problems in particular specialist aggregates markets. We do not consider specialist aggregates further in this report.

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<sup>1</sup> This approach is supported by [paragraph 36](#) of the Guidelines—see paragraph 4.5.

## ***Market structure***

6.7 In this subsection, we look at several aspects of the structure of aggregates markets in GB:

- (a) We explore shares of supply at GB level.
- (b) We present our analysis of the degree of market concentration at a local level, which relies on a 'catchment area analysis' to understand the extent of geographic markets for aggregates.
- (c) We describe the characteristics of aggregates customers and their purchasing behaviour.
- (d) We set out the extent of vertical integration at a national level from aggregates production into downstream operations.
- (e) We explore the extent of barriers to entry and expansion in aggregates markets.
- (f) We describe other relevant aspects of market structure.

### ***GB shares of supply***

6.8 Whilst aggregates markets are local (see paragraph 5.30), we examined shares of supply of primary construction aggregates in GB as a whole to understand the position of the key market players overall.

6.9 Table 6.1 shows the pre-2013 Majors' shares of supply of primary aggregates in GB (ie before the creation of Lafarge Tarmac and the entry of HCM into the relevant markets), alongside the total share of supply held by the non-Majors. Figures for MQP are shown separately to take account of the fact that it was a 50:50 JV between Hanson and Tarmac (see paragraph 1.19). The table shows that the pre-2013 Majors collectively supplied 69 per cent of aggregates in GB, based on 2011 volumes.

TABLE 6.1 **Pre-2013 Majors' and non-Majors' shares of supply of aggregates in GB**

	<i>Aggregate Industries</i>	<i>Cemex</i>	<i>Hanson (excl 50% in MQP)</i>	<i>Lafarge</i>	<i>Tarmac (excl 50% in MQP)</i>	<i>MQP</i>	<i>Total pre-2013 Majors (incl MQP)</i>	<i>Total non-Majors</i>
Total GB	[X]	[X]	[X]	[X]	[X]	[X]	69	31

Source: CC analysis based on data from the Majors, some non-Majors, and BDS.

6.10 Table 6.2 shows the 2013 Majors' shares of supply of aggregates in GB (ie following the creation of Lafarge Tarmac, the entry of HCM into the relevant markets and the acquisition by Hanson of the 50 per cent of MQP that it did not already own—see paragraph 1.19), alongside the total share of supply held by the non-Majors. The table shows that the 2013 Majors collectively supply 69 per cent of aggregates in GB. In addition, Lafarge Tarmac is now, by some margin, the largest producer of aggregates in GB. HCM is a relatively small player in GB aggregates markets taken as a whole.

TABLE 6.2 **2013 Majors' and non-Majors' shares of supply of aggregates in GB**

	<i>Aggregate Industries</i>	<i>Cemex</i>	<i>Hanson</i>	<i>Lafarge Tarmac</i>	<i>HCM</i>	<i>Total Majors</i>	<i>Total non-Majors</i>
Total GB	[X]	[X]	[X]	[X]	[X]	69	31

Source: CC analysis based on data from the Majors, some non-Majors, and BDS.

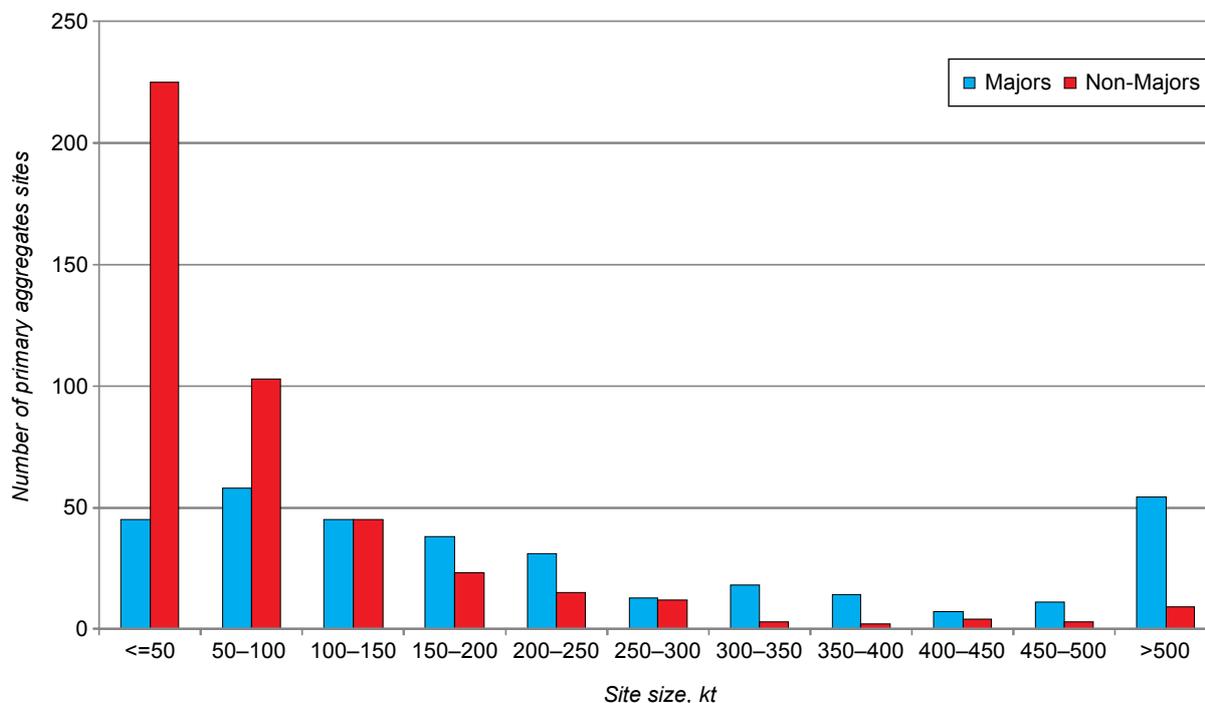
6.11 There were around 234 non-Major aggregates suppliers in GB in 2011, operating around 444 primary aggregates sites (quarries and wharves).<sup>2</sup> Most independent producers are small, with many operating only one site (two sites on average); in comparison the five Majors operated 334 sites collectively. As described in Sections 2 and 3, there are a number of mid-tier aggregates suppliers, which each operate a number of sites in regional markets (for example, Leiths in Scotland, Marshalls in the North, Breedon in Scotland and the Midlands, Brett in the Eastern and the South-East regions). Non-Majors' sites tend to be smaller than Majors' sites on average;

<sup>2</sup> Source: BDS.

Figure 6.1 shows that most of the aggregates sites supplying less than 100 kt in 2011 were operated by non-Majors, whereas the larger sites tend to be operated by the Majors.

FIGURE 6.1

**Sizes of primary aggregates sites in GB: Majors versus non-Majors, 2011**



Source: CC analysis of BDS data.

*Catchment area analysis and market concentration at local level for aggregates*

*Catchment areas*

6.12 Having found that aggregates markets were local (see paragraph 5.30), we undertook a catchment area analysis to help us understand the extent of such geographic markets (ie what 'local' meant in practice).<sup>3</sup> We describe our methodology in Appendix 6.1. The results of this analysis fed into our assessment of concentration in local aggregates markets (see paragraphs 6.17 to 6.19), our price-concentration analysis (PCA) (see paragraphs 6.89 to 6.91) and our entry and exit analysis (E&EA) (see paragraphs 6.92 to 6.96).

<sup>3</sup> For this analysis, our focus is on sales of primary construction aggregates by the pre-2013 Majors. All references to the Majors in the context of our catchment area analysis are references to the pre-2013 Majors.

- 6.13 Parties to the investigation told us that aggregates markets were local, and that they extended to about 30 miles or more around quarries.<sup>4</sup> Our analysis focused on sales delivered to external customers (ie customers other than parties' own downstream businesses or depots), and found that 80 per cent of sales volumes of primary aggregates were transported up to around 19 miles (straight-line) in urban areas and up to around 28 miles in non-urban areas on average. These figures are 80 per cent catchment area distances averaged across the four Majors for which data was available, focusing on the final leg of delivery. We used these averages (rounded to 20 miles and 28 miles) in our assessment of the concentration of local markets and in our PCA and E&EA.
- 6.14 We found that there was considerable variation in catchment areas across suppliers, products, and aggregates sites, as a great number of factors influenced the distances over which aggregates were delivered to customers. For example, catchment areas for higher-specification products tended to be significantly larger than those of lower-specification aggregates, such as recycled aggregates and sub-bases and fills. Catchment areas of sites located in urban areas tend to be smaller than catchment areas of non-urban sites. We found that catchment areas for internal sales were larger than for external sales. Our analysis suggested that the 30-mile figure mentioned by parties in relation to the geographical extent of aggregates markets was more representative of 90 per cent catchment areas.
- 6.15 In comments on the catchment area analysis and PCA and E&EA analysis, one of the main concerns expressed by some parties related to the distinction we made between urban site and non-urban site catchment areas. We carried out further sensitivity checks on our catchment area analysis, and found that the average 80 per cent catchment area distance for primary construction aggregates was

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<sup>4</sup> See paragraph 5.28.

24 miles across all aggregates sites we analysed, irrespective of whether we classified them as urban or non-urban.

- 6.16 Further details of the results of our catchment area analysis, and the sensitivity checks we undertook, are in Appendix 6.1.

*Concentration in local aggregates markets*

- 6.17 We looked at the alternative sources of aggregates available to customers within the 80 per cent catchment area around their 'job sites' (ie the locations where aggregates were used). We looked at concentration in terms of the number of plants, the number of different suppliers and market share (by volume) held by the largest supplier,<sup>5</sup> the largest four suppliers<sup>6</sup> and the five pre-2013 Majors. We used data on the location of aggregates plants and primary construction aggregates sales from 2011, and on customer job sites for delivered sales from the three pre-2013 Majors for which this data was available. The details of our assessment of concentration in local aggregates markets are in Appendix 6.7.

- 6.18 We found that [nearly all] job sites where aggregates were purchased and delivered in 2011 had a choice of more than five aggregates plants within the 80 per cent catchment area distance around those sites. We also found that 90 per cent of job sites had a choice of more than five different suppliers within that distance.
- Therefore, it appears that most aggregates customers have some degree of choice of supplier.

- 6.19 When we considered market shares around job sites rather than simply the number of plants or competitors, we found evidence of high concentration in some local aggregates markets:

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<sup>5</sup> This is known as the C1 concentration ratio.

<sup>6</sup> This is known as the C4 concentration ratio.

- (a) in the catchment areas around 11 per cent of job sites, the largest company had a market share (by 2011 sales volume) of more than 50 per cent;
- (b) in the catchment areas around 22 per cent of job sites, the four largest companies collectively had a market share of more than 90 per cent; and
- (c) in the catchment areas around approximately 11 per cent of job sites, the pre-2013 Majors collectively had a market share of 90 per cent or more.

### *Characteristics of the product, customers and purchasing behaviour*

6.20 The characteristics of the product, of the customers and the purchasing behaviour of customers may have an impact on the amount of transparency in the market and on the incentives of aggregate producers to compete, and are therefore relevant to our analysis of competition in the aggregates markets. For instance, if there is a high degree of product differentiation, this is likely to reduce the transparency in the market and may be a factor that makes coordination less likely. Also, the way in which customers purchase aggregates (eg whether they go through formal tenders, or long-term contracts, or tend to purchase aggregates ad hoc) is also likely to impact the way in which competition between aggregate producers takes place.

### *Characteristics of the product*

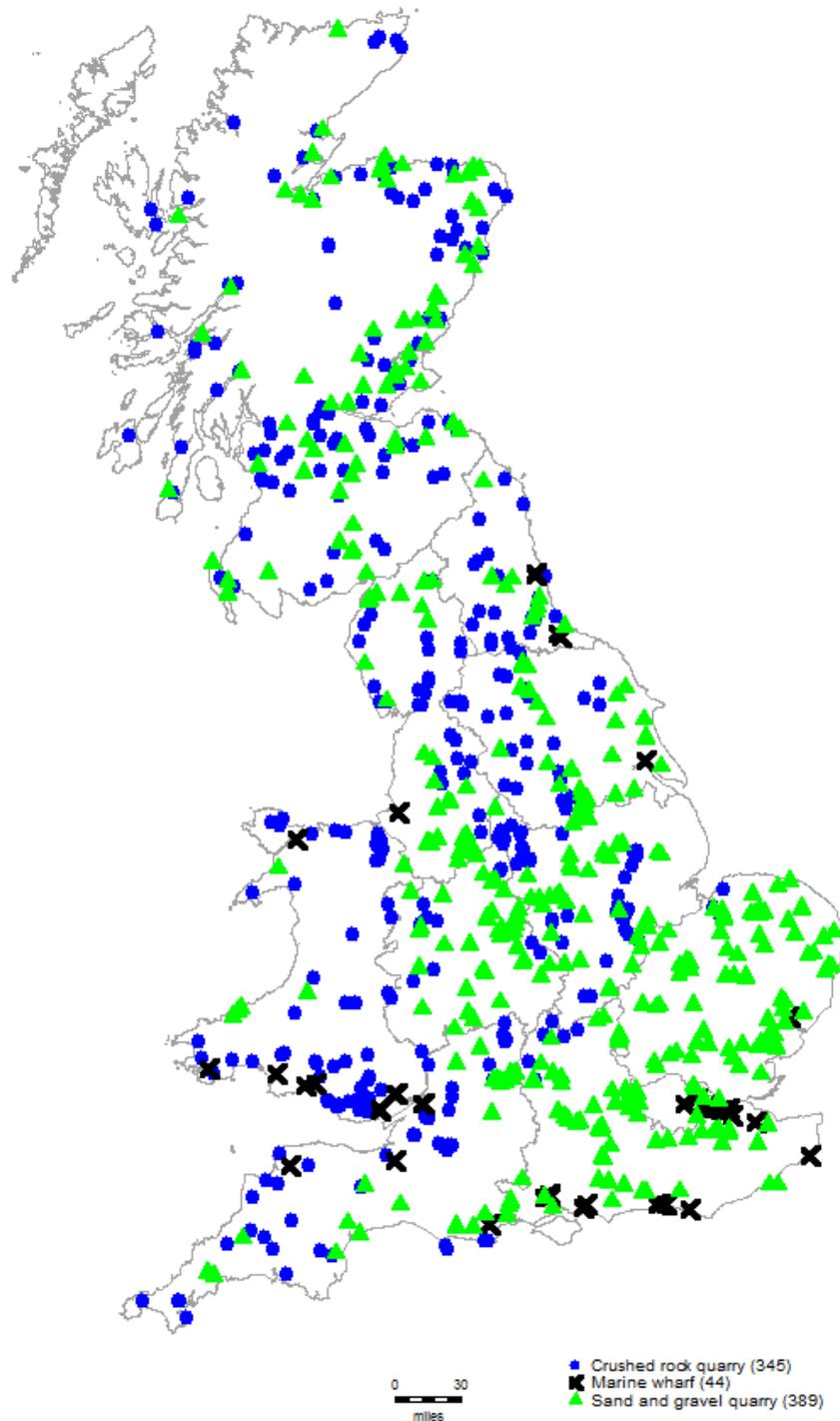
6.21 There are different sub-types of aggregates products in terms of their origin (eg primary, secondary, recycled), geological composition or properties (eg sand, gravel, different types of rock), and grade (eg fine, coarse, graded/mixed) (see paragraphs 2.5 to 2.10). This means that there is a degree of product differentiation, although this is limited by the extent of demand- and supply-side substitutability (see paragraphs 5.5 to 5.27 on product market definition for aggregates). Moreover, aggregates within each sub-type are relatively homogeneous, and might be subject to regulations, such as specifications for highway works (eg sub-bases and fills, crushed rock for asphalt production) and/or BS/EN standards (eg aggregates for RMX and asphalt produc-

tion). Thus, in addition to a degree of substitutability of different aggregates sub-types, within each sub-type the aggregates produced by different suppliers are largely homogeneous from a product perspective.

6.22 There is geographic differentiation of aggregates, since points of supply of aggregates (ie quarries, depots, marine wharves) are located at various addresses and thus at various distances to customers. Availability of different types of aggregates (eg sand and gravel versus crushed rock) also varies across GB. As an illustration, Figure 6.2 shows locations of primary aggregates quarries in GB in 2011. Since transport costs relative to the value of aggregates can be important, this means that, for a given aggregate product, distance between supplier sites and customer sites is a factor differentiating suppliers (eg customers may prefer suppliers located closer to their sites). Our competitive assessment for aggregates therefore takes account of this product (ie between aggregate sub-types) and geographic differentiation.

FIGURE 6.2

**Locations of primary aggregates quarries and wharves in GB, 2011**



Source: CC analysis of BDS data.

*Characteristics of customers and purchasing behaviour*

6.23 Many types of customers make aggregate purchases, with the purpose of using aggregates as an input into RMX, concrete products and asphalt and/or using

aggregates for end-use (such as sub-base/fills), or for onward distribution to end-consumers. These customers broadly include the following:

- (a) building contractors and subcontractors;
- (b) public sector direct customers, such as local authority districts and the Highways Agency, purchasing aggregates for highway maintenance;
- (c) builders' merchants, purchasing aggregates (including bagged aggregates) for onwards sale to end-consumers (examples include Travis Perkins, Jewson);
- (d) customers with fixed points of consumption—these are customers who operate RMX plants, concrete products factory or asphalt plants (this includes own downstream businesses and those of other operators); and
- (e) casual customers or 'cash sale customers', who make one-off purchases directly from the quarry sites.

6.24 The number of the Majors' aggregates customers in any given year measures in thousands. However, as Table 6.3 below shows for three of the Majors, a relatively small number of customers make the majority of aggregates purchases. Depending on the major, the largest ten customers accounted for between 27 and 40 per cent of primary construction aggregates sales to external customers and own JVs in 2011. The largest 100 customers accounted for between 61 and 76 per cent of sales. We note, however, that the customer base may be more or less fragmented on local or regional level, and that this may vary from one local area to another. Majors' largest customers include other Majors, RMX, asphalt, and concrete products companies (such as Euromix, Breedon, Brett, Marshalls), large construction companies (such as Balfour Beatty, BAM), and large builders' merchants (such as Travis Perkins).

TABLE 6.3 **Majors' sales of primary construction aggregates to largest customers, 2011**

<i>Customer type/size</i>	<i>Hanson</i>	<i>Lafarge</i>	<i>Tarmac</i>
<i>Volumes (kt)</i>			
Sales to top 10 customers	[REDACTED]	[REDACTED]	[REDACTED]
Sales to top 50 customers	[REDACTED]	[REDACTED]	[REDACTED]
Sales to top 100 customers	[REDACTED]	[REDACTED]	[REDACTED]
Total external sales	[REDACTED]	[REDACTED]	[REDACTED]
<i>Proportion of total sales (%)</i>			
Sales to top 10 customers	[REDACTED]	[REDACTED]	[REDACTED]
Sales to top 50 customers	[REDACTED]	[REDACTED]	[REDACTED]
Sales to top 100 customers	[REDACTED]	[REDACTED]	[REDACTED]

Source: CC analysis of Majors' transaction data.

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Note: Includes delivered and collected sales of primary construction aggregates to external customers and own JVs.

6.25 The way purchases of aggregates are made and prices are negotiated varies across types of customers and/or projects. Broadly, purchases of aggregates can be from four potential channels: major projects, non-major projects, fixed points of consumption, and casual one-off purchases. With the exception of casual purchases or cash sales, for which price lists are used for setting the prices and which represent a small fraction of Majors' sales of aggregates, prices are bilaterally negotiated and/or set through informal or formal tenders or agreements. Internal guide prices and discounts (which are typically set on a regional basis) or prevailing prices of existing supply arrangements are usual starting points for quotes and price negotiations with customers. We were told that long-term contracts or supply agreements were relatively rare, and that prices could be renegotiated at least annually:

- (a) [REDACTED] told us that major projects, which were tendered either through construction contractors or directly to material producers, were bid through a competitive formal tender process. For non-major projects, formal tenders were less common, and contracts for the supply of aggregates were negotiated on a bilateral basis, tended to be short in duration (a few months) and tended to be project-based. It told us that it entered into non-exclusive supply agreements with fixed points of consumption customers (such as RMX or asphalt producers); it said that these were normally of 12 months' duration. It noted that these cus-

tomers were market experts who would switch suppliers if there was a breakdown in the relationship over quality, service or pricing.

- (b) [X] told us that it secured the majority of its aggregates orders through formal tenders and through informal tenders, where customers called a number of suppliers for quotes. [X] told us that its initial quote was based on regional pricing tools, which took into account the local market conditions, and that the final price paid by customers normally included a negotiated discount.
- (c) Hanson told us that the majority of its aggregates sales were to contract customers, account customers and spot customers, and that supplies won through a formal tender process were only a small proportion of its sales. Hanson told us that the majority of its sales took place after more informal tender processes where customers regularly sought multiple quotations from various suppliers. Contract customers, which could be large or fixed-plant customers, had a term contract with Hanson lasting more than 12 months, with a pricing formula negotiated and agreed in order to limit the scope for price renegotiations during the term of the contract. Account customers, which may also include fixed-plant customers, had agreed formal or informal pricing contracts with Hanson, lasting a year or less, with prices being renegotiated on an annual or more frequent basis. Hanson explained that its spot customers tended to agree prices on a project-by-project basis, and that prices were generally negotiated using internal pricing grid mechanisms or informal tenders.
- (d) Lafarge told us that most of its customers were either fixed outlet customers or were acquired on a job-by-job basis through an informal tender/quoting process; purchases of aggregates acquired through a formal tender process were rare. Lafarge told us that prices for projects were individually negotiated with customers on job-by-job basis, and that Lafarge internal price guides provided a starting point for initial quotes. Lafarge told us that prices for fixed outlet customers were negotiated annually, and that pre-existing prices formed the starting

point for price negotiations. For new fixed outlet customers, the price quoted would be determined by the internal price guides and prices charged to similar customers in the same area. Lafarge submitted that it had a number of long-term agreements (lasting 5 to 20 years) for the supply of aggregates,<sup>7</sup> and that prices were set at the commencement of the contract with agreed annual indexation; long-term supply arrangements to Lafarge's downstream JVs were subject to annual price negotiations.

(e) Tarmac told us that formal tenders were received in relation to work in the public sector or in relation to large contracts, and that prices were set through sealed bids or detailed negotiations. It said that written and verbal customer enquiries were the basis for the majority of price quotations it issued. It told us that it calculated initial prices taking into account factors such as job size and transport costs, and these prices were then subject to negotiations on discounts. Prices were set on the commencement of a contract, and longer-term or high-volume contracts had an agreed price escalation mechanism, such as indexation.

### *Vertical integration from aggregates into downstream operations*

6.26 Major GB aggregates suppliers are vertically integrated in that a significant proportion of their aggregates sales are to their own downstream RMX, asphalt, concrete products and other businesses. As set out in Appendix 2.3, Table 3, the proportion of sales of aggregates by Majors to their own downstream businesses was between 33 and 49 per cent in 2011 (depending on the Major). Our estimates also show that Majors' RMX, asphalt and concrete product downstream businesses sourced between 80 and 93 per cent of their aggregate requirements internally in 2011, although this varied between suppliers and the activity of downstream businesses (see Appendix 2.3, Table 4).

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<sup>7</sup> Lafarge noted that these long-term agreements largely related to non-construction (ie specialist) aggregates).

- 6.27 Many of the non-Major aggregates suppliers are also vertically integrated into RMX, asphalt or concrete products:
- (a) BDS estimated that around 33 per cent of independent RMX companies (ie excluding the Majors and some mid-tiers, such as Breedon and Brett) were sourcing aggregates internally in 2010;<sup>8</sup> and
  - (b) of the 20 top independent suppliers of aggregates (according to BDS 2011 data), at least 13 had RMX operations, 7 had asphalt operations, and 5 had concrete products operations.
- 6.28 For both Major and non-Major suppliers of aggregates, the extent of vertical integration into downstream products may vary across local markets. However, we have not undertaken further analysis of the extent of vertical integration of aggregates into downstream operations on local or regional level because this was unlikely to impact our competitive assessment for the supply of aggregates in GB.

### *Barriers to entry and expansion*

- 6.29 In the following paragraphs, we consider potential barriers to entry and expansion in relation to the supply of (a) primary land-won aggregates; (b) marine aggregates; and (c) recycled and secondary aggregates. Further details of our analysis of barriers to entry and expansion are presented in Appendix 6.2.

#### *Primary land-won aggregates*

- *Possible modes of entry and expansion*

- 6.30 We identified the following possible modes of entry and expansion for the production of primary aggregates:
- (a) developing or expanding a land-based aggregates site; and
  - (b) developing or expanding an import operation.

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<sup>8</sup> BDS (2011), 'Aggregates supplies to ready mixed concrete plants', Table 1.

6.31 Imports of aggregates from outside GB are relatively small—as an indication, imports of aggregates into the UK (ie GB and Northern Ireland—we do not have figures for GB only) amounted to around 2.3 Mt in 2010, which is around 1.4 per cent relative to the UK production.<sup>9</sup> The low proportion of imported aggregates is accounted for by the nature of aggregates which are in general low-value, heavy commodities, and as such transport costs make imported aggregates uncompetitive compared with domestically-quarried aggregates sourced close to the end-market. We received evidence indicating that importing aggregates is viable only for higher-grade aggregates for specialist applications or in certain geographic areas where there is no transport cost disadvantage. Therefore we do not consider barriers in relation to imports.

6.32 It was put to us that hauliers could purchase and distribute aggregates. As a merchant haulage operation concerns the transport of aggregates that have been quarried and does not increase the volume of aggregates available in the market, we do not consider this as an example of entry.<sup>10</sup>

- *History of entry and exit*

6.33 According to the MPA, there were 335 primary aggregates producers in GB in 2008.

6.34 Table 6.4 shows the total number of land-based aggregates sites that were opened and closed between 2008 and 2011. The table also shows the number of sites that were opened and closed by the Majors, which demonstrates that non-Majors accounted for the majority of sites opened and closed during this period.

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<sup>9</sup> Source: *United Kingdom Minerals Yearbook 2011*.

<sup>10</sup> Cemex noted that merchant hauliers could transport aggregates over greater distances by arbitraging prices in different locations and their activity would often increase the total volume of aggregates in a given area.

TABLE 6.4 **Aggregates sites opened and closed in the UK, 2008 to 2011**

	2008	2009	2010	2011	Total
Total sites opened	39	33	38	31	141
Sites opened by the Majors	8	2	6	4	20
Total sites closed	55	64	55	57	231
Total sites closed by the Majors	22	36	35	24	118

Source: CC analysis.\*

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\*CC analysis based, in the case of the Majors, on plant lists provided to the CC by the Majors, and in the case of the independents, on reports by BDS. We note that submissions to BDS are voluntary, therefore the data may not capture all sites opened and closed by independents. We also note the following: (a) sites that are inactive/mothballed in one year and active the next year will show as a site opened in the second year; (b) when quarrying is started on a site that is not part of the original excavation, it may be captured in the data as a new site; and (c) this may include sites set up for specific projects or with a purpose of mainly supplying internally to a company's own downstream operations. Thus, these numbers may overestimate 'genuine' entry and exit events.

6.35 Of the 141 aggregates sites opened between 2008 and 2011, 42 per cent were crushed rock sites, 55 per cent were sand and gravel sites and 3 per cent were combined crushed rock and sand and gravel sites.

6.36 The MPA noted that annual surveys of its members between 2000 and 2008 found that in England, Scotland and Wales there were 314 planning applications to develop or extend sites for the extraction of crushed rock or sand and gravel. 17 per cent of these planning applications were for new sites and 83 per cent were for extensions of existing sites. 75 per cent of the planning applications related to sand and gravel sites and 25 per cent to crushed rock sites. The MPA commented that it was unsurprising that most planning applications were for the extension of existing sites given that most quarry operations were long term in nature, operators generally aimed to maximize the recovery of aggregates from a site, and planning authorities typically released areas of a site for extraction in incremental stages.

- *Possible barriers to entry and expansion*

6.37 In relation to land-based primary aggregates, we consider the following possible barriers:

- (a) availability of greenfield sites;
- (b) planning permission process;

- (c) capital cost;
- (d) economies of scale; and
- (e) barriers to expansion.

6.38 Our assessment has looked at factors likely to apply generally in the UK. Some of the Majors indicated that barriers to entry in particular regions may depend on the geographic distribution of aggregates, transport links, and differences in the ease of obtaining planning permission (see Appendix 6.2).

6.39 We acknowledge that it is possible that the size and impact of barriers to entry and expansion could vary between regions. We have not investigated any such regional variation because, for the reasons set out in paragraph 6.125, we have not investigated individual local aggregates markets in detail.

- *Availability of greenfield sites*

6.40 The availability of primary aggregates is determined by geology as particular types of primary aggregate can be extracted only where they occur naturally. As shown in Appendix 6.2, in England hard rock is predominantly found to the north of a line that runs from the South-West in Devon and Somerset to the north of Norfolk and south of Lincolnshire, whereas sand and gravel is more widely distributed.

6.41 The Majors told us that while there may be limits on the availability of aggregates of a particular type in any area, there was considerable substitutability between rock and sand and gravel in end-uses, and that quarries tended to produce multiple grades (see paragraph 5.6). The only exceptions were for specialist aggregates, although these could generally travel economically for longer distances.

6.42 We conclude that the availability of aggregate resources is not a barrier to entry. Although it is generally not economic to transport aggregates over long distances, the evidence suggests that there is substitutability between crushed rock and sand and gravel in a considerable proportion of general construction end-uses (see paragraphs 5.8 to 5.11) so that access to crushed rock or sand and gravel specifically is usually not important for such applications. Availability can be a barrier to entry in relation to aggregates for higher-specification RMX<sup>11</sup> and asphalt production, and specialist aggregates which occur less widely (see paragraph 6.6).

- *Planning permission process*

6.43 The planning permission process is set out in paragraphs 2.14 to 2.30.

6.44 The planning permission process and the timescale required to obtain planning permission for primary aggregates sites were mentioned by all the Majors as potential barriers to developing new sites for aggregate production. They told us that the total length of time to bring a new site into production (given the stages of getting the site incorporated into the minerals development plan, undertaking environmental impact assessments, preparing the planning application, consulting, and applying for permits and licences) would be likely to take between two and a half and ten years (see Appendix 6.2). The MPA similarly said that a new quarry or extension could take between 5 and 15 years to become operational. It told us that most planning applications for new primary aggregates sites were successful, including applications by small and medium-sized enterprises.

6.45 We were told that some LMPAs had interpreted the recommendations on the land-bank of permitted reserves (see paragraph 2.21) too rigidly, with the effect that there was only a narrow window for new reserves being permitted and that planning appli-

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<sup>11</sup> Tarmac told us that this statement was not relevant for RMX as all the inputs for RMX were widely available.

cations might be refused if the landbank in an area extended beyond the minimum durations specified in the Government's statement. However, DCLG told us that the National Planning Policy Framework (NPPF) contained strong policies on how local planning authorities should approach decision-taking in a positive way to foster the delivery of sustainable development and that to complement these policies DCLG was pursuing a programme of reforms to simplify and speed up the planning system.<sup>12</sup> Aggregate Industries and Cemex commented that these reforms could speed up the process and reduce barriers to entry.

6.46 We conclude, notwithstanding that historically most planning applications were successful, that the length of the planning process limits the competition faced over the medium term by existing aggregate producers from entry by operators developing new sites. The length of the planning process for new sites also creates an incumbency advantage for existing aggregate producers as the planning process for site extensions is generally much simpler (see paragraph 6.55).

6.47 We note that landbanks have an important role in securing future supplies of aggregates. We have assessed whether the way planning policy relating to landbanks is implemented might be distorting competition in paragraphs 11.6 to 11.14, where we have found that it does not appear to do so. We also note the developments in the NPPF mentioned in paragraph 6.45. Therefore, in relation to barriers to entry, whilst in our view the planning regime as a whole presents a barrier to entry, the role of landbanks within the regime does not appear materially to add to this in a way that is out of proportion to the policy outcome intended.

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<sup>12</sup> DCLG also told us that as part of its wider planning reforms, it was undertaking a number of changes to the planning application process. In July 2012 DCLG consulted on a package of proposals to streamline the process. Having considered the public response, it was taking forward all the proposals as consulted on and in January 2013 launched a further consultation on additional measures to streamline planning applications. DCLG commented that these proposals complemented measures in the Growth and Infrastructure Bill, which set out a series of reforms to tackle unnecessary red tape and bureaucracy that could delay and discourage business investment, new infrastructure and job creation. The Bill included a measure that would allow applicants to opt for certain planning applications to be decided by the Planning Inspectorate if the local authority had a clear track record of consistently making excessively slow or ill-judged decisions. The purpose of these reforms was not to centralize planning, rather to ensure that all local authorities met an acceptable minimum standard that one would reasonably expect, thereby removing uncertainty for both applicants and local residents.

- *Capital cost*

6.48 Four of the Majors told us that the capital cost of developing a primary aggregates site was a potential barrier to entry, though three of the Majors noted that the up-front costs could be minimized by leasing land and equipment.<sup>13</sup> The costs for establishing a greenfield site include: the acquisition of land and mineral rights; land preparation, access and restoration (at the end of the site's life); and equipment costs. Estimates for the cost of equipment varied substantially depending on the size of the site and whether it was a crushed rock or sand and gravel site (see Appendix 6.2), but ranged from £0.25 million for a small sand and gravel site to potentially over £40 million for a large crushed rock site.

6.49 The capital cost of developing production needs to be assessed in the light of the anticipated revenues and margins of that facility and the ability to access finance. We did not receive a persuasive body of evidence from parties indicating that they perceived capital costs as a significant barrier to entry. We conclude that while there can be a considerable cost in developing an aggregates site, the cost need not be prohibitive, particularly for small-scale sites, if the land and mineral rights are leased and the equipment is leased or rented.

- *Economies of scale*

6.50 The Majors told us that some economies of scale existed in relation to primary aggregates, as larger sites could be operated more efficiently than smaller sites in terms of unit costs because for larger sites, fixed costs were spread over a greater volume of sales. However, Aggregate Industries told us that the fact that quarries of all sizes competed in the same local areas indicated that economies of scale were not an important factor. Other Majors argued that economies of scale would not be achieved if there was insufficient local demand for the plant to be operated at capacity, and so

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<sup>13</sup> Tarmac also noted that the supply of labour and machinery could be subcontracted.

the optimum size of plant depended on the nature of the market for aggregates in that area.

6.51 The Majors also noted that there could be economies of scale arising from overall size across multiple sites, through sharing central support costs, improving the organization of logistics and giving access to expertise, although Tarmac said that these factors were not important due to the local nature of markets.

6.52 We considered the evidence on economies of scale as part of our analysis of plant-level margins (see paragraphs 6.80 to 6.88). We found significant variations in plant-level margins and no discernible relationship between production volumes and plant-level margins, and concluded that there was unlikely to be any significant plant-level economies of scale but that some large aggregates plants benefited from rail links which could reduce transport costs compared with road haulage.

- *Barriers to expansion*

6.53 The Majors told us that there were very limited barriers to increasing production at an existing operational primary aggregates site within its existing plant capacity. Possible factors might include any planning permission for changing the hours of operation, and the availability of transport capacity. We were also told that there currently existed substantial excess capacity within the aggregates industry.

6.54 The Majors also told us that there were limited barriers to increasing the capacity of an existing plant. Gaining planning consent could constitute a barrier, but we were told that the process was much less onerous and the timescale much shorter for a capacity extension at an existing site than for a new greenfield development. The MPA told us that most planning applications for the expansion of aggregates sites

were successful, and that the large companies and SMEs had similar success rates in obtaining planning permission.

- 6.55 We conclude that expanding an existing site, either by increasing its output or by extending the site, is likely to be easier, faster and cheaper than developing a new site because the planning process is likely to be simpler, and much of the required equipment will already be in place. While barriers to expansion are lower, this implies that existing producers have an incumbency advantage over new entrants.

#### *Marine aggregates*

- 6.56 Marine aggregated accounted for 4.8 per cent of GB aggregates supply in 2010.<sup>14</sup> According to the British Marine Aggregates Producers Association (BMAPA) (based on information on The Crown Estate website<sup>15</sup>), there are 14 companies active in marine dredging which together operate 27 vessels in 70 production licence areas (Hanson, Tarmac and Cemex are the most active operators, with licences to dredge in 20, 18 and 10 areas respectively) and there are 62 licence applications currently outstanding, of which 21 have been submitted by Cemex, 14 by Hanson and 13 by Tarmac.
- 6.57 The principal modes of entry or expansion are developing or expanding a marine aggregates dredging operation. Marine sand and gravel extraction can only take place where suitable resources exist. Seabed sand and gravels are widespread around GB, but many deposits are in deep water or are too thin to be commercially dredged or are dominated by unsuitable grain sizes (eg fine sand) and therefore not suitable for construction aggregate use.<sup>16</sup> The industry believes that the commercially viable resources of marine sand and gravel are sufficient to last for at least 50 years

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<sup>14</sup> [www.bmapa.org/about/key\\_facts.php](http://www.bmapa.org/about/key_facts.php).

<sup>15</sup> [www.thecrownestate.co.uk/marine/aggregates/our-portfolio/](http://www.thecrownestate.co.uk/marine/aggregates/our-portfolio/).

<sup>16</sup> The practical limit in dredging is 50 metres.

at the current rates of extraction.<sup>17</sup> The volume and location of the marine aggregates that can be extracted by dredging are dependent on the licensing regime. The area of the UK seabed that was licensed for dredging in 2011 was 1,274 km<sup>2</sup>, which represents 0.15 per cent of the total UK seabed; the area actually dredged was 114 km<sup>2</sup>, which was 8.9 per cent of the area licensed.<sup>18</sup>

- 6.58 As set out in Appendix 2.1, the commercial rights to marine sand and gravel resources in the waters around the UK are held by The Crown Estate, which issues licences for prospecting and production. A licence for marine mineral extraction is also required from the Marine Management Organisation.<sup>19</sup> Operators told us that historically the process to obtain a production licence could take up to ten years, but the process had been simplified and now should not take more than three years.
- 6.59 We were told that there are over 60 wharves in 35 ports around England and Wales where marine aggregates are currently unloaded, and so access to wharf facilities did not present a barrier to entry.
- 6.60 The cost of entry into marine aggregates production varies substantially depending on the scale of production. We received estimates of set-up costs of between £[redacted] million and £[redacted] million to establish the operation and between £[redacted] million and £[redacted] million for the cost of a dredger if a new one were to be purchased rather than leased. Entry at the upper end of these production scales would represent a significant proportion of the UK marine aggregates industry, which landed a total of 11.5 million tonnes of aggregates in the UK in 2011.

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<sup>17</sup> British Geological Survey: *The strategic importance of the marine aggregates industry in the UK*.

<sup>18</sup> *The area involved—14<sup>th</sup> annual report*, published by the BMAPA and the Crown Estate, August 2012.

<sup>19</sup> [www.bmapa.org/regulation\\_and\\_management/licensing\\_and\\_regulation.php](http://www.bmapa.org/regulation_and_management/licensing_and_regulation.php).

6.61 Our conclusion is that licensing and capital outlay considerations in relation to the production of marine aggregates create barriers to entry in the aggregates market via this route similar in scale to those created by the planning process and capital requirements to enter via the production of land-based primary aggregates.

*Secondary and recycled aggregates*

6.62 The Majors told us that there were low barriers to entry into secondary aggregates production, when a steady supply of secondary material was available. We were told that little capital investment was required; crushing, grading and sorting equipment could be leased, and we were told that planning represented a much lower hurdle than in the case of primary aggregates.

6.63 We were also told that there were low barriers to entry into recycled aggregates production, although the availability of materials (primarily from demolition and construction waste) to recycle could limit the production of recycled aggregates. The MPA said that up to 5 Mt of hard material could potentially still be extracted from the waste stream<sup>20</sup> As discussed in paragraphs 5.12 to 5.22, recycled materials can be substituted in full for all primary low-grade aggregates, although they may not be suitable for higher-specification products. For example, BAA noted that recycled aggregates were not suitable for use in the production of higher-strength concrete when quality assurance was an important consideration as the concrete had to be made with a consistent grade of raw material from a known origin.

6.64 Capital costs are significantly lower than for primary aggregates as when the operation is co-located with a demolition site there is no additional land cost, and the planning process is also simpler(see Appendix 6.2).

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<sup>20</sup> [MPA hearing summary](#), paragraph 12.

- 6.65 The MPA told us that the share of secondary and recycled aggregates in the GB aggregates market had increased from 10 per cent in 1990 to 28 per cent in 2011, and we note that the NPPF provides that LMPAs should take account of secondary and recycled materials before considering the extraction of primary materials.<sup>21</sup>
- 6.66 Therefore, we conclude that there are lower barriers to entry for recycled aggregates than for primary aggregates. The incentives to recycle aggregates will respond to the pricing of aggregates, although the limit on the availability of material to recycle will constrain entry via this route and, for the reasons set out in paragraphs 5.12 to 5.22, recycled aggregates are not fully substitutable for primary aggregates across the full range of end-uses.
- 6.67 Secondary aggregates are, by definition, the by-products of other industrial processes. Given the landfill tax and the revenue able to be realized through the sale of secondary aggregates, there are likely to be strong incentives on producers of material that can be sold as secondary aggregates to sell it as such, rather than simply to dispose of it. However, the amount of secondary aggregates produced is unlikely to vary in response to variations in the competitive conditions for primary aggregates: rather, the amount produced is likely to depend mainly on the production of the primary products from which they are derived (or if technological advances make secondary aggregates production or processing more commercially viable). Consequently we conclude that expansion in the supply of secondary aggregates is unlikely to form a competitive constraint.

*Conclusions on barriers to entry and expansion*

- 6.68 For the reasons detailed in paragraphs 6.40 to 6.55, we conclude in relation to primary aggregates that barriers to entry and expansion can arise due to the time

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<sup>21</sup> NPPF, paragraph 143.

required to identify and acquire a suitable site and to obtain planning permission. This limits the competition faced by existing aggregates producers over the medium term from operators entering the market by developing new sites. In addition, it is likely to be easier, faster and cheaper to expand an existing site, either by increasing its output or by extending the site, than to develop a new site because the planning process is simpler and much of the required equipment will already be in place. This gives existing producers an incumbency advantage over new entrants.

6.69 While there can be a considerable cost in developing an aggregates site, the cost need not be prohibitive, particularly for small-scale sites, if the land and mineral rights are leased.

6.70 For marine aggregates, licensing and capital outlay considerations create barriers to entry similar in scale to those created by the planning process and capital requirements to enter the land-based primary aggregates market.

6.71 Barriers to entry into the production of secondary and recycled aggregates are considerably lower than for primary aggregates, provided there is a suitable supply of secondary material or material for recycled aggregates in a given area.

*Other aspects of market structure (eg structural links)*

6.72 We note that there are considerable structural links between the Majors (whether considering the pre-2013 Majors or the 2013 Majors). Appendix 3.1 lists the joint ventures with which each pre-2013 Major was involved. With the exception of MQP, which is now fully owned by Hanson (see paragraph 1.19), these JVs continue at present. The majority of these JVs related to aggregates operations. The pre-2013 Majors were also members of a common trade association (the MPA), Lafarge Tarmac is now a member of the MPA and [REDACTED].

6.73 Our concern is not that these JVs or trade associations in themselves are aimed at facilitating market transparency or anti-competitive activity, and we have seen no evidence that this is the case. Our concern is that JVs necessitate meetings between the JV partners, and trade associations necessitate industry gatherings more generally. In the margins of such meetings, there are repeated opportunities for informal senior level business contacts.

## **Market outcomes**

### *Profitability*

6.74 We have conducted an assessment of the profitability of the Majors' aggregate operations across GB in accordance with our profitability framework, as set out in Appendix 4.1. We have tailored this framework specifically for the purpose of assessing aggregates profitability and we set out these aggregates-specific methodologies in Appendix 6.3. Appendix 6.3 also sets out our detailed results and our interpretation of aggregates profitability in GB.

6.75 We assess the Majors' profitability by comparing their return on capital employed (ROCE)<sup>22</sup> with their cost of capital. We initially calculated their return on capital employed by using accounting information prepared on a (modified<sup>23</sup>) HCA basis, the basis on which the Majors routinely prepare their financial information. We then sought to estimate the Majors' ROCE on an economic basis where the value placed on the capital employed within aggregates reflected our best estimate of its current value to the business, ie on a CCA basis. The principal area of focus for aggregates was the value to be placed on mineral-bearing land.

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<sup>22</sup> ROCE is a measure of profitability. For this purpose it is measured as the operational profit for a period divided by the value of the operational net assets relevant to the same period expressed as a percentage.

<sup>23</sup> Some Majors have revalued some of their fixed assets including mineral-bearing land.

- 6.76 ROCEs based on the Majors' own valuation of their assets (modified) HCA basis suggest that returns have generally been low to modest across these businesses over the last five years. Each Major has experienced a substantial decline in its returns following the slump in demand from 2008 onwards. Although returns recovered in 2010 and even more so in 2011, they have not returned to 2007 levels.
- 6.77 We have sought to revalue mineral-bearing land on the basis of inflated purchase cost so that the real value of the initial investment is maintained in purchasing power terms. This approach to asset valuation avoids the inherent circularity of valuing mineral resources on the basis of their revenue-generating potential, the basis on which their market value is normally assessed.<sup>24</sup>
- 6.78 Once we reassess the Majors' mineral-bearing land values to reflect inflated cost, this leads to an increase in ROCE for those Majors which have revalued these assets to reflect market value more recently and a decrease in ROCE for those Majors which have not.
- 6.79 The exercise of seeking to revalue the Majors' mineral-bearing land has highlighted the difficulty of fully capturing in our analysis the profitability arising from owning the mineral-bearing land when its commercial potential is first recognized. Measured profitability will therefore reflect the degree to which the identified original purchase cost for the land reflected the revenue-generating potential from its commercial extraction. This means that, even if the Majors are able to identify original purchase cost, and only three of the five have been able to do so for purchases occurring before 2000, profitability assessed on the basis of inflated cost will not necessarily reflect all the returns from the land and will therefore be artificially low.

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<sup>24</sup> This is because market value will be closely related to the discounted present value of the expected revenue from operations less running costs and net closure costs. As such an approach would embed in capital values any excess economic profits expected to arise from its further commercial extraction, it is wholly unsuitable for the purpose of assessing whether profitability is in any sense excessive.

## *Margins*

- 6.80 Appendix 6.4 presents the methodology for our analysis of cost structures and profit margins. Appendix 6.5 presents the results of our analysis of the cost structures and the profit margins of the aggregates operations of the Majors, and Appendix 6.6 presents the results of our analysis of the cost structures and the profit margins of the aggregates operations of the medium-tier independents. .
- 6.81 Our analysis shows that, for each Major, aggregates margins (at divisional level) have been gradually falling over the period 2007 to 2011—with price increases being outpaced by growth in variable costs. Our analysis of the ‘mid-tier’ aggregates producers shows significant variation in margin levels and volatility over the period 2007 to 2011.
- 6.82 Our analysis of the Majors’ margins for their aggregates operations (where data was available) indicated that, with the exception of one Major, margins on internal sales (ie aggregates sold to their own downstream businesses) were significantly higher than on external sales. We examined further the reasons for this.
- 6.83 [X] told us<sup>25</sup> that our analysis showing that its net margins were higher on external sales than internal sales was not accurate because the CC removed intradivisional sales from its analysis but not the associated delivery costs. [X] argued that, once this was corrected, the analysis showed that margins on internal sales were higher than margins on external sales. According to [X], this was likely to reflect the differences in product mix, the location of internal and external customers and the total volumes purchased.

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<sup>25</sup> [X]

- 6.84 Tarmac told us<sup>26</sup> that it did not set its internal prices artificially high to increase external prices for RMX. It noted that such a strategy would not be effective given intense competition in the supply of RMX. Tarmac said that it did not set prices of RMX on a cost-plus basis and therefore the internal transfer price that Tarmac set for aggregates had no impact on the external selling price of RMX. It said that its internal prices for aggregates were set for internal accounting purposes to allow for a return to be made on Tarmac's high fixed-cost upstream investments.
- 6.85 Hanson and Tarmac said<sup>27</sup> that they had policies which resulted in their internal transfer prices for aggregates being higher than their external prices. Both said that their policies would not affect competition for RMX (but might affect the apparent profitability of their RMX businesses).<sup>28</sup>
- 6.86 Lafarge, Aggregate Industries and Cemex said<sup>29</sup> that they tried to set their internal transfer prices to be as close as possible to the external price, and that any indication in our analysis that this was not the case was likely to be due to product mix/geography/haulage differences.
- 6.87 In light of the Majors' explanations of their aggregates transfer pricing policies, we did not analyse further the apparent differences that we found between their margins on internal sales and their margins on external sales in the context of our aggregates competitive assessment. However, we consider the impact of aggregates transfer prices further in relation to RMX profitability and margins—see Appendix 6.5. We also consider the role of internal transfer prices in our assessment of the effects of vertical integration in Section 10.

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<sup>26</sup> [Tarmac response to updated issues statement](#).

<sup>27</sup> [Hanson](#) and [Tarmac](#) second hearings.

<sup>28</sup> Hanson told us that its internal prices and accounts were artificial since no real sale actually ever took place internally in relation to such pricing.

<sup>29</sup> [Lafarge, Aggregate Industries](#) and [Cemex](#) second hearings.

6.88 Our analysis of cost structures for the Majors' aggregates divisions showed that there were considerable differences in their cost structures. Even when we partially controlled for product type, eg crushed rock, we found significant variations in their cost structures.

*Price-concentration analysis and entry and exit analysis*

6.89 A PCA uses econometric techniques to examine the relationship (if any) between the price for a good in an area and the strength of competition to supply that good in that area. For the purposes of this investigation, we undertook a PCA to understand, on average across GB, the relationships between the prices of aggregates and the extent of competition in local construction aggregates markets, using the catchment areas described in paragraph 6.13.

6.90 The aim of our PCA was to assess whether, and how, the relationship between prices and the extent of competition varied by type of competitor,<sup>30</sup> taking into account the size of plants and their proximity to the customer, and the identity of competitors. In this analysis we looked at the areas around job sites rather than at the areas around the locations where aggregates are produced (eg quarries), on the grounds that prices at the same quarry and for the same product varied across customers, and because this more accurately reflected the choices available to customers when deciding from which company to purchase their aggregates. Details of our methodology, including the model we developed, the data we used and how we measured competition in local markets, are set out in Appendix 6.7.

6.91 Our PCA produced mixed results, but generally the effects of increased competition on price, where they existed, appeared relatively small. In broad terms:

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<sup>30</sup> We made a distinction between the five Majors and the non-Majors.

- (a) The presence nearby of non-Major firms appears to have either no effect on the Majors'<sup>31</sup> pricing, or a positive price effect (a positive price effect means that the presence of independents was associated with higher prices in a local market).<sup>32</sup> This suggested that the presence of non-Major competitors did not have a clearly discernible effect on the Majors' prices.
- (b) The presence nearby of other Majors had positive effects on Majors' pricing in some cases and negative effects in other cases (a negative effect means that the presence of other Majors was associated with lower prices in a local market). However, these price effects, where they existed, tended to be relatively small (about 1 to 2 per cent of the purchase price).
- (c) There was no consistent statistically significant effect on prices of a greater number of aggregates sites (ie more aggregates sites nearby were sometimes associated with higher prices and sometimes with lower prices, although the effect was often not statistically significant).
- (d) There was little evidence from our PCA that a greater number of recycled aggregates plants in an area imposed stronger constraints on primary aggregates prices.<sup>33</sup>
- (e) Our PCA did, however, show that quantity discounts appeared to be important in explaining variations in prices that customers paid. We found that larger customers paid lower prices.

6.92 An E&EA uses econometric techniques to examine how prices may change with the entry or exit of a competitor in a local area. For our investigation, we explored the impact on prices of the entry and exit of competing aggregates plants near aggre-

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<sup>31</sup> In the context of our PCA and our E&EA, all references to the Majors are references to the pre-2013 Majors.

<sup>32</sup> These were results of our main analysis; sensitivity analysis showed no consistent statistically significant effect (ie in some cases the effect on prices was positive and in some cases negative).

<sup>33</sup> Although there were some statistically significant price effects from additional recycled aggregates plants near job sites, these price effects were small and often positive (ie more recycled aggregates plants were associated with higher prices on average). We noted, however, that the PCA produced average results across local markets, and that the available data on recycled aggregates plants might not be comprehensive.

gates customers' job sites. Details of our methodology, including the model we developed and the data we used, are set out in Appendix 6.7.

- 6.93 In a competitive market with few suppliers, with all else equal, entry would generally be expected to result in prices falling, whereas exit could be expected to result in prices rising. However, the impact on prices could be expected to differ depending on the strength of the constraint posed by the plant entering or exiting the market, and therefore with this analysis we attempted to understand whether the impact of entry and exit depended on the identity of the owner of the entering or exiting plant and the plant's proximity to the customer. We found little evidence that entry or exit of plants had an effect on prices.
- 6.94 With respect to both our PCA and our E&EA, we noted that the average effects that we observed might hide local or regional variability in competitive constraints, to the extent that they existed.
- 6.95 The Majors told us that there was lots of local variation in aggregates markets, so it was difficult to generalize about the role of Majors, independents, recycled and secondary aggregates. According to the Majors (as set out in paragraph 6.118 to 6.122), aggregates markets are very competitive, with lots of choice of supplier and considerable excess capacity. The Majors told us that this explained the lack of impact on prices in our PCA and our E&EA of the number of competitors and the presence or absence of recycled aggregates in a local market. The Majors regarded our PCA and E&EA results as evidence supportive of the position that aggregates markets are competitive.

6.96 Some parties raised concerns about our methodology and the data on aggregate site entry and exit for the E&EA.<sup>34</sup> Where appropriate, we have carried out extensive sensitivity analysis (see Appendix 6.7), and found that the results of these robustness checks did not change our conclusions. With respect to E&EA, we noted that this analysis could be more prone to inaccuracies in the data on aggregate plant entry and exit, and therefore placed less weight on the findings from the E&EA.

### ***Conduct***

6.97 To supplement the evidence we obtained on the conduct of aggregates producers and aggregates customer from parties' submissions and hearings with parties, we undertook two pieces of analysis: (a) our aggregates case studies and (b) our analysis of price announcement letters for aggregates.

#### *Aggregates case studies*

6.98 These comprised both telephone interviews and a document review for two areas of GB: South Wales and the west of East Anglia (see Appendix 6.8, which sets out further details on our aggregates case studies). The two case study areas were both characterized by relatively high levels of concentration in terms of shares of supply by the Major aggregate producers.

#### *Telephone interviews*

6.99 From our telephone interviews of aggregates customers and non-Major aggregates suppliers in the two case study areas we investigated, we found that:

(a) Consolidation of aggregates producers might have diminished local competition.

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<sup>34</sup> With respect to the PCA methodology, Tarmac and Lafarge raised concerns regarding our urban/non-urban classification of sites. Tarmac, Lafarge and Hanson were concerned that data on entry and exit might not accurately measure entry and exit events for the purposes of an E&EA.

- (b) Some aggregates producers appeared to operate in more specialized aggregates products and so might not constrain directly producers of construction aggregates.
- (c) Most customers of aggregates producers appeared to be happy with the sufficiency of competition for primary aggregates and the ability of independent producers to exercise a competitive constraint on the Majors.
- (d) Recycled aggregates provided a degree of competitive constraint on primary aggregates.
- (e) Independent RMX producers appeared to be able to compete against the Majors albeit that they might offer slightly different services (eg smaller concrete pours) at (potentially) higher prices.
- (f) The fact that independent RMX producers might not be vertically integrated into aggregates production did not appear to prevent them competing against the Majors.
- (g) Save for evidence from one interviewee, taken as a whole, the evidence obtained from the case study telephone interviews did not suggest that there were anti-competitive outcomes as a result of coordination in either of the case study areas.
- (h) Save for evidence from two interviewees, the evidence obtained from the case study telephone interviews did not suggest that independent RMX producers were being vertically foreclosed (see paragraphs 4.30 to 4.32) in either of the case study areas.
- (i) Some market participants considered that the aggregates levy disadvantaged smaller aggregates producers whilst others did not consider that the aggregates levy distorted competition.
- (j) There were some concerns about the planning regime (eg that it took a long time to obtain planning permission for a new quarry/site extension).

*Case study document review*

- 6.100 We reviewed a large number of internal documents related to the South Wales and the west of East Anglia case study areas provided to us by the Majors. Our review:
- (a) indicated that there were multiple contacts between the Majors across markets. These included regional meetings across the industry and private meetings organized between the Majors. The existence of shared sites and quarries and various cross-supply agreements established a degree of interdependence between the Majors;
  - (b) indicated that there was a degree of transparency with respect to prices across the market. Each of the Majors seemed to have information on the prices applied by its competitors—either from the customers who reported on competitors’ prices, or from the competitor directly where there was a cross-supply agreement between the Majors;
  - (c) revealed the level of insight that each Major had with respect to the market and its competitors. It appeared from the documents that the Majors were operating in the market aware of the profile and position of each of their competitors; and
  - (d) contained evidence of various discussions and internal business and strategy reports that demonstrated that the Majors were competing with each other as they focused on gaining market share or pursuing competitors’ customer to switch to their services.
- 6.101 The evidence we obtained from our case study telephone interviews and from our case study document review in the South Wales and the west of East Anglia areas indicated a lack of significant and widespread competition problems in relation to the supply and acquisition of aggregates in these areas. In light of this evidence, and in order to make best use of our resources, we decided not to undertake any further work in additional case study areas.

### *Price announcement letters for aggregates*

6.102 We analysed the price increase announcement letters sent by the pre-2013 Majors (that is, Aggregate Industries, Cemex, Hanson, Lafarge and Tarmac—which we refer to for simplicity in this discussion as ‘the Majors’) to their aggregates customers.

These are letters sent to inform the customers of the Majors’ intentions to increase the price of aggregates products in the near future. Announcements usually take place at least once a year (around January) but can also happen more frequently in a year (eg in April and/or in June). The letters are usually sent around one to three months before the price increase is intended to become effective.

6.103 The aim of our analysis of these letters was to understand whether there were patterns in the price increase announcement letters which may indicate that these letters are used as a mechanism for reaching common understanding on the level of prices in the industry or on the direction and amount by which prices should increase. In this context, this could be the case if we found that there is a degree of parallelism in the announcement dates and the magnitude of the notified price changes. We also conducted an analysis of how and whether the announced price increases are translated into higher average realized price increases, to understand how effective any such mechanism for reaching a common understanding might be in practice.

6.104 Details of the Majors’ explanations for sending out price announcement letters for aggregates are in Appendix 6.9. The Majors made the following general points:

(a) The announced price increases took into account forecasts of likely cost inflation in the coming year and financial targets, and, on occasion, under-recovery of cost increases in the current year.

(b) The announced price increases were aspirational only. They served as a starting point for negotiations with customers and did not reflect actual price increases agreed with customers.

- 6.105 We found that, over the period of time we analysed, there was parallelism between the Majors in relation to the dates of their price increase announcements, in particular for the January price increases, but also for some of the mid-year price increases. Although this can be explained at a general level by the Majors' annual price review processes (in relation to the January announcements) or changes in common regulatory costs (such as changes to the aggregates levy in April), the parallelism in the dates of the announcements is notable. For example, the timing of the price increase announcement for 1 June 2010 was relatively unusual and was not related to changes in the aggregates levy.
- 6.106 We also observed that the level of the announced price increases were on many occasions quite similar between the Majors for each product group. The price announcements of Majors which were not first to announce in most cases accommodated the announcements of Majors which had announced earlier but sometimes also undercut them, with the exception of [redacted]. Although we lacked some data with respect to exact announcement dates and we could not therefore generalize the trends we observed, we found that on many occasions Aggregate Industries and Tarmac were the first to announce price increases.
- 6.107 We compared announced price increases with changes in realized prices. We found that in almost all the cases that we analysed, the Majors were able to increase their average prices following one of their own price increase announcements, although this increase was [redacted] of the announced price change. There were cases though where the Majors achieved an increase that was larger [redacted].
- 6.108 Further detail and the limitations to our analysis are presented in Appendix 6.9.

## ***Effect of market developments***

6.109 The key recent developments in the relevant markets are described in paragraphs 1.13 to 1.19, namely in 2013: the creation of Lafarge Tarmac, the entry of HCM and the acquisition by Hanson of Tarmac's 50 per cent stake in MQP (previously a 50:50 JV between Hanson and Tarmac. We set out in paragraphs 4.35 to 4.37 how we have taken them into account.

6.110 We set out the views of the pre-2013 Majors on the entry of HCM and the creation of Lafarge Tarmac as part of our competitive assessment of cement (see Appendix 7.15), since their comments largely focused on the impact of these changes on cement.

6.111 In relation to GB aggregates markets, these market developments resulted in:

- (a) the combination under shared ownership of the majority of the aggregates operations of Lafarge and Tarmac. At its inception on 7 January 2013, Lafarge Tarmac owned 134 primary aggregates quarries and various other operations including 38 recycling and secondary aggregates sites;
- (b) the entry of HCM into the GB aggregates markets, with (at its inception) six primary aggregates sites and one aggregates depot; and
- (c) the exit of Tarmac from the MQP JV. MQP operates two active quarries as well as six asphalt plants.

6.112 Table 6.2 shows the effect of these changes on shares of supply of aggregates in GB. As set out in paragraph 6.10, Lafarge Tarmac is now, by some margin, the largest producer of aggregates with a GB share of primary aggregates of around [X] per cent. Compared with the other Majors, HCM is a relatively small player in GB aggregates markets taken as a whole.

6.113 Following the formation of Lafarge Tarmac and HCM, and Hanson acquiring ownership of MQP in full, the figures for the concentration of local aggregates markets in paragraphs 6.18 and 6.19 above need to be slightly adjusted:

- (a) 89 (rather than 90) per cent of job sites where aggregates were purchased and delivered in 2011 had a choice of more than five suppliers within the 80 per cent catchment distances around those sites;
- (b) in the catchment areas around 11.4 (rather than 11) per cent of job sites, the largest company had a market share (by 2011 sales volume) of more than 50 per cent; and
- (c) in the catchment areas around 28.5 (rather than 22) per cent of job sites, the four largest companies collectively had a market share of more than 90 per cent.

6.114 These figures indicate a relatively high degree of concentration in a slightly larger number of local aggregates markets as a result of recent market developments.

6.115 At a local level, the CC in its Anglo–Lafarge JV inquiry report identified those local overlaps between the aggregates operations of Lafarge and Tarmac which would have created competition problems, and required remedies that would be effective in addressing those concerns.<sup>35</sup> While there will have been some increases in local concentration as a result of the creation of Lafarge Tarmac (eg where the overlaps in the pre-JV operations of Lafarge and Tarmac were not found to cause competition problems or where the CC's remedy did not require divestment to remove the entire overlap), the CC in its Anglo–Lafarge JV inquiry report did not expect any such increases in local concentration to give rise to competitive harm, once the divestitures have been implemented.

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<sup>35</sup> [Anglo–Lafarge JV final report](#) .

6.116 Overall, for the reasons set out in paragraphs 6.112 to 6.115, we considered that recent market developments did not have a material impact on our competitive assessment of GB aggregates markets.

### ***Our assessment***

6.117 As set out in paragraph 4.21, we assessed whether features of GB aggregates markets gave rise to one or more AECs as a result of unilateral market power or as a result of coordination.

#### *Unilateral market power*

##### *Parties' views*

6.118 Aggregate Industries told us that its own analysis showed that the few local areas with high concentration of aggregates suppliers were areas of low demand or low availability of primary aggregate resources for geological reasons. According to Aggregate Industries, there was a strong positive correlation between the number of suppliers in an area and demand in that area.

6.119 Lafarge said that having four competing suppliers was sufficient for a competitive outcome (and that three might also be sufficient) given that suppliers of aggregates were likely to have spare capacity.

6.120 Cemex said that there was intense competition in local aggregates markets. It said that it was unable to comment further as the CC had not identified those local markets in which there were fewer competitors and/or higher shares of supply.

6.121 Hanson said that there were high levels of competition and customer choice for aggregates, as evidenced by the large number of producers, the high numbers of

competitors in local aggregates markets as shown in the CC's analysis, surplus capacity across aggregates markets in general and low levels of profitability.

6.122 Tarmac did not consider that there was unilateral market power in any aggregates market. It noted that, in its view, barriers to entry were substantially lower for secondary and recycled aggregates, and that any incumbency advantage in aggregates was enjoyed by hundreds of incumbents. Further, it said that capital cost was only sometimes a barrier to entry. It also said that nearly 100 per cent of customers had a choice of six or more suppliers.

#### *Assessment*

6.123 In relation to unilateral market power, our analysis indicates that:

- (a) There are significant barriers to entry into local aggregates markets through the supply of primary aggregates. However, there are fewer barriers to the expansion of existing aggregates operations, and to entry through the supply of recycled and secondary aggregates (see paragraphs 6.29 to 6.71).
- (b) Most customers have a choice of several different aggregates suppliers, and the extent of high concentration in local markets is limited (see paragraphs 6.18 to 6.19).
- (c) According to our PCA and E&EA, when customers have a wider choice of aggregates supplier (including suppliers of recycled aggregates), this does not clearly lead to lower prices. However, we note that our PCA and E&EA produced average results across GB, and might hide local or regional variability in competitive constraints.
- (d) The Majors' ROCEs in their aggregates operations have been low to modest over the last five years (albeit on a GB-wide basis), with the exception of one company which appears to have had significantly higher returns than the others (see paragraphs 6.74 to 6.79).

(e) For each Major, aggregates margins (at divisional level) have been gradually falling over the period 2007 to 2011—with price increases being outpaced by growth in variable costs. Our analysis of the medium-tier independent aggregates producers shows volatility and significant variation in margin levels over the period 2007 to 2011 (see paragraph 6.81).

6.124 The case study interviews suggest that the presence of independent aggregates producers generates downward pricing pressure and that consolidation of aggregates producers has diminished this local competition. However, taken as a whole the case study documents and the case study interviews do not appear to suggest that unilateral market power is a problem in either of the two case study areas (see paragraphs 6.98 to 6.101).

6.125 Overall, we did not find evidence indicating widespread competition problems across multiple local markets arising from the ability to exercise of unilateral market power in the supply of construction aggregates in GB (see paragraphs 6.123 and 6.124). Our detailed analysis of the supply of aggregates in two areas of GB also did not find any evidence of competition problems with respect to these two areas. Given the lack of concerns raised by our analysis, both across multiple local areas and in the two specific areas assessed, and given constraints on the time and resources available for our investigation overall, we did not carry out further analysis of individual local markets for aggregates. We have not identified any features giving rise to an AEC as a result of unilateral conduct in relation to the supply of construction aggregates in GB.

## *Coordination*

### *Parties' views*

- 6.126 Tarmac told us that coordination in aggregates markets was not possible. It noted that shares of supply on a national level were not relevant as aggregates markets were local. Further, in Tarmac's view, barriers to expansion were not particularly high due to widespread excess capacity, and entry costs were not prohibitive, especially if land and mineral rights were leased. Tarmac argued that JVs and membership of trade associations did not increase transparency: production-only JVs did not sell jointly, and no trading or commercial contract information was shared in any JV in which Tarmac was on the board. Tarmac noted that MPA data was aggregated and not granular enough to allow real insight into competitors' behaviour.
- 6.127 Aggregate Industries told us that coordination in GB aggregates markets was not a credible concern. It said that:
- (a) Variation between local markets, low levels of concentration, sales via bilateral negotiations, a large and diverse customer base, ease of switching and excess capacity deterred coordination.
  - (b) National shares of supply showed no symmetry between the top five aggregates producers, so there was no alignment of incentives to coordinate.
  - (c) Aggregate Industries' own analysis showed that the few local areas with high concentration of aggregates suppliers were areas of low demand, or low availability of primary aggregates resources for geological reasons.
  - (d) Whilst there might be barriers to entry in aggregates, barriers to expansion were low and there was currently considerable excess capacity.
  - (e) Whilst aggregates of a given sub-type might be relatively homogeneous, there were other factors affecting the nature of supply such as haulage, terms and conditions of supply and so on that would make coordination very difficult.

(f) The results of the CC's PCA and E&EA for aggregates reflected low levels of demand and a very competitive market, rather than coordination.

6.128 Hanson said that<sup>36</sup> the following factors precluded coordination in aggregates:

- (a) the high degree of competition (both Majors and non-Majors) in local aggregates markets;
- (b) product and geographic differentiation;
- (c) the availability of secondary and recycled material;
- (d) limited transparency in the market as a result of confidential bilateral purchasing negotiations and large numbers of customers and suppliers; and
- (e) companies that made price increase proposals following the first proposal sometimes undercut the price increase of the first proposal.

#### *Assessment*

6.129 Taking into account what the Guidelines say regarding the assessment of whether coordination is giving rise to an AEC (see paragraph 4.28, 8.159, 8.160, 8.181 and 8.208), we note that there are some aspects of the supply of aggregates in GB that may make at least some local markets susceptible to coordination. These include the high market shares held by the Majors in some local markets (see paragraph 6.19), product homogeneity (see paragraph 6.21), barriers to entry into the production of primary aggregates (see paragraphs 6.29 to 6.71), structural links between companies (see paragraph 6.72) and price announcement behaviour (although any patterns in this behaviour are not clear—see paragraphs 6.102 to 6.108).

6.130 However, we found that there were several factors that reduced our concern that coordination might be occurring in local aggregates markets. These factors are:

- (a) geographical differentiation of aggregates products (see paragraph 6.22);

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<sup>36</sup> [Hanson response to updated issues statement](#).

- (b) wide variation in competitive conditions (eg the number and identity of suppliers) from one local area to another (see paragraph 6.19 and Appendix 6.7); and
- (c) the Majors' relatively modest (in general) returns and falling margins on their aggregates operations (see paragraphs 6.76 and 6.81).

6.131 The results from our aggregates case studies work (see paragraph 6.101) also reduced our concern that coordination might be occurring in the two areas which we assessed. Neither the document review for the case study areas nor our interviews with competitors and customers suggested that coordination might be occurring in these local areas.

*Aggregates competitive assessment: conclusions*

6.132 Overall, we did not find evidence indicating widespread competition problems across multiple local markets (whether as a result of unilateral market power or coordination). Our detailed analysis of the supply of aggregates supply in two specific areas of GB also did not find any evidence of competition problems with respect to these two areas. Given the lack of concerns raised by our analysis, both across multiple local markets and in the two specific areas we assessed, and given constraints on the time and resources available for our investigation overall, we did not carry out further analysis of individual local markets for aggregates. We have not identified any features giving rise to an AEC in any market in GB for the supply of construction aggregates.

6.133 As noted in paragraph 6.116, we considered that recent market developments did not have a material impact on our competitive assessment of GB aggregates markets.

## **7. Cement: evidence and analysis**

7.1 As described in paragraph 5.53, we have defined a single relevant product market for bulk grey cement including different types of cement (ie CEM I, CEM II, CEM III etc) and imported and GB-produced cement. We have defined bagged cement as a separate product market. In terms of geographic scope, we have focused primarily on competition at a GB level, including competition from imports.

7.2 In this section, we set out the evidence available to us and the analysis we carried out as part of our assessment of whether there may be features in the bulk and/or bagged cement markets that give rise to one or more AECs in those markets through unilateral market power or coordination (see paragraph 4.20). Because of the volume of evidence and analysis, our interpretation of this material and our competitive assessment are in a separate section of this report (Section 8). Much of the same evidence is relevant to consideration of the possible existence of both unilateral market power and coordination.

7.3 Paragraphs 4.25 and 4.28 contain key extracts from the Guidelines on how the CC will conduct its assessment of unilateral market power and coordination. In light of the Guidelines, as inputs to our assessment of whether unilateral market power or coordination may be giving rise to one or more AECs in the bulk and bagged cement markets in Section 8, in this section we present the evidence and our analysis on:

- aspects of market structure (including the role played by GGBS and PFA);
- market outcomes;
- conduct in the market; and
- the impact of recent market developments.

7.4 We recognize that there is some blurring of the boundaries between what could be considered to be conduct in a market and what could be better considered to be a

market outcome or even part of the structure of the market. In this report, we have categorized our analysis according to our view as to the main aspect of the competitive process to which it is relevant, but this categorization does not affect the weight we put on the analysis, and we note that the same evidence can cast light on more than one aspect of the competitive process.

### ***Market structure***

7.5 In light of what the Guidelines say about pertinent market characteristics for the AEC assessment (see paragraph 4.12) and our unilateral market power and coordination theories of harm (see paragraph 4.20), in this subsection we look at several aspects of the structure of the bulk and bagged cement markets in GB:

- (a) market concentration;
- (b) shares of production capacity;
- (c) product and customer characteristics;
- (d) vertical integration into downstream operations;
- (e) barriers to entry and expansion;
- (f) cement imports;
- (g) the role of GGBS and PFA; and
- (h) other relevant aspects of market structure.

### ***Market concentration***

7.6 Table 7.1 shows the annual cement market shares of GB producers and cement importers (including Aggregate Industries), based on sales volumes of all grey cement (bulk and bagged<sup>1</sup>) in GB, over the period 2007 to 2011.<sup>2</sup>

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<sup>1</sup> Bulk and bagged market shares are shown separately in Appendix 7.1.

<sup>2</sup> We also calculated quarterly market shares on a similar basis (see Appendix 7.1), which showed a lack of volatility from quarter to quarter.

TABLE 7.1 Annual market shares based on sales volume of all grey cement, 2007 to 2011

*per cent*

	<i>GB producers</i>				<i>Cement importers</i>	
	<i>Cemex</i>	<i>Hanson</i>	<i>Lafarge</i>	<i>Tarmac</i>	<i>Aggregate Industries*</i>	<i>Independent importers</i>
2007	22	22	41	6	2	6
2008	21	21	41	7	3	7
2009	22	20	36	9	3	9
2010	21	20	36	9	4	9
2011	21	19	37	9	4	9

Source: Parties' data and CC analysis.

\*Aggregate Industries did not provide sales for 2007. We have estimated sales for 2007 for Aggregate Industries, based on data provided for 2008 to 2011.

†Independent importers comprise [X]. Sales volumes for Independent importers were not always available for each year. Where this is the case, we have calculated volumes for the missing years using linear interpolation.

7.7 Table 7.1 shows that there are four large suppliers of grey cement (the GB producers), and a competitive fringe (the cement importers). The four-firm concentration ratio ranges between 86 and 92 per cent over the period 2007 to 2011, and the three-firm concentration ratio ranges between 77 and 85 per cent over the same period, both of which suggest that the market is highly concentrated.<sup>3</sup> We have also calculated the Herfindahl-Hirschman Index (HHI) based on the market shares in Table 7.1 and find that it varies between 2,220 and 2,744 across the period, also suggesting that the market is highly concentrated.<sup>4</sup>

7.8 We see from Table 7.1 that Cemex has had a fairly stable market share over the period 2007 to 2011, losing in total one percentage point share during the period. Hanson's market share reduced by three percentage points and Lafarge's market share reduced by four percentage points between 2007 and 2011.<sup>5</sup> We can see from Table 7.1 that this loss of market share by Lafarge (and to a lesser extent by Hanson and Cemex) was to the benefit of Tarmac, whose share increased from 6 to 9 per

<sup>3</sup> The concentration ratio measures the combined market share of the largest firms in a market. For example, the 'four-firm' concentration ratio is simply the sum of the market shares of the four largest firms in the market.

<sup>4</sup> The HHI reflects both the number of firms in the industry and their relative size, and is defined as the sum of the squares of all the market shares in the market, thus giving proportionately greater weight to the larger market shares. The HHI ranges between 0, in the case of a perfectly competitive market with infinitely many firms of the same size, and 10,000, in the case of monopoly.

<sup>5</sup> Hanson told us that the decline in its market share had been significant for the review period, falling from about 24 per cent in 2006 to only 18.5 per cent in April 2012, a decline of more than 5 per cent, although it did not tell us what its estimate for its annual 2012 market share was. We do not have data on 2012 market shares at present, and will pursue this following publication of these provisional findings.

cent between 2007 and 2011) as well as to cement importers (Aggregate Industries increased its share by one percentage point over the period for which it provided sales data (2008 to 2011) and independent importers increased their share by three percentage points over the period 2007 to 2011).

7.9 As well as the relatively small annual changes in market shares over this time period (as described in the previous paragraph), our analysis of month-by-month changes in shares of sales (see paragraphs 7.162 to 7.164) showed some correlation between a given GB producer's gains in share in one month and its losses in share the next month, which would help explain the small market share changes we observed on an annual basis.

7.10 We also analysed shares of production of cement in GB over the period 2007 to 2011, as shown in Table 7.2. Over the last five years, Cemex's share of GB production remained fairly constant, increasing from 23 per cent in 2007 to 24 per cent in 2011; Hanson's share remained stable at around 23 per cent between 2007 and 2011. Lafarge Group's share of GB production reduced somewhat over the period, from 46 per cent in 2007 to 43 per cent in 2011; and Tarmac Group's share increased over the period from 8 per cent in 2007 to 11 per cent in 2011.

TABLE 7.2 Shares of production of the GB producers, all grey cement, 2007 to 2011

	<i>per cent</i>				
	2007	2008	2009	2010	2011
Cemex	23	24	26	25	24
Hanson	23	24	23	23	23
Lafarge	46	44	40	41	43
Tarmac	8	8	11	11	11

Source: GB producers' data and CC analysis.

7.11 A very closely related concept is each GB producer's share of volumes sold by all four GB producers. These shares are shown in Table 7.3, and show that, using this

measure, the shares of each of the largest three GB producers varied by no more than two percentage points from 2007 to 2011.

TABLE 7.3 Shares of GB sales of the GB producers, all grey cement, 2007 to 2011

	<i>per cent</i>				
	2007	2008	2009	2010	2011
Cemex	24	23	25	25	24
Hanson	24	24	23	23	22
Lafarge	45	45	41	42	43
Tarmac	7	8	11	10	11

Source: GB producers' data and CC analysis.

7.12 During the same period, there was a large shock in cement demand (see paragraph 2.53). Demand reduced by 13 per cent between 2007 and 2008, and a further 23 per cent between 2008 and 2009 (an overall reduction of 34 per cent in two years). Since then, there has been some small recovery in demand for cement (although demand for cement remains low compared with its 2007 levels): demand for cement increased by 5 per cent in 2010 and by 7 per cent in 2011.

7.13 Table 7.4 shows the shares of production of cement and GGBS in GB of the four GB producers, over the period 2007 to 2011.<sup>6</sup> The trends broadly match those for cement only, shown in Table 7.2, but with Hanson having a significantly higher share of production (as it is the only GB producer of GGBS), and the other producers having correspondingly lower production shares.

TABLE 7.4 Shares of production of the GB producers, grey cement and GGBS, 2007 to 2011

	<i>per cent</i>				
	2007	2008	2009	2010	2011
Cemex	20	20	22	22	21
Hanson	35	35	34	33	33
Lafarge	39	37	34	36	37
Tarmac	6	7	10	10	9

Source: GB producers' data and CC analysis.

<sup>6</sup> We did not include PFA because (a) PFA volumes are not comparable to GGBS volumes and cement volumes and (b) prices of PFA are much lower than those of GGBS and cement, which are close to each other.

7.14 As shown in Appendix 7.1, we also looked at shares of supply on several other bases:

(a) We looked at market shares based on sales volumes of bulk CEM I, volumes of bulk CEM I sold to external customers and volumes of bulk CEM I sold to independent customers and found more variation in these market shares.<sup>7</sup>

(b) We calculated market shares on a regional basis, and found that these showed more variation over the period 2007 to 2011.

*Summary: market concentration*

7.15 Our analysis shows that the supply of cement in GB is highly concentrated and that there have been relatively small annual (and month-by-month) changes in market shares (and shares of sales and production) over the period 2007 to 2011, despite the large slump in demand for cement (see paragraph 2.53). High concentration can be a cause of concern in relation to the both the possibility of unilateral market power and coordination (see the Guidelines, paragraph 101).

*Shares of production capacity*

7.16 Together, the four GB cement producers have ten cement plants in GB with capacity to produce clinker and cement, as well as one further plant without clinker production capacity but with capacity to grind clinker into cement. Our analysis of the cement capacity of each GB cement producer over time is set out in Appendix 7.2.

7.17 Our analysis shows that:

(a) Total cement capacity reduced between 2007 and 2011, as a consequence of the closure of three cement plants (Lafarge's Northfleet and Westbury plants and

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<sup>7</sup> However, these CEM I market share figures reflect to a greater extent than the aggregated figures Hanson's internalization of bulk cement (predominantly CEM I) volumes in 2009 and the loss of external customers which it experienced around the same time.

Cemex's Barrington plant), mothballing of kilns (Hanson mothballed one kiln at Ketton and Cemex mothballed one kiln at South Ferriby) [X].<sup>8</sup>

(b) The only producer to have increased cement capacity during this period was Tarmac, which increased capacity at its Tunstead plant in April 2008 [X].

(c) As a result of these changes in capacity, total capacity to produce clinker in GB reduced from around [X] Mt in 2007 to around [X] Mt in 2011, ie a 27 per cent reduction in clinker capacity which is 'immediately available'. If we also include mothballed capacity by Cemex,<sup>9</sup> total reduction in capacity is [X] per cent over the period.

7.18 Table 7.5 sets out the shares of clinker capacity of the different GB cement producers in 2007 and in 2011.<sup>10</sup> The table shows that Lafarge has the greatest clinker capacity in GB (almost double that of Hanson and Cemex), and that Lafarge has reduced clinker capacity the most since 2007.

TABLE 7.5 GB producers' number of cement plants and shares of clinker capacity in 2007 and 2011

	Number of GB cement plants*		per cent	
	2007	2011	Share of clinker capacity 2007	2011
Cemex	3	2	[20–25]	[20–25]
Hanson	3	3	[20–25]	[20–25]
Lafarge	6	4	[50–55]	[40–45]
Tarmac	1	1	[5–10]	[10–15]

Source: CC analysis based on data from Cemex, Hanson, Lafarge and Tarmac.

\*Only cement plants with capacity to produce clinker are included in this table: grinding, blending and packing plants are excluded.

*Summary: production capacity*

7.19 Our analysis showed that companies' shares of clinker capacity were similar to their market shares. Total cement capacity in GB reduced between 2007 and 2011, and the only producer to have increased capacity during this period was Tarmac. An

<sup>8</sup> Cemex's Rochester plant was closed in 2009 but was replaced by Cemex's Tilbury plant.

<sup>9</sup> Cemex mothballed a kiln relatively recently; [X]. See Appendix 7.2.

<sup>10</sup> We do not show shares for years 2008 to 2010 as these are transition years (capacity changes occurring mid-year), which makes it difficult to calculate comparable annual capacity shares of the different producers.

understanding of companies' capacities, and changes in those capacities, is useful in assessing both unilateral market power and coordination.

### *Product and customer characteristics*

#### *Product differentiation*

- 7.20 Cement is a relatively homogeneous product: although there are different types of grey cement product (CEM I, CEM II and CEM III/IV) with different properties, there is a large degree of demand- and supply-side substitution between the different types of cement (see paragraphs 5.33 and 5.38). Similarly, although bulk and bagged cement are distinct product markets because of the lack of demand-side substitutability between bagged and bulk cement, these are produced from the same materials and there is a large degree of supply-side substitution between them.
- 7.21 The evidence we received from the GB producers regarding the distance over which they sold their cement is in Appendix 7.3. From this evidence, it appears that the geographic areas over which cement can be transported are quite large (for example, up to 100 miles). We also noted that each of the four GB producers sold cement in each GB region.

#### *Demand for cement*

- 7.22 Cement is an input into other products, such as RMX, mortar, concrete blocks and precast concrete products. As such, the demand for cement is derived from demand for RMX and concrete products, and ultimately from demand for construction. As shown in Appendix 7.3, demand for cement is cyclical, with demand in any given year typically being higher in Q2 and Q3, and lower in Q1 and Q4.
- 7.23 Although demand for cement has reduced sharply in recent years as a result of the economic downturn, we did not observe that cement demand was volatile. In

addition, there is a degree of visibility of a proportion of future demand for RMX and concrete products, and ultimately cement, through tendering for large-scale construction projects, which can start several years before the construction project is due to begin. Cement suppliers (or their downstream RMX or concrete products operations) may be approached by construction companies and asked for quotes at the tendering stage, which would give the cement suppliers some visibility over future demand for cement. However, even where cement suppliers are not approached by construction companies at the tendering stage, they may be able to estimate cement needs for the construction projects by reading tender documents, which are sometimes published.

7.24 Further, the GB cement producers supply RMX and in some cases concrete products in addition to cement (see paragraph 2.79). As a result, they have further insight into shorter-term demand for RMX and concrete products, and therefore cement. This insight was unlikely to have warned producers of the scale of the downturn in 2007 to 2009 but in the normal course of events it would allow producers to have a good understanding of short-term demand.

7.25 These factors suggest that even if demand for cement is not particularly stable over time because of its dependence on general economic conditions, the GB cement producers are likely to have some insight into (short-term) demand movements.<sup>11</sup>

#### *Customer characteristics*

7.26 Our analysis of the main characteristics of bulk cement customers, and their purchasing behaviour, is in Appendix 7.9. We found that:

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<sup>11</sup> Cemex told us that the uncertainty in long-term demand introduced significant uncertainty, in particular in relation to capacity decisions. We agreed that capacity decisions would be affected by the uncertainty in long-term demand; however, pricing decisions are unlikely to be affected because these are normally based on shorter-term considerations.

- (a) There were 900 customers (with 3,859 delivery sites) of delivered bulk cement across the period 2007 to 2011, with around 600 customers (with around 2,000 delivery sites, of which approximately 45 per cent are owned by the five Majors) active in any given year. The 20 largest customers (in terms of share of total cement volumes over the period 2007 to 2011, including internal sales) accounted for 77 per cent of total volumes, which includes the five Majors accounting for 61 per cent of total volumes. Just over 200 customers purchased 5 kt or more of cement per year, and made up 95 per cent of total volumes.
- (b) The vast majority of customers who were active in December 2011 had been purchasing cement at least since 2007, meaning that demand for cement tended to be long term.<sup>12</sup> This was particularly the case for large customers (with purchases over 20 kt per year), as well as medium-sized customers (with purchases over 5 kt per year). Customers tended to stay with the same supplier for at least a year, and mostly for longer (two or more years).
- (c) Around 85 per cent of customers sourced cement simultaneously from more than one supplier, but this was not true of individual job sites, of which 82 per cent sourced cement from only one supplier at any one time.
- (d) The vast majority of cement was purchased at least monthly.<sup>13</sup> Again, this was particularly true for large and medium-sized customers.

7.27 We therefore found that customers for bulk cement were largely fixed outlets with demand for cement which was largely predictable in the short term: they tended to purchase cement frequently and customer longevity was high. Although customers with several plants tended to source from more than one cement supplier, there was a high incidence of single sourcing at site level and a high frequency of deliveries.

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<sup>12</sup> The transaction data only started in 2007, and therefore we could not observe the exact year in which customers started purchasing cement where this was prior to 2007.

<sup>13</sup> The transaction data was only available on a monthly (or quarterly in the case of independent cement importers) basis, and therefore we could not observe purchases which occurred on a fortnightly or weekly basis—instead these were treated as monthly purchases.

These factors would contribute to transparency of customer–supplier relationships. Further, the customer base was relatively concentrated (making monitoring of customer–supplier relationships covering the majority of cement volumes easier), but not so concentrated that the loss of a single customer would have a severe impact on profits (with the exception of Major customers and a few larger customers).

- 7.28 We also analysed the characteristics of bagged cement customers<sup>14</sup> (see Appendix 7.9) and found that, as for bulk cement, customers purchasing bagged cement were fairly concentrated, but not so concentrated that the loss of a single customer would have a severe impact on profits (apart from a very few of the largest customers). We also noted that purchases of bagged cement tended to be frequent.

*Summary: product and customer characteristics*

- 7.29 We found that cement is a relatively homogenous product, both in product and geographic terms. While demand for cement is dependent on general economic conditions, there is some transparency of short-term demand movements. The customer bases for bulk and bagged cement are concentrated, but not so concentrated that the loss of a single customer would generally have a severe impact on profits. Customers for bulk cement are largely fixed outlets with demand for cement which is largely predictable in the short term: customers purchase cement frequently (as do bagged cement customers) and there is high customer longevity. There is a high incidence of single sourcing for bulk cement at site level.
- 7.30 These factors contribute to transparency and lack of complexity in these markets, giving companies a greater awareness of their rivals' behaviour, which, in some cases, can contribute to competition problems (eg coordination—see the Guidelines, paragraphs 252 and 254).

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<sup>14</sup> We did not analyse Tarmac bagged customers because [X].

### *Vertical integration*

- 7.31 The Majors consume a significant proportion of the cement they produce (or, in the case of Aggregate Industries, the cement it purchases) in their own downstream operations (largely RMX production but also in certain cases the manufacture of concrete products and mortar). Appendix 2.3, Table 1, shows, for each Major, the total sales of cement which are internal and external, as well as internal sales (ie sales to their own downstream businesses) as a proportion of total sales for the period from 2007 to 2011. Appendix 2.3, Table 1, shows that, during this period, there has been considerable variation between the Majors in the extent of vertical integration from cement into downstream operations, and that, for most of the Majors, there have been significant changes in the extent of internal consumption of cement.
- 7.32 We consider the impact of vertical integration on barriers to entry into the supply of cement in paragraph 7.74, and on the availability of information in the cement market in paragraphs 8.167 and 8.219. The impact of vertical integration on competition in the referred markets (over and above any role it might play in unilateral market power or coordination) is considered in Section 10 of this report.

### *Barriers to entry and expansion into GB cement production*

- 7.33 In this subsection, we consider the potential for entry and expansion into GB cement production to act as a competitive constraint in the supply of cement.<sup>15</sup> We look at possible modes of entry and expansion, the experience of entry and exit for these modes, and the extent of any barriers to entry and expansion. Further supporting evidence is set out in Appendix 7.4.

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<sup>15</sup> We examine the constraint from imported cement, and the potential for entry and expansion via cement imports, in paragraphs 7.58 to 7.106.

*Possible modes of entry and expansion*

7.34 We identified the following possible modes of entry and expansion into the production of cement in GB:

- developing a new cement plant in GB (or expanding an existing one); and
- developing a grinding mill in GB (or expanding an existing one).

*Evidence of past entry and exit*

7.35 There are ten cement production plants in GB with capacity to produce clinker and cement. The most recent commissioning of a cement plant in the UK was at Tarmac's Tunstead works in 2004 where the original wet process plant was replaced by a dry process plant with an annual capacity of 825,000 tonnes. Following investment of £[redacted] million in 2008, the annual capacity was increased to 1 Mt.

7.36 In 2009, Cemex opened a cement grinding mill at Tilbury with an annual capacity of [redacted].<sup>16</sup>

7.37 Five cement works have been closed since 2007, as shown in Table 7.6.

TABLE 7.6 **Cement works closed in the UK since 2007**

<i>Location</i>	<i>Owner</i>	<i>Date closed</i>	<i>Clinker capacity Mt</i>	<i>Reason for closure</i>
Northfleet	Lafarge	2008	[redacted]	[redacted]
Ridham (import terminal)	Lafarge	2008	[redacted]	[redacted]
Barrington	Cemex	2008	[redacted]	[redacted]
Westbury	Lafarge	2009	[redacted]	[redacted]
Rochester	Cemex	2009	[redacted]	[redacted]

Source: Lafarge, Cemex.

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<sup>16</sup> [www.cemex.co.uk/ac/ac\\_pr\\_20090922.asp](http://www.cemex.co.uk/ac/ac_pr_20090922.asp).

*Cement plants: barriers to entry and expansion*

7.38 We considered the evidence relating to the following possible barriers to entering the cement market via the construction of a new cement plant (or expanding production from an existing cement plant):

- upfront investment required;
- availability of raw materials;
- lead time and planning permission;
- emissions regulations;
- economies of scale; and
- barriers to expansion.

7.39 The GB producers<sup>17</sup> told us that the most significant barrier to entry was the capital cost of building a new cement plant. The cost estimates given by individual parties are set out in Appendix 7.4. Estimates varied substantially depending on the capacity of the plant and other assumptions, ranging from £120 million for a small-scale plant up to £360 million for a large plant with an annual capacity of 1 Mt.

7.40 Other parties which do not currently produce cement in GB said that the extremely high capital cost for cement production was a barrier to entry. We were also told that uncertainty over the future demand for cement made financing difficult.

7.41 We were told that a significant barrier to entry was the need to develop a new limestone quarry to provide raw materials, and the associated issues with obtaining planning permission for that quarry. We were told that the quarry reserves would need to be able to support at least 25 years' cement production, which would amount to approximately 50 Mt. We were told that availability of high-quality limestone reserves

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<sup>17</sup> Aggregate Industries does not produce cement in GB. Aggregate Industries told us that it had no experience of cement production and therefore it did not offer any evidence.

could be a barrier to entry, not because limestone is a scarce resource in the UK, but because limestone occurred primarily in areas that were designated as national parks or Areas of Outstanding Natural Beauty and that obtaining planning permission for a new quarry and cement plant in such areas would be very unlikely.

- 7.42 We were told that it would take a considerable time to develop a new cement plant because of the need to identify limestone resources, gather the necessary land holdings and to go through the planning process. Estimates for the length of time required varied depending on whether suitable sites and planning permissions were already in place, but could take 10 to 15 years. We were also told that there would be additional costs arising from the planning process.
- 7.43 Lafarge told us that there were significant uncertainties regarding the future cost to be imposed on carbon emissions. The uncertainty related particularly to the period after 2020 when, subject to carbon leakage considerations, the ETS would require all cement producers to pay for each tonne of carbon emitted (see paragraphs 2.54 to 2.61). It said that these uncertainties weighed heavily against potential new cement plant projects.
- 7.44 Moreover, we note that it may recently have become more difficult for new entrants to obtain carbon allowances than existing producers in certain circumstances. Under phase three of the EU ETS, which came into effect on 1 January 2013, 5 per cent of all free carbon allowances will be set aside in an NER for new installations, including capacity extensions to existing plants, which commence operations after 30 June 2011. Once the NER is exhausted, new installations will be required to purchase any carbon allowances they require (see paragraph 2.60).

- 7.45 The GB producers told us that economies of scale existed as larger cement plants could be operated more efficiently than smaller plants in terms of unit costs, since fixed costs were spread over a greater volume of sales. Average kiln capacity has increased substantially over the last 50 years.
- 7.46 We have not undertaken an analysis of plant-level economies of scale for cement plants. Therefore we have not formed a view on whether larger plants can achieve lower unit costs than smaller plants, although we note that for any given plant, unit costs are likely to fall as production volume increases. We also note that the average kiln capacity in 2009 was over 1 Mt per year, which we consider indicates that small-scale entry is unlikely.
- 7.47 The GB producers told us that some economies of scale arose through operating more than one site, because (a) logistics costs could be reduced if production could be matched better geographically with demand; (b) production could be scheduled efficiently across plants; and (c) overall scale allowed central costs to be spread across a larger volume of output, with procurement savings being achieved as a bulk purchaser. We were also told that being part of a larger group was a benefit in terms of access to technical expertise.
- *Barriers to expansion*
- 7.48 Some of the GB producers told us that, because current levels of capacity utilization were low, there were no barriers to producers increasing production based on existing capacity. This could be achieved by running kilns for longer, operating additional shifts and reinstating mothballed capacity. However, others disagreed, arguing that flexibility was limited because, to operate efficiently, kilns must either run at full capacity, or not at all.

7.49 The GB producers told us that the capital investment required to expand a plant (for example, by way of an additional kiln or additional grinding capacity) was a significant barrier to increasing the capacity of an existing plant. In addition, the requirement for regulatory permissions, the need to secure limestone supplies, the need to remove bottlenecks from the rest of the plant and uncertainty over the cost and availability of future carbon allowances would all be relevant considerations.

*Summary: barriers to entry (or expansion) through building (or expanding) a cement plant*

7.50 We concluded that there were significant barriers to entry through building a new cement plant. The evidence we received indicated that an investment of at least £120 million, and probably closer to £200 million, would be required to develop a cement plant—most, if not all, of which was likely to be sunk. We noted that any such plant would need to be of a substantial scale. The smallest plant currently operational in the UK is [500,000–750,000] tonnes, which represents approximately [5–10] per cent of UK cement consumption.<sup>18</sup> Given these factors, coupled with weak demand in the market (with no significant upturn in demand forecast<sup>19</sup>) and the ability of existing producers to expand output from plants which are currently not operating at full capacity (see the next paragraph), we consider it unlikely that new entry would occur. In addition, we consider that the time required to identify and acquire a suitable site and to obtain planning permission would limit the competition faced by existing producers from new entrants in the medium term, and that planning consent for a new quarry and cement plant would be difficult to obtain in the regions where limestone occurs most readily.

7.51 We found that there are no major barriers to the GB cement producers expanding cement production above current levels within the current individual capacities of

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<sup>18</sup> 2011 UK sales of cement were 8.402 Mt. Source: MPA factsheet on monthly cement sales: [http://cement.mineralproducts.org/documents/Table\\_1\\_Monthly\\_Cement\\_2\\_Oct\\_12.pdf](http://cement.mineralproducts.org/documents/Table_1_Monthly_Cement_2_Oct_12.pdf).

<sup>19</sup> We note that cement demand may increase in future.

their existing cement plants in GB. We noted, however, that there could be considerable costs and other barriers to increasing production at an existing cement plant above its current capacity limit. These would depend on the precise circumstances at each cement plant, but could include the need for significant capital investment and appropriate planning permissions, and the status of any additional capacity under emissions regulations. The GB cement producers could also expand existing cement production above their current capacity limits by bringing mothballed capacity back into production, where they have such capacity. The cost to do so would depend on the condition of the mothballed facilities and the circumstances at the cement plant concerned.

*Cement grinding mills: barriers to entry and expansion*

- 7.52 An alternative model for entry into the production of cement is to build a grinding mill (where clinker from a cement kiln is ground to the fine powder with other materials—see paragraph 2.44—to make cement) and source clinker from elsewhere.
- 7.53 Although a grinding mill can be developed at a lower cost than establishing an integrated cement plant, the capital investment is still likely to be considerable. Cemex opened a grinding mill with an annual capacity of [redacted] at Tilbury in 2009 at a cost of £[redacted] million.<sup>20</sup> However, some of the GB producers told us that a new grinding mill could be developed more cheaply, at a capital cost of £15–£30 million.
- 7.54 GB producers commented that obtaining a reliable supply of clinker should not be considered a barrier to entry as it was an internationally traded commodity and could easily be imported from other sources. However, we considered that imported clinker would face a similar cost disadvantage to imported cement (see paragraphs 7.87 to

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<sup>20</sup> [www.cemex.co.uk/ac/ac\\_pr\\_20090922.asp](http://www.cemex.co.uk/ac/ac_pr_20090922.asp).

7.90). Together with the capital cost of establishing a grinding mill, we considered that this would act as a barrier to entry into the cement market by this route.

7.55 As with expansion of cement production at the existing GB cement plants (see paragraph 7.51), we found that there would be few barriers to the expansion of cement production at the existing GB grinding mills within their current capacity limits, provided sufficient clinker were available. However, considerable barriers could exist (depending on the precise circumstances of each grinding mill) to expanding cement production above the current capacity limit of any particular mill, including the capital cost and the need for appropriate planning permissions.

*Summary: barriers to entry and expansion into GB cement production*

7.56 We found that there were significant barriers to entry into GB cement production, whether via building a new cement plant or via establishing a new cement grinding mill. We found that there were few barriers to the expansion of cement production at the existing GB cement plants and grinding mills within their current capacity limits. However, considerable barriers could exist (depending on the precise circumstances of each cement plant or grinding mill) to expanding cement production above the current capacity limit of any particular plant or mill.

7.57 High barriers to entry can be a cause of concern in relation to the both the possibility of unilateral market power and coordination (see the Guidelines, paragraphs 207 and 255). In assessing the impact of high barriers to entry on competition, the existence of few barriers to expansion for companies already in the market also needs to be taken into account.

## *Cement imports*

7.58 In this subsection, we assess the strength of the competitive constraint from imports on GB-produced cement:

- (a) We examine the ownership, market shares and capacity of importers.
- (b) We assess the extent of any barriers to entry and expansion into the supply of cement in GB via cement imports (other than transport costs, which we considered as part of our assessment of the costs of importing cement). Further supporting evidence relating to the extent of barriers to entry and expansion via cement imports is set out in Appendix 7.4.
- (c) We consider evidence on the costs of importing cement into GB and how these compare with the variable costs of producing cement in GB.
- (d) We consider evidence on the general competitiveness of cement imports, including evidence on the amount of switching by customers between GB producers and importers of cement, the views of importers, evidence gathered from internal documents from the GB producers, and the views of cement customers on imported cement.
- (e) We consider Aggregate Industries as an importer of cement, and we explore its ability to constrain cement prices in GB.

### *Background on importers and market shares*

7.59 Bulk, and to a smaller extent bagged, cement is imported to GB through import terminals. There are around 30 import terminals in GB, of which around 16 are operated by the Majors and the remaining 14 by independent importers.<sup>21</sup> Our focus is primarily on independent importers in this subsection, as Aggregate Industries (which imports significant quantities of cement) sells low quantities of cement externally.

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<sup>21</sup> We use the term 'independent importers' to refer to importers which are not a subsidiary of one of the Majors. While some of these independent importers are owned by non-GB cement producers, none has GB cement production facilities.

However, we also analysed any constraint from Aggregate Industries on GB producers (see paragraphs 7.101 to 7.104).

7.60 The evidence available to us indicated that all grey cement imported into GB currently was CEM I. We were told that there were no imports of CEM II/III into GB, but that it would be possible for importers to blend CEM I with cementitious products (eg PFA or GGBS) to produce CEM II and CEM III. In addition, some independent importers import GGBS and/or PFA.

7.61 Appendix 7.5 contains a list of the 11 independent importers bringing cement into GB, and their terminal locations. Appendix 7.5 also shows each independent importer's annual volume of imports of bulk cement for the period 2007 to 2011 inclusive, alongside imports by Aggregate Industries and the GB producers. The figures suggest that annual imports by independent importers total between [redacted] and [redacted] Mt and have remained largely flat in volume terms between 2007 and 2011.

7.62 Six new cement import terminals have been opened since 2007, as shown in Table 7.7. These new facilities have the capacity to account for only a small proportion of annual UK cement consumption, which in 2010 was 9 Mt, comprising 7.8 Mt from domestic production and 1.2 Mt from imports.<sup>22</sup>

TABLE 7.7 Cement import terminals opened in the UK since 2007

<i>Location</i>	<i>Owner</i>	<i>Date opened</i>	<i>Estimated capacity (tonnes per year)</i>
Blythe	Sherburn	2007	[redacted]
Southampton	Dudman Group	2007	[redacted]
Workington	Thomas Armstrong	2008	[redacted]
Lowestoft	Dudman Group	2010	[redacted]
Garston	Dudman Group	2011	[redacted]
[redacted]	Dudman Group	2012	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

Source: Lafarge, Dudman Group, Quinn.

Note: N/A = not available.

<sup>22</sup> [http://cement.mineralproducts.org/documents/Cement\\_Industry\\_Key\\_Facts\\_and\\_Figures.pdf](http://cement.mineralproducts.org/documents/Cement_Industry_Key_Facts_and_Figures.pdf).

7.63 In Appendix 7.5, we use figures on sales volumes to calculate the market share held by independent importers and Aggregate Industries. We see that the independent importers' collective market share of all grey cement (ie bulk and bagged) has increased over time, from 6 per cent in 2007 to 9 per cent in 2011. Aggregate Industries' share has also grown, from 2 to 3 per cent over the same period. Appendix 7.5 also shows the independent importers' collective market share of bulk cement, which has increased from [redacted] per cent in 2007 to [redacted] per cent in 2011, alongside Aggregate Industries' share of bulk cement, which has remained at [redacted] per cent across the period.

#### *Capacity for imports*

7.64 Import capacity depends both on the amount of spare production capacity in the countries of origin and on the availability (and ease of expansion) of capacity to store cement at import terminals.<sup>23</sup>

7.65 Since 2008, demand for cement has fallen dramatically in many countries, in response to adverse macroeconomic conditions, and several countries have significant excess capacity at a national level. For example, in an internal document from 2011, Hanson mentions [redacted]. Cemex stated that there was significant excess capacity in some EU countries after the collapse of their construction booms (eg Spain, Portugal and the Republic of Ireland).

7.66 In addition to demand for cement dropping and several countries developing significant excess capacity at national level, the rules for how carbon emission allowances are allocated under the ETS have recently changed (see paragraphs 2.59 and 2.60, and Appendix 2.2). The GB cement producers told us that new rules would create an incentive for overseas producers not to reduce output in response to declining

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<sup>23</sup> We note that it is also possible to import some cement via ferry, using trucks.

domestic demand, and that the resulting excess volumes would to some extent be exported to GB. We analysed whether the new rules would create an incentive to maintain output despite reduced demand. We found that the new rules were likely to provide such an incentive, but that this was not sufficient to conclude that there would be a material change in the extent of GB cement imports. In addition to there being an incentive to maintain output, a material change to GB cement imports would necessitate significant over-production, with a sufficient fraction of the excess production being exported to GB.

7.67 In Appendix 7.5 we also estimate the additional volume of cement that could be produced in the Republic of Ireland and Northern Ireland due to changes in the rules for how carbon allowances are allocated under the ETS.<sup>24</sup> This volume is estimated to be approximately 550 kt. While we believe it likely that any additional volume produced would be exported, we note that not all Irish cement exports in recent years have been to GB. In 2012, a significant fraction of Irish cement exports was shipped to non-GB markets. We did not carry out similar analyses for other countries mentioned by parties as candidates for increasing their cement exports to GB (such as Spain and Greece). However, we note that these countries are further away from GB than the island of Ireland and would therefore be likely to export a lower fraction of any additional cement production to GB and would face an even greater cost disadvantage (through higher shipping costs) than Irish producers in doing so. Further, we noted (as set out in Appendix 7.5) that even if all the additional output from cement works in the island of Ireland were to be exported to GB, this would represent no more than about 6 per cent of GB cement consumption (using 2011 figures). In any event, regardless of the origin of imported cement, our analysis (see paragraphs

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<sup>24</sup> We focused on the island of Ireland as data was available and we considered Ireland to be a particularly strong candidate for exporting additional cement to GB due to its geographic proximity to GB.

7.87 to 7.90) shows that GB producers have the flexibility to set prices considerably lower than cement importers.

7.68 The evidence we received from importers (see Appendix 7.5) confirmed that they had spare capacity for importing cement at their terminals.

*Cement imports: barriers to entry and expansion*

7.69 We considered the evidence relating to the following possible barriers to entering the UK cement market using imported cement (or expanding existing cement import operations, as relevant):<sup>25</sup>

- access to an import terminal;
- source of supply;
- upfront investment required;
- vertical integration of the GB producers;
- access to shipping;
- incumbent reaction; and
- customer reaction.

7.70 The GB producers considered that barriers to entry for importing cement (and barriers to expansion of existing cement import operations) were low. They told us that access to an import terminal could easily be secured. They also said that there were numerous ports and wharves that were suitable for importing cement and that it was simple to convert existing storage facilities (such as grain silos) for cement. In addition, it was suggested that cement could be imported by road tankers and trucks, without using a specialist import terminal.

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<sup>25</sup> Transport costs may also be a barrier to entry—these are considered in paragraphs 7.80–7.91.

- 7.71 We received more mixed evidence from other GB cement suppliers. Some told us that there were only a limited number of ports suitable for import terminals, particularly for larger ships requiring deepwater facilities, and suitable facilities were unlikely to become available to new entrants. However, one new entrant told us that it had had no difficulty finding a port.
- 7.72 The GB producers told us that cement was readily available for import owing to international overcapacity, particularly from Spain and the Republic of Ireland. However, some cement importers disagreed, and said that the main barrier to entry was securing a reliable or competitively-priced source of supply. We examine the evidence on availability of cement for import in paragraphs 7.59 to 7.61 and 7.65 to 7.67.
- 7.73 The GB producers estimated that the cost of setting up a cement import terminal could be between £[redacted] and £1 million. We were told that the capital cost of establishing a new deepwater terminal would be considerably higher.
- 7.74 One concern raised with us was that the market available to independent cement suppliers had reduced over the last 20 years because the GB cement producers had integrated vertically into RMX production and now supplied their own RMX plants with their own cement. We were told that this had made the cement market less attractive to new entrants because it reduced the size of the market addressable by independent cement suppliers. We note that in 2011, approximately 41 per cent of all bulk cement purchased in the UK was purchased by the GB producers (either from their own plants or from the other GB producers); approximately [redacted] per cent was purchased by Aggregate Industries and the balance (about half of all bulk cement purchased in the UK) was purchased by non-GB producers.

- 7.75 Hanson told us that shipping capacity was readily available, and we received no evidence to the contrary.
- 7.76 A cement importer told us that the possible reaction by incumbent suppliers (which might include impugning the entrant's reputation and lowering prices) was a barrier to entry. We assess the evidence on the GB producers' behaviour in response to cement importers in paragraph 7.97.
- 7.77 Titan told us that it thought a new entrant might face reluctance from customers to change to a new supplier; however, a GB producer said that it had experienced customers switching away to importers and that it saw no reason to believe that customers would not be prepared to switch to a new entrant supplier given their willingness to switch to importers generally. We assess the evidence on customers switching between GB cement producers and cement importers in paragraphs 7.99 and 7.100.
- 7.78 We found that the cost of establishing a new cement-importing operation would be likely to be significantly lower than the costs of a new cement plant or grinding mill. However, in our view, the extent of vertical integration by the GB producers into downstream operations (including RMX) raises the barriers to entry for a new cement import operation (and limits the ability of existing cement importers to expand), by reducing the number of potential customers for their cement. There are also other barriers to entry in terms of the substantial short-run cost advantages of the GB producers over cement importers (see paragraphs 7.87 to 7.89) and the reaction of the GB producers to cement importers (see paragraph 7.97).

7.79 There appear to be few barriers to the expansion of cement imports within the capacity limits of the existing cement import terminals (see paragraphs 7.64 to 7.68).<sup>26</sup> Expanding the volume of cement imports at any particular terminal beyond that terminal's current capacity would require some capital investment (although this would be likely to be much less significant than in the case of expansion of a cement plant or grinding mill) and would depend on the availability of space at suitable ports. However, all such additional cement brought into GB by an existing importer would face the same cost disadvantage as cement imported by a new entrant (see paragraph 7.78).

*Competitiveness of imports and costs of imported cement*

7.80 The ability of imports to compete successfully with GB-produced cement depends mainly on the price at which imports of cement can be sold profitably in GB. This in turn depends primarily on the costs of producing cement in the country of origin, the exchange rate, the cost of transporting cement to, and storing the cement in, GB import terminals, any other import costs (such as import levies) to the extent they apply, and the additional costs of transporting the cement to customers within GB.

7.81 The fact that there are currently imports into GB shows that, at the current level of GB cement prices, it is possible to derive positive margins from importing cement into GB.<sup>27</sup> However, the extent of the constraint imposed by imports on GB prices will depend also on whether importers would be able to expand sales significantly and profitably by undercutting the GB producers of cement. This will depend, among other things, on the relative costs of importing cement into GB compared with the costs of producing cement in GB. If importers are able to expand sales in GB at similar, or lower, costs than GB producers, they may have an incentive to signifi-

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<sup>26</sup> However, in the case of Aggregate Industries, it told us that [REDACTED].

<sup>27</sup> Hanson told us that the presence of importers in the GB market had grown from [REDACTED] in the 1980s to some [REDACTED] per cent today.

cantly undercut GB producers in order to gain sizeable share of the GB market. However, if importers operate at higher costs than GB producers, they may not have the capability to undercut GB prices by much, or at all. If importers face significantly higher average variable costs to serve GB customers, it may therefore be in their best interests to remain fringe players and set import prices in line with GB producer prices.

7.82 In the following paragraphs, we assess:

- (a) evidence on various elements of cost that will affect the final price of imported cement;
- (b) evidence on the catchment area for imports (ie the distance from import terminals over which imports appear to be price competitive against GB-produced cement);  
and
- (c) evidence on the competitiveness of imports more generally, including customer views on the attractiveness of imports and evidence of customers switching to imports, and views from importers on their ability to compete with GB-produced cement.

- *Costs of imported cement*

7.83 In the following paragraphs, we summarize the evidence we have obtained regarding the different elements of the variable costs of importing cement, and compare these costs with the variable cost of producing cement in GB. We first review the evidence we received on the costs of producing cement in provenance countries. We next review the evidence on the costs of shipment of imports to GB. We then review

evidence on the total costs of producing and shipping imports to an import terminal, and compare this with evidence on the ex-works costs of producing cement in GB.<sup>28</sup>

- *Price of cement internationally*

7.84 We obtained data from independent importers on the average costs to them of sourcing cement in the provenance countries before shipment, ie free on board (FOB)<sup>29</sup> costs. We also obtained data from the GB cement producers on the average FOB costs to them of sourcing cement produced in other countries.<sup>30</sup> We noted that, in addition to importing cement and possessing knowledge of import costs directly, the GB producers (excluding Tarmac) were part of global groups that had international cement trading operations through which they would have good information about the FOB prices of cement in other countries (as well as shipping costs). The various estimates we obtained for the cost of sourcing cement from outside GB are in Appendix 7.5.

7.85 We found that the costs of imported cement were of the order of £[~~xxx~~] to £[~~xxx~~] per tonne on average before shipping to GB import terminals and before delivery to GB customers. Costs of imported cement have increased over time, from an average of £[~~xxx~~] (all imports) or £[~~xxx~~] (independent importers) per tonne in 2007.

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<sup>28</sup> This analysis does not take into account the costs of transporting cement from import terminals to customers in GB, or from GB cement plants to customers. Import terminals may be located close to centres of cement demand, such that delivery costs from import terminal to end-customers may be low. This is not always the case of cement plants, although we note that GB producers tend to have depots close to demand centres, and that these depots are connected to cement plants via rail links, which makes transport of GB produced cement to such rail-linked depots relatively cheap. Any further transport costs from depots to the end-customer are then likely to be comparable to those faced by importers.

<sup>29</sup> The FOB price is the price of a product including the cost of the product and the cost of loading it on to freight vehicles at the point of sale but excluding the cost of transporting the goods from the point of sale to the buyer. We note that the FOB cost of imported cement will typically reflect the ex-works variable cost of producing cement in provenance countries, and is therefore likely to contain a margin paid to the originating cement producer. However, from the viewpoint of the (independent) cement importer, this is the price at which it purchases cement, and is therefore a purely variable cost.

<sup>30</sup> Lafarge provided costs on a 'cost, insurance and freight' (CIF) basis, which we understand to be the cost of cement landed in GB, including shipping costs, insurance and any other handling charges. We have calculated FOB costs for Lafarge by subtracting average shipping costs from the CIF costs. However, this may overestimate the FOB costs somewhat, as we were unable to subtract insurance costs, and any other costs which are included in the CIF estimate. Where costs were provided in euros, we have converted these to pounds sterling using average exchange rates for the year. Where more than one cost was provided for a given country of origin and year (because the port of entry into GB differed), we have calculated a weighted average cost (using volumes) for the country of origin and year.

- *Shipping costs*

7.86 Shipping is a significant additional cost for importers compared with GB producers of cement. Appendix 7.5 contains estimates by the GB producers and cement importers of the cost of shipping cement to GB terminals from various different locations. These estimates suggest that, on a simple average, importers incur a freight cost of £[redacted] per tonne overall, although this varies by country of origin. The average is the same whether only independent importers are considered, or whether all imports are included. There have been fluctuations in the cost of freight over time, from a low of £[redacted] (£[redacted]) in the case of all imports (independent importers) in 2007 to a high of £[redacted] (£[redacted]) in 2008, before falling to £[redacted] in 2011.

- *Overall costs of imported cement*

7.87 We found that the overall average variable costs of importing cement were of the order of £[redacted] to £[redacted] per tonne to GB terminals in 2011 and that the average variable ex-works costs for GB-produced cement were of the order of £[redacted] to £[redacted] per tonne (see Appendix 7.5) for the same year.<sup>31</sup> This suggests that GB producers have the flexibility to set prices considerably lower than cement importers while still making a contribution to fixed costs in the short run.

7.88 We noted that GB producers had higher fixed costs than the importers for which we had detailed data, and therefore long-run marginal costs of production for the GB producers and the importers might not be dissimilar. However, the relevant cost concept for this analysis is short-run average variable costs, as these costs will determine the ability of the GB producers to price importers out of the market.

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<sup>31</sup> We have defined variable costs as those costs that necessarily vary in line with small changes in production volumes at an active production site, and to a lesser extent, sales volumes.

7.89 We also analysed the cost structures of cement importers using profit and loss data from four independent importers (see Appendix 6.6). We analysed whether the independent cement importers had any cost disadvantage when competing against the GB producers' cement divisions by comparing each cement importer's unit total costs (as measured by total cost per tonne sold) against the average ex-works market price of cement produced in GB (as measured by unit net revenues from external sales of the Majors' cement divisions). We found that for the cement importers we analysed, unit total costs were generally higher than the average ex-works price of domestically-produced cement. Therefore, even before taking into account a cement importer's own required margin, the cement importer had a cost disadvantage in competing against the price of domestically-produced cement.

7.90 Cement importers' evidence to us indicated that they were aware of their cost disadvantages compared with the GB producers. In our view (which was confirmed by several cement importers—see paragraph 7.94), cement importers were likely to be cautious about significantly undercutting the prices of the GB producers, as cement importers were able to anticipate the ability of the GB producers to react by pricing a particular importer out of the market more generally. We found that the cement importers therefore had incentives to price their cement just below the price of GB-produced cement.

- *Geographic scope of imported cement*

7.91 We also considered evidence on the geographic scope of imported cement (see Appendix 7.5). There was evidence that the majority of individual importers sold most of their cement within about 100 miles or less of their terminals. However, we did not think that this limited the geographic scope of imported cement materially when cement importers were considered collectively, given the number and distribution of

cement import terminals around GB, and the relative accessibility of all parts of GB to the coast.

*Evidence from importers, GB producers and customers on the competitiveness of imports*

7.92 In the following paragraphs, we summarize evidence on the competitiveness of imports from:

- (a) importers;
- (b) the GB producers; and
- (c) customers.

7.93 Details of this evidence are in Appendix 7.5.

7.94 Importers made the following main points:

- (a) Imported cement was fully substitutable with GB-produced cement. Any concerns expressed by customers about quality or security of supply were more perceived than real.
- (b) Importers were generally able to compete with GB producers, particularly when the customer was close to an import terminal. However, the low prices of the GB producers could be a problem, and it was, for example, easier to compete in areas that were distant from the GB producers' plants.
- (c) GB producers' costs were lower than those of the importers, and the GB producers had spare capacity. Therefore the importers were cautious in setting their prices as they were vulnerable to the GB producers responding by dropping their prices for key customers.
- (d) Importers had some vulnerability to exchange rate fluctuations.

7.95 Our analysis of the margins of the independent importers for whom we had data (see Appendix 6.6) showed that their margins were volatile and had declined over time,

notwithstanding stable or increasing price trends. The independent importers' EBITDA margins were significantly lower than the GB producers' EBITDA margins (although we noted that the GB producers had greater capital intensity and would have higher target returns on capital employed (ROCEs) than the importers).

7.96 We noted that, as set out in paragraph 3.71, Dudman Group—the largest importer of cement into GB without its own cement production capability—went into administration in mid-January 2013.

7.97 The evidence from GB producers (as set out in Appendix 7.5 and as described in paragraphs 8.74 and 8.146 to 8.149) indicated that:

- (a) GB producers monitored imports in some detail.
- (b) GB producers regarded imported cement to be substitutable—and highly competitive—with GB-produced cement.
- (c) GB producers were concerned about the growth in imports and the effects of the ETS (see paragraphs 7.66 and 7.67, and 11.28 to 11.30).
- (d) On occasion, GB producers acknowledged the logistics disadvantages faced by imported cement.
- (e) There were cases of strategic behaviour by the GB producers aimed at containing the threat from cement imports (including consideration, and in some cases taking, of specific steps: to restrict the supply of cement to importers; to acquire import terminals and/or importers; to leverage contacts with importers in other markets; and to target lower-priced cement selectively at customers of cement importers).

7.98 The evidence from cement customers on imported cement included that:

- (a) In general, customers felt that they were able to obtain what they considered to be competitive quotes from cement importers (although one customer noted that

it had found that the cement importers were unable to match the GB producers' prices, in part because of the location of that customer's operations).

- (b) There were some perceptions of possible quality concerns with imported cement.
- (c) There were few concerns over security of supply, although one customer said that it had a preference for domestic cement over imported cement in part due to security of supply.
- (d) Customers were able to use quotes from cement importers and/or the threat of importing their own cement in their negotiations with the GB producers.
- (e) Customers whose threats to import their own cement were particularly credible were able to gain unusually favourable terms for GB cement supply.

*Switching between GB-produced cement and imported cement*

7.99 We examined the extent of customer switching between GB producers and independent importers. We analysed data provided by GB producers and some importers, and then reviewed evidence of the GB producers' reactions to customer switching to importers. Our analysis is in Appendix 7.5.

7.100 We found that there was some switching between GB producers and importers, but that this tended to be low as a proportion of each GB producer's annual sales. The GB cement producers told us that data on switching to importers might underestimate the competitive threat from importers, because of the constraints from threats to switch. They told us that they often had to reduce prices to customers (or increase prices less than forecast) in reaction to threats to switch to importers, and provided examples of this.<sup>32</sup> On the other hand, importers told us that switching from GB producers to importers tended to be temporary, and that GB producers tended to attempt to win back lost business by reducing prices. Lafarge told us that attempting to win back lost business by lower prices was a normal part of the competitive pro-

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<sup>32</sup> See Appendix 7.5.

cess, and that while Lafarge might have attempted to win back lost business, it had not always been successful. However, (a) because there is price discrimination in the supply of cement (see paragraph 7.159), GB producers offering customers who have switched to importers lower prices to win them back does not generate downwards pressure on prices for all of the GB producers' customers, and (b) if GB producers have more flexibility on prices than the importers due to marginal cost advantages (as our analysis suggests) and the GB producers attempt to win back lost business by reducing prices, then it will be difficult for importers to retain customers or grow their businesses.

### *Aggregate Industries*

7.101 Aggregate Industries has four import terminals in GB, which are located in the North-West, South-East, South-West and Scotland. Aggregate Industries did not provide figures for the capacities of its import terminals, stating that it could not 'provide any meaningful estimate of the limits on the amount of cement that Aggregate Industries can import through each of its four import terminals'.<sup>33</sup>

7.102 Aggregate Industries told us that it imported cement into GB from Holcim's [REDACTED] plant in Germany. It imported around [REDACTED] tonnes of cement in 2011, almost exclusively for internal use [REDACTED] were for internal use and [REDACTED] tonnes were sold externally, [REDACTED]. In addition, Aggregate Industries purchased around [REDACTED] tonnes of cement in 2011 predominantly from GB producers [REDACTED].

7.103 Further details of Aggregate Industries' purchases of cement are in Appendix 7.5, including maps showing the location of Aggregate Industries' cement-purchasing plants, their annual value of cement purchases and the origin of their cement

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<sup>33</sup> However, as noted in the footnote to paragraph 7.79, Aggregate Industries told us that [REDACTED].

purchases. The maps show that Aggregate Industries tends to purchase cement internally (ie use imported cement from its sister company Holcim Germany) [✂].

7.104 We considered that Aggregate Industries' actual imports, as well as the threat of further imports, could be used as leverage by Aggregate Industries in price negotiations with the GB producers, but were unlikely to have an impact on the prices paid for cement by independent customers, as Aggregate Industries sold very low volumes of cement externally in GB.

*Summary: cement imports*

7.105 We assessed the strength of the competitive constraint from imported cement on GB-produced cement. We noted that, while independent importers had experienced some growth in their collective share between 2007 and 2011 (from 6 per cent in 2007 to 9 per cent in 2011), their collective share of GB cement sales remains small and the total volumes imported have not increased. We also note that all of the increase in importers' collective share took place in 2008 and 2009. Since then, independent importers' collective share has remained stable. We found that, although there was evidence that the GB producers regarded imported cement as a competitive threat, the strength of the competitive constraint from imported cement was limited because:

- (a) The GB producers had a substantial short-run cost advantage over cement importers in competing for customers at the margins.
- (b) The higher costs faced by cement importers created incentives for them to price their cement just below the price of GB-produced cement.
- (c) The GB producers considered, and in some cases took, specific steps to undermine the viability of imported cement, such as applying pressure to restrict cement supplies to independent importers, purchasing of import terminals and/or

importers; leveraging of contacts with importers in other markets; and targeting lower-priced cement selectively at customers of cement importers.

7.106 The limited constraint from imported cement is of concern both in relation to unilateral market power (in that it may reduce a source of additional rivalry to any company seeking to exercise such market power) and coordination (in that it may contribute to the external stability of coordination—see the Guidelines, paragraph 255).

### *GGBS and PFA*

7.107 As explained in Section 2 of this report, GGBS and PFA are materials that can be added to cement made from clinker to produce different types of grey cement, or to replace a proportion of cement made from clinker when making concrete. Thus GGBS and PFA can be used either:

(a) by cement producers, to replace part of the ‘clinker’ element of cement to produce CEM II and CEM III (‘blended cements’); there are three main types of cement used in GB:

- CEM I, which is made from ground cement clinker and a small percentage of gypsum to control the material’s setting time when mixed with water;
- CEM II, which contains between 6 and 35 per cent PFA, limestone or GGBS; and
- CEM III, which contains between 36 and 95 per cent GGBS; or

(b) directly by RMX or concrete block producers, to mix with CEM I in order to create customized mixes of concrete (which results in the production of concrete that is effectively identical to concrete made from pre-blended CEM II or CEM III).

7.108 Therefore, GGBS and PFA are both ‘partial substitutes’ to clinker in the manufacture of cement, though there are limits to the extent to which they can be used to substi-

tute for clinker, and there are also differences between the extent of substitutability of GGBS and PFA.

7.109 Details of the production processes for PFA and GGBS are contained in Appendix 7.6.<sup>34</sup> In this subsection, we first summarize views from cement producers and cement customers on the extent of substitutability between PFA and GGBS. We then present our estimates of production and shares of sales of both GGBS and PFA. The last part of this subsection describes the contractual arrangements between Hanson and Tarmac for the supply of granulated blast furnace slag (GBS), our analysis of volumes and prices of GGBS in GB and some internal documentary evidence on the supply into the reference markets of GGBS.

#### *Substitutability between PFA and GGSB*

7.110 We were told that blending PFA or GGBS into CEM I was cheaper for an RMX producer than using just CEM I. We understand that in many cases, RMX will be produced using some PFA or GGBS, or pre-blended CEM II/III. Most estimates we received from RMX producers (including the Majors) suggest that GGBS or PFA is used in around 80 per cent of all RMX that is sold to customers.<sup>35</sup>

7.111 Views on the substitutability between PFA and GGBS, and on their relative merits, varied (see Appendix 7.6). We were told by some parties that PFA tended to be of more variable quality, but that it was available from more sources and generally cheaper, whereas the supply of GGBS was more restricted. Some parties told us that GGBS had superior cementitious properties. We were also told that there were pros

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<sup>34</sup> In relation to the production of the GGBS, it is of particular note that, in the UK, Tarmac and the GB steel producers (Tata Steel and SSI) have entered exclusive contracts whereby Tarmac has the exclusive rights and obligation to remove all slag produced including blast furnace slag from each of the three GB steel plants. [§]. Tarmac then sells GBS to Civil & Marine (Hanson) under an exclusive long-term contract, and Hanson undertakes the grinding to transform the GBS into GGBS. We present more details on the exclusivity arrangement in a separate subsection below.

<sup>35</sup> Hanson told us that PFA or GGBS was used in about 80 per cent of RMX produced. Newark Concrete told us that 95 per cent of its customers purchased CEM II and did so because of the cost saving (see:

[www.competition-commission.org.uk/assets/competitioncommission/docs/2011/anglo-american-lafarge/summary\\_of\\_hearing\\_with\\_newark\\_concrete.pdf](http://www.competition-commission.org.uk/assets/competitioncommission/docs/2011/anglo-american-lafarge/summary_of_hearing_with_newark_concrete.pdf)).

and cons for both GGBS and PFA, and that each had its own merits depending on the particular application.

*GGBS: production, sales and market shares*

7.112 Hanson has an exclusive contract for the production of GGBS in GB. All other GGBS supplied in GB is imported. Our understanding is that Lafarge, Aggregate Industries and [redacted] are currently importing GGBS into GB. We understand that [redacted] recently ceased importing GGBS into GB—we do not have estimates for its imports of GGBS, but these were likely to be low. Cemex also used to import GGBS, but ceased in 2009. Further details of GGBS imports are in Appendix 7.6.

7.113 Our estimates of total production and imports of GGBS are presented in Table 7.8. Using this data, we also computed estimated market shares for the supply of GGBS in GB in Table 7.9. Total sales of GGBS were around 1.4 Mt in 2011, and have reduced between 2007 and 2011 by about 1 Mt.

TABLE 7.8 Estimated production and sales of GGBS in Great Britain, 2007 to 2011

	<i>Tonnes</i>				
	2007	2008	2009	2010	2011
Hanson GGBS production	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Lafarge GGBS imports	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cemex GGBS imports	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Aggregate Industries GGBS imports	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[An independent]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Others ([redacted])*	Unknown	Unknown	Unknown	Unknown	Unknown
Total known	2,496,615	2,104,973	1,382,930	1,291,595	1,418,039

Source: Hanson, Lafarge, Cemex, Aggregate Industries, [redacted].

\*We understand this amount to be very small and it will have no substantial impact on the total.

TABLE 7.9 Estimated shares of supply of known GGBS volumes, 2007 to 2011

	<i>per cent</i>				
	2007	2008	2009	2010	2011
Hanson	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Lafarge	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cemex	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Aggregate Industries	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[An independent]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total	100.0	100.0	100.0	100.0	100.0

Source: CC calculations based on Table 7.8.

7.114 These estimates show that Hanson has increased its market share between 2007 and 2011, largely as a result of [REDACTED] having gradually ceased to import GGBS in 2009 and 2010. Although there is an increase in the share of supply of GGBS by [REDACTED] and [REDACTED] in 2011 through increased imports, their shares in absolute terms are very small. Overall, the share of GB-supplied GGBS held by Hanson is very high—of the order of 84 to 94 per cent depending on the year. These estimates are in line with the estimates of GGBS market shares that we see in Hanson internal strategy documents where GGBS market shares are generally reported to be between 85 and 95 per cent depending on the year.

7.115 Our calculations suggest that Hanson has a large amount of spare capacity for grinding GBS to produce GGBS: total capacity for grinding GBS held by Hanson is around 2,920 kt per year.<sup>36</sup> Data provided by Hanson shows that production of GGBS fell from about [REDACTED] Mt in 2007 to about [REDACTED] Mt in 2011, therefore suggesting a reduction in capacity utilization of 27 percentage points, if currently mothballed capacity is included in the calculation.<sup>37</sup>

7.116 Regarding the profitability of importing GGBS, Lafarge told us that it bought GGBS from Hanson, but also imported GGBS from Spain, and that this was cheaper than buying GGBS domestically. It said that the volumes it imported were small, and were only for its own use. It told us that the GGBS that it purchased from Spain already had limestone in it, so it could not receive 'CE' marking and therefore Lafarge could not sell it in the UK. Lafarge said that it used all the GGBS it imported to produce CEM III which was compliant with all the relevant cement standards, which Lafarge then supplied mainly to its own RMX operations, but also to external customers.

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<sup>36</sup> Source: Hanson website [www.heidelbergcement.com/uk/en/hanson/home.htm](http://www.heidelbergcement.com/uk/en/hanson/home.htm).

<sup>37</sup> Hanson told us that the capacity figure should be [REDACTED] Mt and not [REDACTED] Mt, which would mean that capacity utilization fell by 32 percentage points over this period, according to our calculations. Hanson did not agree with our capacity utilization calculations. It told us that, once the correct figures for capacity—and the mothballing of two of its plants—were taken into account (in part, linked to fluctuations in the availability of raw material), its estimate of its current capacity was around [REDACTED] Mt (indicating that its 2011 production represented around [REDACTED] per cent capacity utilization).

Lafarge told us that it was able to sell the RMX made from this GGBS in the UK as the RMX would have the 'CE' mark.<sup>38</sup> It said that it would not be cost-effective for its Spanish GGBS supplier to make GGBS without limestone in it specifically for Lafarge. Lafarge told us that its ability to import GGBS from Spain was largely due to the economic downturn in Spain. It said that, at the moment, there was good availability of cementitious materials.

7.117 Lafarge also told us that the GGBS it imported was used to produce CEM II/III, but that its RMX businesses bought GGBS from Hanson.

*PFA production, sales and market shares*

7.118 Depending on the power station and fuels used, PFA can be used directly in concrete manufacture following classification. However, a high proportion of PFA produced at UK power stations in its raw form cannot be used directly for cementitious applications, because of the high carbon content or other impurities, and requires further processing. The main exception to this is the Drax power station, which produces PFA of sufficient quality that it can be used directly as a cementitious product. Lafarge had an exclusive licensing arrangement with Separation Technologies LLC (owned by Titan Cement Group) for the installation of equipment to produce PFA in the UK and the Republic of Ireland that expired in 2012. The STI technology has been installed at a number of power stations in GB (by Lafarge in JV with power station owners and, in one case, Cemex). Lafarge told us that [REDACTED]. There is also another technology available to produce PFA, Rocktron, which has recently been installed at the Fiddlers Ferry power station in Cheshire (owned by Scottish and Southern Energy), although it was announced in February 2012 that this installation

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<sup>38</sup> Hanson told us that the Construction Products Regulation (EU) 305/2011 of 9 March 2011 made it mandatory from 1 July 2013 for manufacturers to apply CE marking to any product which was covered by a harmonized European standard such as GGBS (which is harmonized by European Standard EN 15167). Hanson said that this would allow Lafarge to use the cheaper imported GGBS from Spain not only for its own production, but also Lafarge would find it easier to resell Spanish 'CE' marked GGBS in the UK.

had been mothballed. Rugeley power station in Staffordshire (owned by International Power) also produces and markets a cementitious grade of PFA. Key suppliers of PFA in Great Britain include E.ON, EDF, Cemex and Lafarge. PFA is also imported from [REDACTED] by Cemex.

7.119 The data available to us on production and sales of PFA was not as complete as the data on GGBS, and there were inconsistencies in some of the information submitted. We set out in Table 7.10 the coal-fired power plants at which we understand cementitious quality PFA is currently being produced,<sup>39</sup> an estimate of the annual production where available, and the identity of the seller/contractual arrangements where known.

TABLE 7.10 PFA sources and capacity

<i>Power plant</i>	<i>Contract</i>	<i>Total PFA capacity</i>
Drax (North Yorkshire)	[REDACTED], [REDACTED] and [REDACTED] each [REDACTED]	Lafarge estimated that Drax could produce up to 1m tonnes of cementitious quality PFA per year
Longannet (Scotland)	Lafarge JV with Scottish Power for the processing and marketing of all PFA	[REDACTED]
West Burton and Cottam (Nottinghamshire)	Lafarge and Cemex JV (ProAsh) for the production of PFA [REDACTED]	[REDACTED]
Aberthaw (South Wales)	Lafarge JV with RWE for processing and marketing of PFA	[REDACTED]
Fiddler's Ferry	SSE contract with Rocktron	This facility is currently mothballed

Source: Internet research, Lafarge, Cemex, Aggregate Industries.

7.120 Views from parties on the availability of PFA are in Appendix 7.6.

7.121 The information available to us did not enable us to estimate market shares for the production and sales of PFA in GB with any accuracy. From the data in Table 7.10, we considered that it was highly likely that most sales of PFA in GB would be through the Majors. Table 7.11 presents the available information on production and imports

<sup>39</sup> We did not include Didcot in this table. We understand that Didcot, though it has capability to make cementitious PFA, is not currently in operation.

of PFA. However, Table 7.11 is incomplete as we did not have information on Drax and Rocktron sales.

TABLE 7.11 **Production and imports of PFA in GB**

	2007	2008	2009	2010	2011
Lafarge	[X]	[X]	[X]	[X]	[X]
Of which, imports of PFA	[X]	[X]	[X]	[X]	[X]
Cemex	[X]	[X]	[X]	[X]	[X]
Of which, imports of PFA	[X]	[X]	[X]	[X]	[X]
Hanson	[X]	[X]	[X]	[X]	[X]
Tarmac	[X]	[X]	[X]	[X]	[X]
Aggregate Industries	[X]	[X]	[X]	[X]	[X]
Drax	Unknown	Unknown	Unknown	Unknown	Unknown
Rocktron	Unknown	Unknown	Unknown	Unknown	Unknown

Source: Lafarge, Cemex, Hanson, Tarmac, Aggregate Industries.

### *Relative size of PFA/GGBS markets*

7.122 The data in Tables 7.8 and 7.11 suggests that the total sales of PFA (around 500 kt a year based on the data available to us) are about a third the size of total sales of GGBS (around 1.4 Mt of total GGBS sales a year in GB). Other estimates of the relative size of GGBS and PFA markets also confirmed that PFA sales were lower than GGBS sales (see Appendix 7.6).

### *Further details of the Hanson/Tarmac GBS/GGBS contract*

7.123 As set out above, in the UK, Tarmac and the GB steel producers (Tata Steel and SSI) have entered agreements whereby Tarmac currently has exclusive rights to produce GBS from each of the three GB steel plants: Tarmac owns the equipment required to water-cool the slag so as to transform it into a cementitious granulate material (GBS). Tarmac then sells GBS to Civil & Marine (Hanson) under an exclusive long-term contract (whereby Tarmac must sell all granulated slag destined for cementitious use in the UK to Hanson, though Hanson is not required to take any minimum volume from Tarmac<sup>40</sup>). Hanson undertakes the drying and grinding to transform the GBS into GGBS. The price paid by Hanson to Tarmac for GBS is

<sup>40</sup> Tarmac or Hanson (at Tarmac's suggestion) may sell any surplus material, but only to an end-user identified by Tarmac who does not intend to grind the granulate in the UK for sale in the domestic cement market.

reviewed [X] and is based on a percentages of Hanson's average [X], subject to a [X]. The [X] is reviewed at the end of every [X] year and is based on a [X] of the price paid for GBS.

7.124 The Hanson/Tarmac contract is a long-term 30-year exclusive supply agreement.

The contract was started in 1999 and therefore has over 15 years remaining to run.

Further background information about involvement of Tarmac and Hanson in the GGBS supply chain are in Appendix 7.6.

7.125 To assess the effects of this exclusivity contract, and whether there may be competitive concerns in relation to the supply of GGBS in GB, we considered:

(a) the efficiencies deriving from the contract; and

(b) the possible competition problems arising from the contract (and more generally regarding the supply of GGBS in GB).

7.126 The only evidence on efficiencies was Hanson's views, which are detailed in

Appendix 7.6. We set out the evidence on possible competition problems in the next subsection. Our assessment of whether the exclusivity contract is a feature of the GB cement markets that gives rise to an AEC is contained in paragraphs 8.288 to 8.292.<sup>41</sup>

#### *GGBS/PFA: possible competition problems*

7.127 The main possible competitive problem linked to the exclusivity [the nature of the contract] is that Hanson has market power in the supply of GGBS in GB, leading to higher prices and/or lower availability of GGBS than would otherwise be the case.

We noted that two other European regulatory authorities had expressed concerns

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<sup>41</sup> Section 131(2)(b) of the Act defines a feature of the relevant market as including 'any conduct (whether or not in the market concerned [ie the relevant market]) of one or more than one person who supplies or acquires goods or services in the market concerned'. Hanson and Tarmac are active in the supply of cement and are also active in the GGBS supply chain in GB. Therefore their conduct in relation to the supply of GGBS can be considered by the CC under its terms of reference of 18 January 2012.

about the supply of GGBS in their jurisdictions, and that arrangements for the supply of GGBS in their jurisdictions had been (prior to the involvement of the relevant authorities) broadly similar in structure to the current arrangements in GB (see Appendix 7.6).

7.128 We analysed trends in Hanson's GGBS sales volumes and prices from 2007 to 2011. We compared the volumes and prices for Hanson's GGBS sales to other Majors with its sales of GGBS to non-Majors.<sup>42</sup> We also looked at how Hanson's GGBS volumes, prices and margins compared with Hanson's cement volumes, prices and margins.

7.129 The results of our analysis are in Appendix 7.6. In summary:

- (a) Hanson's prices for GGBS rose when demand for GGBS fell in 2009.
- (b) A greater proportion of Hanson's GGBS sales are to the other Majors, compared with Hanson's cement sales.
- (c) Hanson's prices for GGBS have risen slightly more than Hanson's prices for bulk cement.
- (d) Hanson's variable margins for GGBS are slightly lower than Hanson's variable margins for cement, but Hanson's overall margins for GGBS are higher than Hanson's overall margins for cement.

7.130 We also found Hanson and Lafarge internal documents (see Appendix 7.6) that noted:

- (a) the competitive advantages that Hanson's position in GGBS conferred on Hanson; and
- (b) the cost disadvantages faced by GGBS imports relative to domestically-produced GGBS.

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<sup>42</sup> Due the large share held by Hanson (88 per cent—see Table 7.9), we have analysed Hanson's prices, volumes and margins.

### *Other aspects of market structure*

7.131 There are a number of other structural factors that may facilitate the sharing of, or access to, information in the GB cement markets, including:

- (a) As noted in paragraph 2.79, the GB producers are vertically integrated and their downstream operations (mainly RMX) purchase cement from other GB producers. This means that each GB producer will have up-to-date information on the prices it pays to, and announced price increases sought by, at least the other GB producers from which it purchases cement. In their capacity as cement customers, the GB producers may also occasionally (or regularly) seek quotes from those cement producers from which they do not currently purchase cement, and may therefore have some information on the prices offered to them by those suppliers as well. We acknowledge that, as prices for cement are agreed following confidential bilateral negotiations, the prices at which such cross-sales are made do not provide precise information on prices paid by other cement customers.
- (b) The GB producers are engaged in JVs with one another (see Appendix 3.1), mainly in relation to their aggregates, RMX and asphalt businesses, though there are also some JVs relating to cement and cementitious products. The presence of JVs between cement producers will increase the amount of interaction between them and provide another forum for communication between them, including repeated opportunities for informal senior level business contacts. Such interactions have the potential to strengthen their relationships and increase their awareness of their mutual interdependence.
- (c) The internal documents that we reviewed as part of our investigation (see paragraphs 8.44 and 8.84) showed that, in the context of cross-sales to one another, and through participation in common business forums (eg CEMBUREAU, the European Cement Association), there are opportunities for senior level business

contacts between the GB producers—and these opportunities are on occasion taken—which have the potential to facilitate transparency in the cement market.<sup>43</sup>

7.132 In the context of assessing transparency in the market, we asked the GB producers what information they held on their competitors. They told us that they were all members of common industry associations, such as the MPA, and, as such, they each provided data on production and sales to the MPA on a monthly basis. The MPA then publishes data on its members' production and sales, including aggregated monthly cement sales and quarterly cementitious and cement sales by channel and region. The GB producers therefore have access to monthly data (one month in arrears) on a significant proportion of cement demand, from which they can calculate their own shares of production and sales on a monthly basis.<sup>44</sup>

7.133 The GB producers also told us about other sources of information regarding their competitors that were available to them—see Appendix 7.3.

7.134 Assessing the extent to which firms' incentives are aligned—through consideration of symmetries between firms—is a factor in assessing the possibility of coordination in a market (see the Guidelines, paragraph 252). We found that there were some symmetries between the GB producers in terms of their cost structures and profit drivers:

(a) Our analysis of the cost structures of the GB producers is set out in Appendix 6.5.

We found that there was a large degree of symmetry in the unit variable costs of the cement divisions of the GB producers. In FY11, for all of the cement-

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<sup>43</sup> Our concern is not that these forums in themselves are aimed at facilitating transparency or anti-competitive activity. Indeed we have seen evidence that some of these forums are highly conscious of the need to avoid such activity, and take steps intended to ensure that it does not take place under the formal auspices of those organizations. Our concern is that, in the margins of such industry gatherings, there are repeated opportunities for informal senior level business contacts.

<sup>44</sup> We also noted that the Department for Business, Innovation and Skills publishes monthly clinker production and cement sales data on its website, as well as an annual price index for cement sales in GB. Further, Lafarge and Cemex (but not Hanson or Tarmac) are part of the UK register for the European Eco-Management and Audit Scheme. As part of this scheme, participants produce a sustainability report, which includes details of cement production by plant and cement sales by depot.

producing Majors, variable costs per tonne sold ranged from £[redacted] to £[redacted], or between [redacted] and [redacted] per cent of total costs.<sup>45</sup> Among the cement producers, [redacted] benefited from the lowest unit variable cost at £[redacted]. Excluding [redacted], the range for the unit variable cost of the remaining three cement producers tightens: from £[redacted] ([redacted]) to £[redacted] ([redacted]).

- (b) Our analysis of the GB producers' consolidated profits (see Appendix 6.5) showed that Cemex, Hanson and Lafarge had similar profit drivers, in the sense that their respective cement divisions made the largest contribution to their consolidated profits (ie the combined EBITDA of their aggregates, cement and RMX divisions), whilst Tarmac's cement division contributed only [redacted] per cent to its consolidated profits<sup>46</sup>.

### **Market outcomes**

7.135 In light of what the Guidelines say on market outcomes that the CC may take into account in its AEC assessment (see paragraph 4.13), in this subsection we look at the following outcomes in the bulk and bagged cement markets in GB to assess the extent of any competition problems (for example, arising from unilateral market power or coordination):

- (a) profitability;
- (b) margins;
- (c) pricing and price dispersion;
- (d) customer switching; and
- (e) month-by-month changes in shares of sales.

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<sup>45</sup> [redacted]

<sup>46</sup> Hanson argued that this contribution was (a) dependent upon the revenues generated from carbon sales (which Hanson told us was inconsistent with our exclusion of carbon revenues when assessing profitability in the form of margins), and (b) distorted by the artificial or notional deemed sales of aggregates into the RMX within Hanson's management accounts, when in fact no such sales had ever taken place in reality as it was the same legal entity. However, we disagreed with Hanson for the reasons set out in Appendix 6.5, paragraph 22.

## *Profitability*

7.136 We applied the profitability framework described in Appendix 4.1 to assess the profitability of the GB producers' cement operations. As set out in Appendix 4.2, we used a figure of 10 per cent as our midpoint estimate of the Majors' weighted average cost of capital. Further information on our methodology<sup>47</sup> and the detailed results of our assessment are in Appendix 7.7. For the reasons set out in paragraph 4.14, we consider that it is appropriate to assess the profitability of the GB producers' cement operations on a stand-alone basis.

7.137 We assess the GB producers' profitability by comparing their ROCE with their cost of capital. In addition to calculating ROCEs using the GB producers' normal basis of preparation, HCA, we also sought to estimate the GB producers' ROCE on an economic, CCA, basis. Here the value placed on the capital employed within cement operations reflected our best estimate of its current value to the business, rather than its historical cost. The principal question to be answered in relation to cement was the value to be placed on existing cement plant and machinery. The GB producers whose profitability we analysed did not agree with all aspects of our profitability assessment. Their concerns included (but were not limited to) how we had estimated the current value of cement assets to their businesses, and the depreciation profile we adopted. The GB producers' comments, and our response to the points they raised, are set out in Appendix 7.7.

7.138 The key results of our analysis are set out in Table 7.12. In this table, we distinguish between profitability based on the continuing costs of supply<sup>48</sup> and profitability reflecting all costs incurred (the latter measure captures items that are temporary and/or unexpected in nature—in this case, carbon credits and impairment losses).

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<sup>47</sup> We needed to tailor certain aspects of the profitability framework set out in Appendix 4.1 for the purpose of assessing cement profitability. These cement-specific methodologies are set out in Appendix 7.7.

<sup>48</sup> An alternative terminology would be economic profits or profits based on economic costs.

Profitability determined on the basis of continuing costs of supply indicates economic profitability.<sup>49</sup> We highlight this measure of profitability in the next three paragraphs and consider it to be the best measure of profitability for our purposes as it governs how prices would be set in a competitive market (see Appendix 4.1, paragraphs 76 to 78), before looking at profitability reflecting all costs incurred during the period of review in the final two paragraphs of this subsection (because this is the measure that reflects firms' actual returns over the review period).

TABLE 7.12 Calculated ROCE for each GB cement producer over the period 2007 to 2011

	Profit/(CCA average) capital employed (%)					Average 2007–2011
	2007	2008	2009	2010	2011	
<i>HCA reflecting all costs incurred</i>						
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
Total	9.7	10.3	8.2	12.5	15.8	11.2
<i>CCA based on continuing costs of supply</i>						
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
<b>Hanson</b>	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
<b>Cemex</b>	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
<b>Tarmac</b>	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
<b>Total</b>	<b>13.2</b>	<b>10.3</b>	<b>11.0</b>	<b>14.7</b>	<b>18.9</b>	<b>13.3</b>
Arising from carbon credits	0.1	2.8	2.5	3.8	2.9	2.3
Arising from impairment losses	3.3	-10.3	-18.2	0.2	6.3	-4.0
Reflecting all costs incurred	<u>16.6</u>	<u>2.7</u>	<u>-4.8</u>	<u>18.7</u>	<u>28.1</u>	<u>11.6</u>

Source: CC analysis based on information supplied by GB cement producers.

7.139 We estimated profitability based on continuing costs of supply across the four GB cement producers and found that, as shown in Table 7.12, it had been in excess of their cost of capital (10 per cent) over the period. However, we considered that the

<sup>49</sup> The Guidelines, paragraph 115.

size of the gap between our estimate of the GB producers' returns and their cost of capital might underestimate the extent of the limitation, if any, in the competitive process over this period,<sup>50</sup> given:

- (a) the severe and persistent economic downturn since 2008;<sup>51</sup> and
- (b) the fact that, when estimating profitability, we had not adjusted for the higher operating costs associated with some older and less well-located plants.

7.140 As shown in Table 7.12, according to our estimates, [Producer 1] and [Producer 2] are the most profitable cement producers in GB, and their profitability based on the continuing costs of supply has been well in excess of their cost of capital over the most recent years of the time period we analysed. Their precise ranking is more difficult to establish confidently because variation in calculated firm profitability may be in part a function of the age of their plants<sup>52</sup> and these two firms are at different ends of the spectrum. [Producer 2] has a [X] whereas [Producer 1] [X] at the beginning of the period of review [X].

7.141 [Producer 3] and [Producer 4] are considerably less profitable based on the continuing costs of supply than the other two producers according to our analysis, although they were both making returns in excess of their cost of capital in the most recent year we analysed. Their lower profitability is to be expected as a result of their higher operating costs, which were not adjusted for in our calculations. In particular, [Producer 3's] profitability appears to have been adversely affected by its decision to operate its [X] plants at [X] less than full capacity. [Producer 4] is the least profitable firm. This is likely to result from [X].

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<sup>50</sup> The Guidelines, [paragraph 118](#).

<sup>51</sup> The Guidelines state in [paragraph 125\(a\)](#) that 'A period of low profitability may occur during the course of a downturn in trading conditions, regardless of the state of competition in the affected market'.

<sup>52</sup> It is not the age of the assets per se which potentially affects profitability, rather it is the divergence between the values we placed on the firms' assets (which in our modelling is solely a function of their age) and reality.

7.142 We note that the firm-specific profitability figures we have derived are likely to be less robust than across-firm averages.<sup>53</sup> Our analysis of CCA profits reflecting all costs incurred showed that three of the four GB producers incurred very significant impairment losses following the slump in demand in 2008.<sup>54</sup> These impairment losses relate to the unexpected diminution in the value of their assets due to the emergence of excess capacity in the sector following the reduction in demand from 2008 onwards (see paragraph 2.53). However, together with income earned from carbon credits, this view of profitability (ie reflecting all costs incurred) showed that the GB producers as a whole earned their cost of capital of around 10 per cent, averaged across the five-year the period (ie averaging across the figures shown in Table 7.12).

7.143 In addition, we note that profitability on all the bases we analysed (ie HCA based on all costs incurred, CCA profitability based on continuing costs of supply and CCA reflecting all costs incurred) exhibits a recovery after the slump in demand, and, in the case of three of the four cement producers, profitability has risen to levels beyond those generated at the outset of the period of review. We were concerned by both the absolute level of profitability across firms and the increasing profitability trend across firms since the demand slump.

### *Margins*

7.144 Appendix 6.4 describes the methodology we used to calculate the profit margins<sup>55</sup> of the GB producers and importers on cement, and to compare these profit margins between firms and over time. Appendices 6.5 and 6.6 set out the results of this analysis in detail.

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<sup>53</sup> This is because the loss in value we ascribe to a further year's use of the firm's assets, which in our modelling is solely a function of their age, may diverge from reality. However, this divergence is more likely to net out across the population of cement plants across GB.

<sup>54</sup> Profitability determined on the basis of continuing costs of supply suffered during 2008 and 2009 as the slump in demand took effect and firms sought to adjust to the new circumstances. Our estimates indicate that profitability on this measure has since recovered. Profitability measured on the basis of all costs incurred also slumped in 2008 and 2009 following the demand shock: firms incurred significant impairment losses arising from the emergence of permanent spare capacity following the reduction in demand. However, since the write-off of spare capacity within our analysis profitability has been restored.

<sup>55</sup> In broad terms, profit margins may be thought of as the difference between a firm's revenues and its costs. More detailed definitions of the margins we calculated are in Appendix 6.4.

7.145 The purpose of our analysis of margins was to explore how margins have performed historically against changes in market demand and cost conditions, and the extent of variation in margin performance between market participants. The purpose of our analysis of margins was not to determine whether margins could be deemed high or excessive. Such analysis forms parts of our profitability assessment, in which ROCE is compared with an appropriate competitive benchmark (see paragraphs 7.136 to 7.143).

7.146 In summary, the results of our profit margin analysis of the GB producers' cement operations over the period 2007 to 2011 were that:

(a) Average cement prices had increased in real terms over this period (by 4 per cent for bulk cement and 7 per cent for bagged cement—see Appendix 7.8). Prices had generally kept pace with, or increased at a faster pace than, unit variable costs, resulting in variable profit margins at the least being successfully maintained over this period against a backdrop of declining market volumes and increasing costs.

(b) Variable profit margins for the GB producers' cement operations remained relatively stable and resilient with margins moving within a relatively tight range. In particular, we found that the impact of the sharp downturn in market demand in FY09<sup>56</sup> did not have a negative impact on the GB producers' variable profit margins (on external sales only), with three of the producers experiencing increases in margins whilst the other producer's margins remained broadly flat on prior year levels.

7.147 As set out in paragraph 7.95, our analysis of the margins of the independent cement importers for which we had data showed that their margins were volatile and had

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<sup>56</sup> Whilst the market downturn began towards the end of FY08, we examined the impact of the downturn from FY09 onwards in our margin analysis, when the full impact of the downturn would have been felt.

declined over time, notwithstanding stable or increasing price trends. The independent importers' EBITDA margins were also significantly lower than the GB producers' EBITDA margins.

### *Pricing and price dispersion*

- 7.148 Cement prices are negotiated with customers, and can depend on a number of factors, including delivery distance, type of cement, size of order and the customer's bargaining power.
- 7.149 The GB producers explained to us how prices for cement were set through negotiations with customers, and the factors that the price eventually agreed would depend on (see Appendix 7.8). This evidence showed that each GB producer would have a large number of pricing points at any given point in time, which could be widely dispersed.
- 7.150 We analysed the extent of dispersion in prices paid by different customers for each GB producer, separately for bulk and bagged cement, based on each GB producer's transaction data (see Appendix 7.8). In the case of bulk cement, we undertook the analysis for (a) all external customers, (b) independent customers only, and (c) other Majors only, both for delivered prices and ex-shipping point prices. We restricted the analysis to bulk CEM I sales for comparability purposes. In the case of bagged cement, we undertook the analysis for independent customers only, for both delivered and ex-shipping point prices. It was not possible to further break down our analysis for bagged cement (eg by type of cement) due to the nature of the transaction data provided to us by the GB producers.
- 7.151 The purpose of our analysis of price dispersion was to:

- (a) assess the feasibility of coordination on prices—in particular, low levels of price dispersion can be consistent with coordination on prices, while coordination on prices will be more difficult to introduce and sustain where price dispersion is higher; and
- (b) further our understanding of how competition takes place in cement—in particular, we wanted to understand whether there was a fixed amount of dispersion, which could indicate that there was a maximum dispersion that producers could sustain before customers realized that others get better terms; and whether we saw evidence of price dispersion increasing in periods where the market was more dynamic in respect of customer switching.

7.152 We found that:

- (a) There was significant variation in the prices of bulk cement charged to different customers, even when we controlled for delivery distance (by looking at ex-shipping point prices). We found that, for the GB producer with the least dispersion in price, there was a range of £[redacted] to £[redacted] per tonne (representing [redacted] to [redacted] per cent of the average price of cement) between its highest and lowest prices over the period Q1 2007 to Q4 2011. For the GB producer with the greatest dispersion in price, there was a range of £[redacted] to £[redacted] per tonne between its highest and lowest price (representing [redacted] to [redacted] per cent of the average price of cement) over the same period.<sup>57</sup>
- (b) In the case of delivered prices of bulk cement to all external customers, price dispersion appeared to have increased over time for [redacted], [redacted] and [redacted], with [redacted] and [redacted] data showing distinct highs in Q1 2009, which was a period of higher switching related to the 2009 internalization of volumes by [redacted] from [redacted]. [redacted] and [redacted] data also showed higher dispersion in 2011, when we observed some

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<sup>57</sup> These figures are based on calculations using the difference in prices paid by 90 per cent of customers ie ignoring the prices paid by the 5 per cent of customers paying the lowest and highest prices to omit any erroneously low or high prices.

changes in [X] and [X] market shares. [X] data also showed higher dispersions in Q1 2009, as well as in Q4 2009. [X] price dispersion showed peaks in Q1 2008 and Q4 2008, and then decreased over subsequent quarters. Results based on ex-shipping point prices to all external customers were broadly similar for [X], [X] and [X].

- (c) In the case of delivered prices of bulk cement to independent customers, price dispersion appeared to have increased over time for [X] and [X], with a distinct high in Q1 2009 in the case of Lafarge, and across most of 2009 in the case of [X]. [X] data did not show an upward nor a downward trend, though we observed higher dispersion in Q1 2009 and Q4 2009. [X] and [X] data also showed higher dispersion in early 2011. [X] data showed higher dispersion in Q1 2008 and Q4 2008, with a downward trend in dispersion over the period 2009 to 2011. Results based on ex-shipping point prices to independent customers were broadly similar for [X], [X] and [X].
- (d) In the case of delivered prices of bulk cement to other Majors, price dispersion was generally lower than that for independent customers. Also, price dispersion in delivered prices to other Majors appeared to have increased over time for [X] and [X], with higher dispersion observed, among other quarters, in Q1 2009. [X] data showed higher dispersion in Q3 2008 to Q1 2009, as well as in Q4 2009 to Q1 2010. [X] data showed a downward trend in dispersion, with a peak in dispersion in Q1 2009. Results based on ex-shipping point prices to other Majors were broadly similar for [X] and [X], while for [X] we no longer observed a peak in dispersion in Q1 2009.
- (e) In the case of bagged cement, there was significant variation in both delivered and ex-shipping point prices charged to different customers, though this might be partly due to product mix (such as type of cement, or size of bag), for which we were not able to control. Trends over time are less likely to be affected by product mix (unless there are large changes in the breakdown of sales of bagged cement

between different types of bagged cement). Our analysis showed that dispersion in [redacted] prices had fallen over the period Q1 2007 to Q4 2011, [redacted] and [redacted] dispersions had increased over the same period, while [redacted] dispersion remained similar in 2007 and 2011. We also found that dispersion tended to increase in Q1 for all GB producers, compared with other quarters, which may be related to price increases (see paragraph 7.171).

7.153 A consequence of this dispersion in prices to individual customers is that cement prices paid by individual customers are not completely transparent to competitors or to other customers, although estimates of cement prices (eg an upper and lower bound) may be possible through information on prices set by cement customers downstream (eg the price of RMX) and also through sales negotiations with existing and potential customers.<sup>58</sup> However, there is considerable transparency on price increases that are sought by cement suppliers. The four GB cement producers (Cemex, Hanson, Lafarge and Tarmac)—and some other cement suppliers in GB—regularly send out generic letters to their customers informing them of cement price increases. Our analysis of these letters is described in paragraphs 7.166 to 7.185.

### *Customer switching*

7.154 Analysing customer switching behaviour (see paragraphs 7.155 to 7.161) and changes in shares (see paragraphs 7.6 to 7.15 and 7.162 to 7.164) is relevant to assessing coordination in the context of the sustainability of coordination and determining how coordination may take place in practice.

7.155 We conducted an analysis of switching by bulk cement customers between 2007 and 2011. Our methodology and results are described in detail in Appendix 7.9. There

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<sup>58</sup> Hanson told us that market intelligence and feedback received from customers was not always reliable. Similarly, Cemex told us that customers were driven by their own agenda and therefore that the feedback from these customers was not always reliable. However, as set out here, we considered that this information could be used to infer estimates of cement prices (eg upper and lower bounds) rather than to precisely determine the prices set by competitors to specific customers.

were two key caveats to our analysis which meant that our analysis might not necessarily capture the full extent of customer switching between cement suppliers:

- (a) The data available to us included delivered sales of bulk cement only, and did not include bagged cement or collected sales.
- (b) We only had data for three cement importers (who collectively accounted for just over half of the cement imported into GB in 2011, excluding volumes imported by Aggregate Industries), so switching from/to all other importers was not taken into account in our analysis.

7.156 We examined:

- (a) patterns in switching over time and across suppliers;
- (b) the relationship between switching and market shares; and
- (c) the relationship between switching and prices.

7.157 We found that the degree of switching varied greatly across suppliers and over time, but we observed overall that:

- (a) The end of 2008 and all of 2009 stand out as periods with relatively high levels of switching, reflecting the 2009 internalization event (see paragraphs 7.204 to 7.212) and all the switching of cross-sales and independent customers that followed.
- (b) Some further internalizations also occurred towards the end of 2010/beginning of 2011, although on a much smaller scale.
- (c) Importers' wins were mainly from the largest three cement suppliers (Lafarge, Hanson, Cemex—'the Top 3'), while the Top 3 were both losing customers to the importers and winning customers from them. This is consistent with an increase in importers' combined market share in the period from 2007 to 2011.

(d) Our analysis of annualized data did not reveal any obvious patterns in the switching among the Top 3 suppliers, such as matching of wins and losses.<sup>59</sup> There was also no consistent pattern in whether switching was greater or smaller than one might expect from market shares.

(e) We observed some correlations of wins and losses among the Top 3 suppliers and, to some extent, Aggregate Industries and Tarmac. These results on patterns in customer wins and losses were consistent with the patterns in month-by-month changes in shares of sales (see paragraphs 7.162 to 7.164).

7.158 With respect to the relationship between switching and prices, we found that:

(a) [REDACTED] of customers that switched achieved lower prices. [REDACTED]

(b) Customers switching in 2007 and 2008 did not achieve price reductions on average, but switching from 2009 onwards resulted in customers paying lower prices after switching on average (although this varied by supplier).

(c) There seemed to be a peak in the price dispersion for some suppliers in periods where switching activity was higher (eg Q1 2009).

7.159 As noted in the previous paragraph, considering the market as a whole, we found that customers who switched had achieved lower prices on average from 2009, whereas this was not the case prior to 2009 (there were some small increases in prices after switching on average). We also noted that the period prior to Q1 2009 was a period with large increases in average prices of cement. Taken together, these two observations indicated that customers who had switched were likely to have experienced lower price increases (prior to 2009) or price reductions (after 2009) compared with customers who did not switch. This suggested to us that switching was likely to be a more effective discipline on price paid by an individual customer than on the average price in the market, and that customers who did not switch were

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<sup>59</sup> However, our analysis did not include switching of bagged cement purchases or changes in GGBS purchases.

not benefiting from the relatively lower prices of those who did, ie there was price discrimination in this market. The fact that there were peaks in the amount of price dispersion in periods where switching activity was higher also suggested that the customers who did not switch were not benefiting from the switching activity of others.

7.160 Hanson noted that our analysis did not take into account the effect of threats to switch on prices (ie customers' threats to switch could mean they achieved lower prices with their existing suppliers). Whilst it was the case that our analysis did not take into account threats to switch, we observed that our analysis of average cement prices to all customers showed that cement prices had generally increased between 2007 and 2011 (with some reductions in 2009 compared with peak levels at the end of 2008). This suggested that customers who did not switch (whether or not they threatened to switch) did not on average achieve large price reductions.<sup>60</sup>

7.161 Some of the Majors provided their own win/loss records to us. We compared this data (in particular, total volumes won/lost from each of the other competitors) with the data we used in our switching analysis, focusing only on bulk cement. We noted that we would not necessarily have expected the volumes (either in absolute terms or in terms of relative proportions) to be the same for a variety of reasons, as set out in Appendix 7.9. However, both data sets indicated similar patterns in the switching behaviour of Lafarge, Hanson and Cemex.

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<sup>60</sup> Hanson provided some examples of large Hanson customers who had threatened to switch and the price changes Hanson had therefore had to make to these customers for the period 2011/12. For customers who threatened to switch in 2011, we analysed the price change for these customers compared with the price they obtained in 2010, and found that one of four customers that threatened to switch had experienced a price increase, one had experienced no change in price, and two had experienced a price reduction, although it was not as large a price reduction as that reported by Hanson.

### *Month-by-month changes in shares of sales*

7.162 To further understand changes in shares of sales over time, we analysed changes in monthly shares of sales from total GB sales of the GB cement producers<sup>61</sup> to assess the volatility of shares and the degree of ‘negative autocorrelation’<sup>62</sup> in changes in own shares of sales. Because of our concerns about possible coordination among the GB producers (see paragraph 4.20), our analysis focused on their shares of sales relative to each other, ie importers were not included.

7.163 Details of our analysis are in Appendix 7.10. We found statistically significant negative correlation coefficients in own share of sales changes for two of the GB cement producers ([X] and [X]). The coefficients for [X] and [X] were negative but were not statistically significant. The coefficients were larger (in absolute value) for [X] and [X], less so for [X] and [X]. This is likely to be due to the fact that the [X] and [X] share has been more stable overall over the period, whereas the [X] share reduced (so that overall reductions in share exceeded overall increases month to month) and the [X] share increased.

7.164 We also calculated the correlation between change in own share in a given month and the total change in own share in the following two months, and this increased the negative correlation except in the case of [X]. The coefficients were statistically significant for the three largest cement producers ([X]) when looking at correlation between change in own share in one month and total change in own share in the following two months, but the coefficient was not statistically significant for [X].

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<sup>61</sup> In other words, we looked at changes in each producer's share of GB cement sales as a proportion of total cement sales made by GB producers.

<sup>62</sup> Negative autocorrelation would be high if a large increase in the share of Producer A relative to other producers in one month was followed by a large reduction in the share of Producer A relative to other producers in the following month(s).

## **Conduct**

7.165 In light of what the Guidelines say on how the CC may take into account conduct of market participants in its AEC assessment (see paragraphs 4.16 and 4.28) and our unilateral market power and coordination theories of harm (see paragraph 4.20), in this subsection we look at the following aspects of firms' conduct in the bulk and bagged cement markets in GB:

- (a) price announcement letters;
- (b) price parallelism;
- (c) cross-sales; and
- (d) a large internalization of cement purchases by one Major in 2009.

### *Price announcement letters*

7.166 We undertook an analysis of the GB producers' price announcement letters as part of our wider analysis of competition in GB cement markets, in particular our coordination theory of harm (see paragraph 4.26). Price increase letters could serve as a focal point for coordination (if it were occurring), or they could be used by the GB cement producers to signal to each other the expected outcome from coordination (ie the level of price or of price increase which is sought in the coordinated outcome). Price announcement letters may also provide information on whether there is a price leader (and the identity of that leader), and which companies may be price followers. It is also relevant to analyse the extent to which the GB cement producers are able to realize announced price increases, as an inability to realize announced price increases may mean that price announcement letters cannot serve as a focal point for any existing or potential coordination.

7.167 Cement suppliers regularly send out letters to their customers to notify them that the supplier in question plans to increase its prices for cement.<sup>63</sup> These letters are usually sent out at least once a year—though in one year (2008) they were sent out more than once—and are usually sent at least one month before the date of the planned increase.<sup>64</sup> In this subsection, we present the available information on the announcement letters sent by the GB cement producers to their customers, and set out our analysis on the extent to which these announcements are translated into increases in realized prices.

7.168 In this subsection we:

- (a) analyse the timing and content of price announcement letters;
- (b) report our findings on whether prices paid by customers increased following a price increase announcement, and, if so, to what extent; and
- (c) examine the dispersion of the realized price increases across customers.

*Timing and content of price announcement letters*

7.169 Appendix 7.11 describes the data that we obtained from the GB cement producers on their price announcement letters for grey cement. We focused our analysis on price increase announcement letters for bulk CEM I because (a) CEM I makes up the majority of the GB producers' sales, as well as being an input into non-CEM I products and (b) the time and resources available for our investigation were limited.

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<sup>63</sup> The GB producers noted that price announcement letters did not always translate into realized price increases, stating that the letters were typically the start of a negotiation with a customer. We assess this in paragraphs 7.179–7.181. In addition, Hanson told us that customers often received volume rebates, which were private and could change from time to time. According to Hanson, such rebates reduced any price transparency provided by price increase letters. We have used prices net of rebates in our analysis.

<sup>64</sup> Although we observe instances where realized prices fall for most GB producers, none of them has sent out any letter which announced a price decrease, or no changes to existing prices. Hanson suggested to us that it would be ill considered and unusual to send letters to confirm price reductions in times of continuing cost inflation. Tarmac noted that decreased prices would be the result of bilateral negotiations rather than announced price reductions. Tarmac also told us that observed reductions in average price could be due to changes in customer or product mix, even though individual prices had not changed.

7.170 Appendix 7.11 summarizes the information we received on announced price increases for bulk CEM I.<sup>65</sup> There is a clear parallelism between the GB cement producers both in terms of the dates for their price increases and in terms of the amounts of their announced increases, although to an extent the similarities between producers in the dates for their price increases could be expected as 1 January increases are standard in many industries.<sup>66</sup>

7.171 Cemex told us that we had not been able to substantiate our claim that there was parallelism in price announcements. It said that eight of the twelve announcements became effective on 1 January, and that, as noted above, such announcements were standard in many industries. We noted that the fact that such announcements were standard in many industries did not prevent them possibly harming competition in the cement industry.

7.172 As well as 1 January price announcements, there are also occasionally mid-year announcements which are particularly notable for the parallelism in the dates of their announcement, the date of increase and the amount of announced increase. In particular, the increase for 1 August 2008 was announced in late June by all the GB producers within days of each other: Both Hanson and Cemex sent their letters out on 25 June, Lafarge sent letters out on 26 June and Tarmac sent letters out on 30 June. The amounts of the announced price increases were also similar, ranging between £3.40 per tonne and £4.00 per tonne, depending on the product.<sup>67</sup>

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<sup>65</sup> We note that most GB producers are customers of each other (see paragraph 7.202) and would therefore receive these price announcement letters directly, in their capacity as cement customers. Lafarge told us that its RMX operations, which buy cement from other GB producers, were separate from its cement operations. Lafarge also told us that only its RMX operations received price announcement letters from other GB producers and that these letters were not systematically passed on to Lafarge's cement operations. We note that internal documents from Lafarge show that price announcement letters from other GB producers have been passed on to Lafarge's cement operations on several occasions.

<sup>66</sup> Hanson told us that in its view there was significant divergence in the timing and amounts of the price increase proposals, as even price increases for the calendar year ahead had been issued weeks or months apart.

<sup>67</sup> Cemex told us that the 2008 increases by each GB producer reflected an effort to protect margins by passing through increased costs to customers, and that the correlation between the magnitudes of announced increases was therefore unsurprising. Hanson told us that the 2008 mid-year announcement was initiated by extraordinary and rapid increases in costs, which had to be recovered before the next year.

7.173 In most cases, once a GB producer had announced price increases for a certain date, the other GB producers also announced similar increases within one or two months. The other partial 'pattern' that emerges is that, in five out of the nine<sup>68</sup> price announcements, Lafarge was the first mover. Hanson often acted second and either Tarmac or Cemex came next. This is not a general rule and there are some exceptions, notably in 2010, when Tarmac and Hanson announced a price increase to become effective in January 2010, and Cemex and Lafarge announced an increase to become effective in March 2010 (although they announced their increases shortly after Hanson and Tarmac announced theirs).

7.174 In many, but not all, instances, Lafarge was the first to announce a price increase, and was then followed by the other GB producers which announced similar increases. While this piece of analysis is only one part of our assessment of competition in the GB cement markets, the observation that Lafarge was often first to announce a price increase, followed by the other GB producers announcing similar increases, seems more consistent with cement suppliers accommodating Lafarge's first move rather than trying to compete strongly on prices to increase volumes to take advantage of Lafarge's price increases.<sup>69</sup> The cement suppliers appear to be signalling that they will try to accommodate the other GB producers' price increases in many cases.<sup>70,71</sup>

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<sup>68</sup> Or five out of eight if we count the 1 January 2010 and 1 March 2010 announced price increases as being part of the same round of announced price increases, as they were announced around the same time.

<sup>69</sup> Cemex told us that there was no price leadership in the market, and that it did not take into account its position in any sequence of announcements. This claim is contradicted by internal documents we obtained from Cemex (see, for example, paragraph 8.61).

<sup>70</sup> Cemex told us that if there were consistent differences across producers as regards price increases, then producers' prices would not move in parallel over time. In particular, Lafarge systematically announcing a smaller increase than other producers would not be consistent with prices moving in parallel. We note that realized prices, to a considerable extent, do move in parallel (see paragraph 7.197). Cemex also told us that the GB producers generally announced different increases, as apparent from Appendix 7.11, Table 1. We note that although increases are not identical across the GB producers, announced price increases tend to be similar in size.

<sup>71</sup> Tarmac told us that it considered that its price announcements represented a competitive opening offer to the market, but were made to existing customers only. Tarmac also told us that an increased sales volume could be achieved by attracting new business through strong price competition, and that customers were able to achieve lower prices through switching. Tarmac stated that it did not accept that price announcements represented signalling and accommodation between the GB producers. Finally, Tarmac said that there were circumstances in which its price increase ambitions based on cost recovery would be constrained by competitors' published announcements.

7.175 The reasons that the GB producers gave us for sending out cement price announcement letters are set out in Appendix 7.11, and include customer requirements for such letters, recovery of forecast cost increases and recovery of actual cost increases previously not recovered (or under-recovered). We note that there may be legitimate reasons for notifying customers of planned or intended price increases. However, this does not preclude them from serving other, anti-competitive purposes at the same time.

7.176 During our investigation, we found some internal documents from the GB producers that discussed price announcement letters and the related strategy (see Appendices 8.2, 8.3 and 8.4). These documents tended to confirm our interpretation of the patterns we found in the GB producers' price announcement letters, as set out in paragraph 7.174.

7.177 Appendix 7.11, Figures 1 and 2, show the nominal and cumulative announced price increases over time for the different suppliers and for the different types of bulk cement, as provided by the GB cement producers. In general, the charts show very similar announced price increases by the different suppliers (by product).

7.178 Cemex made a number of significant changes to its pricing strategy with effect from 1 January 2013. The scope for these changes to disrupt the patterns in price announcements that we observed is unclear.

*Announced versus realized prices*

7.179 We were told by the GB cement producers that they were rarely able to realize fully the price increases announced in price announcement letters—we summarize their submissions on this subject in Appendix 7.11. We analysed the extent to which realized price increases followed price increase announcements. In order to do this,

we calculated the average realized change in customers' prices observed in the transactions data submitted by the GB producers and compared this with the price increases that they announced. We aimed in this way to understand:

- (a) whether the GB cement producers were able to increase prices following a price increase announcement;
- (b) if so, how the realized price increase compared with the announced increase; and
- (c) whether there was a discernible pattern in observed average price changes that was consistent across the GB cement producers.

7.180 All our analysis was undertaken on delivered prices only, as we understand that the increase in price shown in the price announcement letters applied to the delivered price to the customer.<sup>72</sup> We calculated monthly average per tonne prices by dividing each GB cement producer's total amount invoiced from independent customers by the GB cement producer's total quantity delivered to independent customers per month. Invoiced amounts net of rebates were used. Also we focused solely on external sales to independents (for the reasons set out in paragraph 7.190), although for completeness, we present results using all external sales in Appendix 7.11.<sup>73</sup> Data was averaged across product and period.

7.181 The results of our analysis are set out in Appendix 7.11. In summary, our analysis showed that:

- (a) In almost all cases that we analysed, the GB cement producers were able to increase the average price paid by their customers following a price increase announcement.

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<sup>72</sup> Where a customer collects cement directly from the producer, delivered prices are equivalent to ex-works prices, and are included in the analysis. Collected sales are a small proportion of each Major's total sales.

<sup>73</sup> Using all external sales, rather than external sales to independents, did not alter our conclusions.

- (b) For all GB cement producers, price increases were realized more successfully for the multiple price increases in 2008 than in the following years.
- (c) In many cases, the GB producers achieved an average price increase of more than half of the announced price—with Lafarge and Cemex being the most successful in this.
- (d) The GB cement producers were generally not able to realize the full announced price increase. In a small number of examples, the full, or an even greater, price increase was realized. In other cases, there was no increase in realised prices.<sup>74</sup>

7.182 The limitations to our analysis are described in Appendix 7.11.

7.183 The GB cement producers told us that, since prices were negotiated individually with customers, there was dispersion and uncertainty in realized price increases. The GB producers argued that, as a consequence, an announced increase provided no information about individual customers' increases, and dispersion would therefore undermine any coordinating function price increase letters might otherwise have served. In response to these submissions from the GB producers, we analysed the dispersion in realized price increases.

7.184 The methodology and results of our analysis of dispersion in realized price increases are set out in Appendix 7.11. We found that:

- (a) The degree of dispersion varied between announcements rounds. On some occasions, most price increases were close to the announced price increase. On other occasions, customers faced a range of price increases. On other occasions yet, there was little dispersion but increases did not cluster around the announced increase. This suggests that announced price increases do not, on

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<sup>74</sup> Hanson noted that the degree of success in increasing the price in any given round of announcements could well vary across the GB producers.

their own, provide clear information about each individual customer's price increase.

- (b) Announcements made by a single GB cement producer, or a subset of GB cement producers, appeared to be less successful than when all firms made announcements that became effective in the same month. This suggests that all GB cement producers' price increase announcements becoming effective at the same time facilitates price increases.

*Summary: price announcement letters*

7.185 We found that:

- (a) In many, but not all, instances, Lafarge was the first to announce a price increase, and was then followed by the other GB producers which announced similar increases.
- (b) The GB cement producers were generally not able to realize the full announced price increase. However, in many cases, the GB producers achieved an average price increase of more than half of the announced price.
- (c) Announced price increases did not, on their own, provide clear information about each individual customer's price increase. However, all GB cement producers' price increase announcements becoming effective at the same time appeared to facilitate price increases.

*Price parallelism*

7.186 In this subsection, we explore the relationships between the GB cement producers' prices for bulk cement and between the GB cement producers' prices and the prices of cement importers for which data was available. We undertook this analysis to understand the extent of parallelism in prices and the degree to which price announcement letters (see paragraphs 7.166 to 7.185) might be serving as a mechanism that contributes to increased transparency in the magnitude, direction

and timing of price changes. If some or all of the GB producers coordinate, we could expect a high degree of correlation between their prices. This would be particularly the case if the focal point for coordination were prices, or if there were some patterns of price leadership/price following in the industry (eg through price announcement letters). A high degree of correlation between prices would also be consistent with intense competition; for instance, if prices increase in the same way due to common cost shocks.

7.187 The GB producers told us that the reason for their announced price increases over the last few years had been increases in their costs. In particular, we were told by Hanson that it sent general price increase notifications to customers in order to attempt to recover its cost increases (eg energy costs which had risen substantially in recent years). Tarmac told us that, to the extent that there had been any correlation in terms of timing and the magnitude of increases sought in the price letters sent by the different cement producers, this could be explained by the need for GB producers (a) to respond to customer requests for customers' own budgeting/costing purposes and (b) to address their increased input costs (which were common to all producers) annually or, in more exceptional circumstances, as they could no longer continue to be absorbed. Lafarge told us that price increases were driven by a mixture of costs including the price of coal, oil and sea freight costs.

7.188 We noted that it would not be possible to draw conclusions about the effectiveness of competition in the GB cement markets from the results of our price parallelism analysis in isolation.

7.189 We compare:

(a) prices between the GB producers to understand the extent to which their prices may be correlated with each other; and

(b) the GB producers' prices with those of a number of cement importers for whom data was available (Aggregate Industries, [Importer A], [Importer B] and [Importer C]).

#### *Data and methodology*

7.190 Details of how we conducted our analysis are set out in Appendix 7.12, including a description of the data and methodology we used. In particular:

(a) We excluded from this analysis data on bagged cement (since we found bagged cement to be in a separate economic market from bulk cement) and on plant-to-plant transfers of bulk cement (since these did not provide information on the market price for cement).

(b) We focused on delivered prices of bulk CEM I sold to non-Major customers, in order for the prices to be directly comparable across GB producers and importers. This was because:

- (i) CEM I makes up the majority of the GB producers' sales, as well as being an input into non-CEM I products. The cement importers supply only CEM I. Therefore we considered that it was appropriate to look at CEM I separately.
- (ii) Sales to other GB producers and internal sales were excluded from the analysis because internal transfer price may not necessarily reflect market prices.<sup>75</sup> Sales to other GB producers may also not reflect market prices in certain circumstances (see paragraph 7.202).

#### *Correlations between the Majors', and Majors and importers', prices*

7.191 We explored the extent of correlation between the GB producers' quarterly delivered prices for CEM I, and between the GB producers' and importers' quarterly CEM I prices. We also explored the extent of correlation between the GB producers' monthly delivered prices.

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<sup>75</sup> Whilst we did not conclude that cement was being transferred internally at non-market prices, by excluding internal transfers from our analysis, any internal transfers at non-market prices could not affect the results of our analysis.

7.192 The results of these correlation analyses are set out in Appendix 7.12. We found that the correlations between the GB producers' CEM I quarterly prices produce high correlation coefficients,<sup>76</sup> ranging from 87 to 98 per cent. Correlations between the GB producers' and [Importer A's], [Importer B's] and [Importer C's] quarterly prices also produced high correlation coefficients, ranging from 82 to 98 per cent, while correlations between [Importer A's], [Importer B's] and [Importer C's] prices produced correlation coefficients ranging from 92 to 98 per cent. This suggests that the GB producers' and [Importer A's], [Importer B's] and [Importer C's] prices are closely aligned over time. Correlations between Aggregate Industries' prices and the GB producers' prices, and between Aggregate Industries' prices and [Importer A's], [Importer B's] and [Importer C's] prices produce lower correlation coefficients, at 57 to 74 per cent and 53 to 68 per cent respectively.

7.193 When we undertook our correlation analysis using monthly rather than quarterly average CEM I prices for the GB producers, the results remain very similar, with the correlations between the GB producers' CEM I monthly prices ranging from 86 to 97 per cent.

7.194 We see from the charts in Appendix 7.12 that the average quarterly prices for all GB producers and importers displayed an upward trend over the period in question. Therefore, we also calculated correlations between 'detrended' differences in quarterly prices, in order to remove any correlation impacts driven purely by trend. Further details of our methodology for this detrending analysis, and the results of the analysis, are provided in Appendix 7.12.

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<sup>76</sup>A correlation coefficient is a single number that describes the degree of relationship between two variables. Correlation coefficients range between -100 per cent and 100 per cent. The closer the correlation coefficient is to 100 per cent, the more changes in one variable (eg costs) are associated with changes of the same sign in the other variable (eg price). The closer the correlation coefficient is to -100 per cent, then the more changes in one variable are associated with opposite changes in the other variable. It is not unusual for time series (eg prices) to have high (positive) correlation coefficients.

- 7.195 As shown in Appendix 7.12, there is high correlation between Cemex's, Hanson's and Lafarge's quarterly detrended price difference series (ranging between [70–95] per cent), which is independent of trend in the actual price series. The correlations between Tarmac's and other GB producers' detrended price difference series are lower, ranging between [50–60] per cent.<sup>77</sup>
- 7.196 As also shown in Appendix 7.12, the correlations between the GB producers' and importers' quarterly detrended price difference series show greater variation. [Importer A]'s and [Importer B]'s detrended price difference series show higher correlations with Cemex's, Hanson's and Lafarge's detrended price difference series ([70–90 per cent]) , and somewhat lower with Tarmac's detrended price difference series ([40–65 per cent]). [Importer C]'s detrended price difference series, on the other hand, shows lower correlations with all Majors' detrended price difference series, ranging from [25–45] per cent.
- 7.197 We concluded from our analysis of cement price correlations that:
- (a) Price correlation among three GB producers (Cemex, Hanson and Lafarge) has been very high in the period Q1 2007 to Q4 2011, even when controlling for trend.
  - (b) Price correlation between Tarmac and the other GB producers is in line with the correlations for the other GB producers when not controlling for trend but are much lower across the period, when controlling for trend.
  - (c) Price correlation has been high between the GB producers and two importers ([Importer A] and [Importer B]), and lower between the GB producers and [Importer C], in the period Q1 2007 to Q4 2011.

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<sup>77</sup> We note that Tarmac's sales to external customers are relatively low, and that Tarmac told us that it made external sales only where the margin available was high enough to compensate it for having to source additional volumes externally.

## *Cross-sales*

7.198 We analysed the extent to which the Majors bought cement from and sold cement to each other (which we termed 'cross-sales').<sup>78</sup>

7.199 We assessed cross-sales as part of our analysis of the coordination theory of harm for cement. There are several possible ways in which cross-sales may facilitate coordination. The existence of customer/supplier relations between the Majors may facilitate information exchange between the Majors and contribute to increased transparency in prices of cement. Cross-sales may also be a tool used by the Majors to signal to each other, or a mechanism by which the Majors can punish each other. In particular, existence of (non-negligible) cross-sales makes repatriation<sup>79</sup> between the Majors possible. Repatriation can be used, on a smaller scale, as a signal that a deviation from any coordinated outcome has been detected, or, on a larger scale, as a punishment for each of the other Majors with which there are cross-sales relationships, if deviation occurs. Finally, cross-sales could also be used as a tool for side-payments between the Majors.

7.200 We were told by the Majors that there were three main reasons that the Majors purchased cement from each other:

- (a) if a producer of cement had a shortfall of inputs in a particular location—Lafarge told us that these types of cross-sales were usually supplied as a matter of short-term expediency during product shortages in periods of high demand;
- (b) for logistical reasons, where there were transport cost savings to be made, ie when a Major's RMX or other concrete operation was located closer to a competitor's cement plant, it might be cheaper to source from the competitors' plant

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<sup>78</sup> Lafarge told us that it did not consider transactions with other Majors to be cross-sales arrangements or agreements, and that it considered that use of the term 'cross-sale' denoted some form of conditionality between the transactions. Aggregate Industries also told us that it made no cross-sales of cement, where cross-sales were defined as sales dependent upon reciprocal supply. For the purposes of our analysis, we term all sales and purchases between Majors 'cross-sales'.

<sup>79</sup> Repatriation occurs when a cement producer brings cement volumes purchased from another producer back into in-house supply.

rather than from its own plant (or, in the case of Aggregates Industries, its own import terminal); and

(c) when a producer of cement did not have the capacity to self-supply its RMX operations.<sup>80,81</sup>

7.201 We analysed the evidence on cross-sales of cement, and in particular:

- (a) for each of the Majors, which cement suppliers it purchased cement from and sold cement to;
- (b) how cross-sales of cement balanced out between the Majors, and which Majors were net purchasers/net sellers of cement;
- (c) the average prices paid for cement by the Majors to each other, and how this compared with the average prices paid for cement by non-Major customers to the Majors; and
- (d) whether there had been any trends in cross-sales over time.

7.202 The details of our methodology and the results of our analysis are in Appendix 7.13.

We found that:

- (a) the Majors had historically bought and sold significant amounts of cement from each other;
- (b) Cemex, Hanson and Lafarge appeared to be predominantly net sellers of cement, while Tarmac and Aggregate Industries were net buyers across the period 2007 to 2011 (2008 to 2011 in the case of Aggregate Industries);
- (c) there were in some cases significant variations in the prices charged to each Major, with [redacted]; while [redacted] Majors often paid higher prices than non-Majors; and

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<sup>80</sup> Tarmac told us that it was a net buyer of cement as it required more than it could self-supply, and it purchased from other Majors where this led to efficiencies associated with savings on transport costs.

<sup>81</sup> Cemex told us that cross-sales agreements were entered into for rational business reasons including: (a) making up for a shortfall of input in a particular location, (b) in order to save transport costs, and (c) in order to supply a Major's RMX operations.

(d) there had been a shift in the Majors' purchases from each other over the period 2007 to 2011 towards greater self-supply, apart from in areas where logistics implied that purchases from other Majors might be more economical.

7.203 We noted that, as set out in the previous paragraphs, when purchasing cement from other Majors, Majors often paid higher prices than non-Majors. We therefore calculated the 'implied revenue differential' of these prices, ie the difference between the revenue a Major would have received for cross-sales to other Majors had the seller used the prices it charged to its non-Major customers (which we call hypothetical revenue) from its actual revenue for cross-sales to other Majors. The details of our analysis are in Appendix 7.13. We found that the implied revenue differentials were not large and did not display any regular patterns, ie the results of this analysis were not consistent with the use of cross-sales for side payments between the Majors.

#### *Analysis of internalization of cement purchases by Hanson in 2009*

7.204 Our analysis of the patterns in cross-sales of cement between the Majors over time showed that, in early 2009, Hanson switched very large volumes of cement purchases for its downstream businesses from Lafarge to in-house sourcing ('the 2009 internalization event'). We studied this significant change in cross-sale arrangements for the same reasons that we analysed cross-sales more generally (see paragraph 7.199), namely as part of our analysis of the coordination theory of harm.

7.205 In late 2007, Hanson (predominantly an aggregates and RMX/concrete block producer with no cement production) was acquired by Heidelberg (the owner of Castle Cement since 1998), giving Hanson cement production capacity in Great Britain. In early 2009, as a result of this acquisition, Hanson internalized most of its cement purchases. Hanson had previously bought cement from Lafarge (about [X] kt in

2008), and it was by far Lafarge's largest customer in 2008, accounting for [REDACTED] per cent of Lafarge's total sales of cement. In 2009, Hanson's purchases of cement from Lafarge reduced to about [REDACTED] kt.

7.206 However, despite this large switch over a short period of time, the GB cement production shares held by Hanson (formerly Castle) and Lafarge appeared to remain relatively stable in 2009—with the large gain to Hanson from internalization being offset by Hanson losing many external cement sales:

- (a) Lafarge decided to self-supply a large volume of its own cementitious purchases from Hanson in 2009 (around [REDACTED] kt reduction in cementitious purchases from Hanson, of which [REDACTED] kt were cement purchases and [REDACTED] kt were GGBS purchases);
- (b) [two other Majors] reduced their purchases of cement from Hanson and switched some of these purchases to Lafarge in 2009; and
- (c) Hanson also lost to Lafarge (on a net basis) a relatively large volume of cement sales to independent customers (both bulk and bagged) in 2009.

7.207 We asked the Majors for information on the rationale for their switching/internalizing decisions in 2009, as well as copies of their internal documents in relation to these decisions, and for copies of correspondence with customers (in the case of Hanson and Lafarge) and correspondence with other Majors (in the case of Hanson, Lafarge, [and the two other Majors that switched cement purchases to Lafarge in 2009]) at the time of the internalization event.<sup>82</sup> We also interviewed four independent customers who switched at the time.

7.208 Our analysis of the evidence we received on the 2009 internalization event is in Appendix 7.14. We first explored the evidence on Hanson's rationale for

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<sup>82</sup> We did not request any documents from [the remaining Major] as it did not appear to have switched cement purchases from Lafarge to Hanson at the time.

internalization. We then organized the evidence on the relationship between Hanson and Lafarge into a 'timeline' covering the period following the decision to internalize and examined how the relationship subsequently evolved. We next looked at the evidence on Lafarge's response to the internalization event. Finally, we analysed the correspondence between Hanson and Lafarge and the customers who switched between them in 2009, as well as the evidence from our interviews with customers who switched between them in 2009.

7.209 Our analysis of the 2009 internalization event is in Appendix 7.14. Overall, our review of the internal documents, the correspondence between the Majors, and between the Majors and their customers and our discussions with customers suggested that:

- (a) There was a breakdown in the customer/supplier relationship between Hanson and Lafarge in autumn 2008. Hanson communicated to Lafarge its intention to internalize [around one-third] out of the total [X] kt of cement that it was purchasing from Lafarge around September 2008. Lafarge then responded by attempting to renegotiate the terms of supply with Hanson, which included possible increases in prices to Hanson or reductions in rebates to Hanson for 2009 to reflect a reduction in the volumes purchased by Hanson. The failure to come to any agreement on prices resulted in Hanson indicating to Lafarge that it (Hanson) would in January 2009 commence self-supply of all cement purchases from Lafarge, and in January 2009 Hanson internalized all cement purchases from Lafarge. Around February/March 2009, Hanson and Lafarge came to an agreement for Lafarge to start supplying part of Hanson's RMX business again (Hanson RMX and concrete in the South-West), although at much lower volumes than had initially been planned ([around one-quarter] that Hanson had intended to continue purchasing from Lafarge in 2009).
- (b) It appears that Lafarge's answer to Hanson's internalization plans was: first, to try to mitigate the amount internalized and try to influence the location of RMX plants

for which Hanson would continue to rely on Lafarge cement supplies so as to cease supplying the Hanson sites that were least profitable for Lafarge to supply (which were those most expensive to supply because of their distance from Lafarge cement plants). When this failed, our review of Lafarge's internal documents suggested that Lafarge attempted to recover any lost volume from Hanson by targeting Hanson-supplied customers [X].

- (c) Lafarge initially told us that it did not specifically target Hanson customers in its efforts to recoup lost volumes after the 2009 internalization by Hanson, and provided data showing that, in 2009, Lafarge had won customers from all Majors, not just Hanson. However, if we include bagged customers as well as volumes from other Majors, we find that in 2009, following the internalization, a very large proportion of the cement volumes won by Lafarge were of customers previously supplied by Hanson, and the proportion of cement volumes won from Hanson was higher than that implied by market shares. Whilst we accept that, because Hanson accounted for a large proportion of cement sales to independent customers in 2009, it was to some extent inevitable that Lafarge would win large volumes from Hanson in seeking to recoup lost volumes. However, there was clear evidence from the internal documents that Lafarge deliberately targeted Hanson customers during this period and that Lafarge specifically tracked its share against Hanson's while it was attempting to recoup volumes. In addition, Lafarge subsequently told us that its initial reaction to Hanson's internalization was not entirely rational and involved the specific targeting of Hanson customers. Lafarge explained that Hanson was Lafarge's largest customer and also had the largest and easiest customers for Lafarge to target. Lafarge said that Lafarge's apparent targeting of Hanson's customers was because Hanson's independent customers were considering, following Hanson's internalization, whether Hanson remained able to provide the same security of supply as previously. However, there is no evidence in the internal documents of customers expressing concerns

about security of supply if they were to remain with Hanson, nor is there contemporaneous evidence of Lafarge considering this to be a reason for targeting Hanson customers preferentially.

- (d) The internal documentary evidence suggests that Lafarge may have been quite aggressive in its negotiations with some of Hanson's key customers, in particular [REDACTED] and [REDACTED]. The Hanson internal documents suggest that Hanson may not have fully anticipated Lafarge's reaction—Hanson announced some very large price increases for January 2009 (£1.20 more than Lafarge), but was confronted with resistance to this increase from some key customers who had been approached by Lafarge. Around March/April 2009, however, Hanson seemed to be very aware of the situation and appeared to try harder to defend existing business against Lafarge (and even regain some lost customers).
- (e) We also reviewed internal documents relating to the switch by the other Majors [REDACTED]. Hanson negotiated a price to supply cement to [REDACTED] for 2009, and, less than one month after formalizing the offer, Hanson announced an increase of [REDACTED] per cent on the price that had been agreed. [REDACTED], though we note that Hanson subsequently revised the price [REDACTED] to [REDACTED].
- (f) In summary, it appeared that:
- Whilst Lafarge internalized cement purchases from several cement producers, it preferentially internalized its cement purchases from Hanson (ie it internalized all its cement purchases from Hanson, whereas it only partly internalized its other cement purchases).
  - Lafarge appeared to have targeted Hanson's customers (out of proportion to Hanson's share of the market) rather than trying to recover these volumes equally from all its rivals. Specifically targeting Hanson's customers in this way may have been suboptimal for Lafarge, as Lafarge could instead have sought to gain customers—regardless of their existing supplier—which were most profitable for Lafarge to serve (eg customers closest to Lafarge's cement

plants). These events are consistent with Lafarge retaliating against Hanson (and/or Lafarge targeting only Hanson's customers to avoid the risk of retaliation from the other cement producers) with stability of market shares as the goal for Lafarge.

- The average prices for cement charged by both Hanson and Lafarge increased very substantially in early 2009 (and in fact announced price increases across the industry for 2009 were generally very high),<sup>83</sup> although there was some erosion of Hanson's and Lafarge's average prices from around April 2009. By December 2009, Hanson's average prices of CEM I to independents had returned to their level as at the end of 2008, whereas Lafarge's average prices of CEM I to independents had reduced compared with their levels of early 2009, but remained above their levels as at the end of 2008 (see Appendix 7.12). There may therefore be some evidence of a 'price war' between Hanson and Lafarge in 2009, though we note that the impact on prices was only to reduce prices compared with their peak levels of Q1 2009. This may indicate that any price-cutting behaviour can be targeted fairly precisely in the cement industry (ie only those customers targeted by Lafarge benefited from Lafarge's reaction to Hanson's internalization).

7.210 Therefore, the internal documents suggest that late 2008 and early 2009 was a period where the negotiations between Hanson and Lafarge did not succeed, and that Lafarge responded to the internalization by attempting to regain equivalent volumes to those it had lost from Hanson-supplied customers. While we would expect Lafarge to attempt to recoup volumes when it lost a large customer in a competitive market, the fact that Lafarge appears to have targeted Hanson customers (rather than attempting to gain customers from Cemex and Tarmac, for instance) could

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<sup>83</sup> The GB cement producers told us that the high price increases in early 2009 were a consequence of large increases in input costs in 2008.

suggest that Lafarge was either trying to retaliate against Hanson, and/or that stability of market shares in the cement industry was a concern. Targeting specifically Hanson customers may also have been 'sub-optimal' for Lafarge: Lafarge could have sought to gain customers which were most profitable for Lafarge (closest to its plants, for instance), but this does not appear to have been the strategy that Lafarge adopted.

7.211 The internal documents reviewed do not in general suggest that Hanson voluntarily let go of some customers to compensate Lafarge for the loss in volume. Rather, the documents suggest that Lafarge specifically targeted certain Hanson customers and competed harder than it may have done previously with Hanson on prices to gain these customers, though it does appear that Hanson may have underestimated the strength of Lafarge's response to its internalization. The fact that Hanson announced a large price increase for 2009 compared with Lafarge (with a wider gap between their price increases than in previous years) may also have contributed to Lafarge gaining cement customers from Hanson in early 2009.

7.212 The review of the internal documents relating to the 2009 internalization event also shed light on other aspects of our competitive assessment. In particular, these documents suggest that Hanson and Lafarge had a very high awareness of each other's actions (eg who was buying from whom, who was talking to whom) and that they monitored customer switching and information they obtained from customers on the cement prices charged by other Majors. Many documents also suggested that there was a large degree of interdependence in Hanson's and Lafarge's competitive behaviour, ie that they took into account each other's anticipated reaction in taking decisions on pricing. Finally, the documents suggested that maintaining market share was a key objective for Hanson and Lafarge.

## **Impact of market developments**

7.213 We considered the impact on our competitive assessment of the GB cement markets of two key market developments in early 2013 because these developments had the potential to affect competition in these markets and were not otherwise taken into account in our analysis (see paragraphs 4.35 to 4.37). These two market developments were:

- (a) the formation of Lafarge Tarmac as a result of the Anglo–Lafarge JV; and
- (b) the formation of HCM and its entry into the GB cement markets using assets formerly owned by Lafarge.

7.214 Further details regarding the background to these market developments are in Appendix 7.15.

7.215 We examined the impact of these market developments on GB cement market shares. Tables 7.13 and 7.14 below show the total clinker capacity and total clinker capacity shares for GB cement production before and after the creation of Lafarge Tarmac and HCM based on 2011 figures. Lafarge Tarmac total clinker capacity share is lower than that of Lafarge and Tarmac taken together prior to the formation of the JV, because the cement plant that was divested to HCM (Lafarge’s Hope plant) had higher clinker capacity than Tarmac’s Tunstead plant which was taken into Lafarge Tarmac alongside Lafarge’s other cement plants.

TABLE 7.13 **GB clinker capacity and capacity shares 2011**

	<i>Lafarge</i>	<i>Hanson</i>	<i>Cemex</i>	<i>Tarmac*</i>
Total clinker capacity (tonnes)	[ <del>⊗</del> ]	[ <del>⊗</del> ]	[ <del>⊗</del> ]	[ <del>⊗</del> ]
Shares of GB clinker capacity pre-JV (%)	[40–45]	[20–25]	[20–25]	[10–15]

Source: CC.

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\*For Tarmac, this is cement capacity rather than clinker capacity, based on our estimates of achievable capacity rather than nameplate capacity.

TABLE 7.14 Clinker capacity and capacity shares after the formation of Lafarge Tarmac JV and HCM

	<i>Lafarge Tarmac*</i>	<i>Hanson</i>	<i>Cemex</i>	<i>HCM</i>
Total clinker capacity (tonnes)	[ <del>35</del> ]	[ <del>20</del> ]	[ <del>20</del> ]	[ <del>15</del> ]
Share of GB clinker capacity (%)	[35–40]	[20–25]	[20–25]	[15–20]

Source: CC.

\*For Lafarge Tarmac's Tunstead plant, this is cement capacity rather than clinker capacity, based on our estimates of achievable capacity rather than nameplate capacity. This may therefore slightly overestimate the total clinker capacity of Lafarge Tarmac.

7.216 By assuming that the total volumes of cement produced from each plant remain the same after the creation of Lafarge Tarmac and HCM, we were able to estimate possible future market shares for GB cement production. This is shown in Tables 7.15 and 7.16, again based on 2011 figures.

TABLE 7.15 Total production of cement in 2011 and shares of GB production

	<i>Lafarge</i>	<i>Hanson</i>	<i>Cemex</i>	<i>Tarmac</i>
Total cement production pre-JV	[ <del>43</del> ]	[ <del>23</del> ]	[ <del>24</del> ]	[ <del>10</del> ]
Shares of GB production (%)	43	23	24	10

Source: CC.

TABLE 7.16 Total production of cement and shares of production post-JV and MI entry, assuming constant production by plant

	<i>Lafarge Tarmac JV</i>	<i>Hanson</i>	<i>Cemex</i>	<i>HCM</i>
Total cement production post-JV	[ <del>37</del> ]	[ <del>23</del> ]	[ <del>24</del> ]	[ <del>16</del> ]
Shares of GB production (%)	37	23	24	16

Source: CC.

7.217 Following the formation of Lafarge Tarmac and HCM, there was no overall increase in concentration of the UK bulk cement market. There remain four major UK-based cement producers and some competition from imports. If HCM runs the Hope plant at, or near to, its capacity, then market concentration may be expected to decrease on some commonly-used indicators—for example, the three-firm concentration ratio.

7.218 There will be some changes to the vertical structure of two of the four GB cement producers. Compared with Lafarge before the JV, Lafarge Tarmac has a significantly

larger aggregates business (see paragraph 6.112), [X] less cement capacity (because the divested Hope plant is larger than Tarmac's Tunstead plant, albeit the Tunstead plant has greater scope for longer-term expansion than Hope) and a similar sized RMX network (see paragraph 9.63). Compared with Tarmac before the JV, HCM has a much smaller aggregates business (see paragraph 6.112), [X] more cement capacity and a similar-sized RMX network (see paragraph 9.63). Lafarge Tarmac, like Lafarge today, has a significantly lower ratio of cement use to production than Cemex and Hanson. Conversely, HCM has a higher ratio of cement use to production than Cemex and Hanson, though the difference is not as pronounced as for Tarmac pre-JV, in part because HCM operates a larger cement plant than Tarmac did.

7.219 A summary of the views of Majors on the impact of these market developments is in Appendix 7.15.

7.220 As the CC recognized in the Anglo–Lafarge JV report, it is unlikely to be possible to predict the full implications of these recent developments with certainty. The competitive conditions that result from these developments will depend on a variety of factors that are difficult to predict, including the strategies of Lafarge Tarmac, Cemex, Hanson and HCM.

7.221 To inform our consideration of the impact of these two transactions, we reviewed HCM's business plans (see Appendix 7.15). We also developed some possible scenarios as to how Lafarge Tarmac and HCM might decide to compete following their formation. Given the relatively small scale of the aggregates operations of HCM, we concentrated on assessing competition in the supply of cement, rather than aggregates or RMX.

7.222 Looking first at Lafarge Tarmac, we noted that its operations and employees were drawn from both Lafarge and Tarmac, that it had a stronger market position in aggregates than either Lafarge or Tarmac, and that it was likely to seek to exploit some synergies from the combination of Lafarge and Tarmac. However, we also noted that its market positions in cement and RMX were broadly similar to those of Lafarge. Consequently, we expected, at least in the period following its formation, Lafarge Tarmac to follow broadly similar competitive strategies to those pursued by Lafarge up to 2012.<sup>84</sup>

7.223 In relation to HCM, we have no experience of its past competitive behaviour on which to form any expectation of its future strategy. As noted above, we reviewed the initial business plans for HCM, although we were also mindful that these plans might be subject to change in the light of experience as the new company's owners and management developed their view about the strengths and weaknesses of HCM's operations and about their strategic options in the markets in which they participate.

7.224 HCM will be quite similar to Tarmac prior to January 2013, in terms of its market position in cement and RMX, but will have some additional cement capacity and a significantly smaller aggregates business. We considered three possible scenarios for HCM's future behaviour as part of our competitive assessment of the GB cement markets (see paragraph 8.266).

## **Summary**

7.225 In this section, we have described—under the headings of market structure (paragraphs 7.5 to 7.134), outcomes (paragraphs 7.135 to 7.164) and conduct (para-

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<sup>84</sup> Cemex argued that the structure and incentives of Lafarge Tarmac differed from those of Lafarge and Tarmac because its variable costs of production would be substantially reduced compared with those of its predecessors. We noted that Lafarge Tarmac did not itself make this argument. In addition, we considered (as noted) that Lafarge Tarmac's market positions in cement and RMX were broadly similar to those of Lafarge (even though in some cases its assets were different at an individual site level).

graphs 7.165 to 7.212)—the evidence available to us, and the individual pieces of analysis we carried out, as inputs to our assessment of whether there may be features that give rise to one or more AECs in the GB cement markets as a result of unilateral market power or coordination. We also examined the impact of recent developments on these markets, namely the formation of Lafarge Tarmac and HCM (paragraphs 7.213 to 7.224). As well as evidence on market outcomes that was of concern (and that we explore more fully in Section 8), there were individual pieces of evidence and analysis which, when taken in isolation, could be consistent with unilateral market power, coordination and/or competition. In Section 8 we bring together all the evidence and analysis to assess it in the round in order to determine whether there are features giving rise to one or more AECs in these markets through unilateral market power or coordination.

## **8. Cement: competitive assessment**

8.1 In this section, we use the evidence and analysis set out in Section 7 to assess whether there are any features giving rise to one or more AECs in the GB cement markets through unilateral market power or coordination. We first look at evidence and analysis relating directly to the GB cement markets, and then look at the evidence and analysis relating to GGBS.

### ***The GB cement markets***

8.2 We reviewed the evidence in Section 7 on the structure of the cement market, the outcomes of competition in the cement market and the behaviours observed. In this section, we bring together all the evidence and analysis to assess it in the round in order to determine whether there are features giving rise to one or more AECs in the GB cement markets through unilateral market power or coordination.

### ***Market outcomes***

#### ***Overall picture***

8.3 In relation to market outcomes, we found evidence that competition in the GB cement markets was not working effectively, including:

- (a) For the GB cement producers, average prices had increased in real terms between 2007 and 2011 (by 4 per cent for bulk cement and by 7 per cent for bagged cement). Prices had generally kept pace with, or increased at a faster pace than, unit variable costs, resulting in variable profit margins being successfully maintained (and relatively stable) against a backdrop of a 36 per cent decline in demand from 2007 to 2009 (and little recovery in demand since 2009<sup>1</sup>) and increasing costs (see paragraph 7.146). In a well-functioning market, faced with a demand slump, significant excess capacity and high fixed costs, we would

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<sup>1</sup> Demand in 2011 remained 26 per cent lower than it was in 2007 according to MPA figures.

expect significant erosion of margins as market participants competed with each other on price to maintain volumes.<sup>2</sup>

(b) Profitability based on the continuing costs of supply (which we consider to be the best measure of profitability) exceeded the cost of capital<sup>3</sup> throughout the period of review despite the 36 per cent decline in demand from 2007 to 2009 and the fact that this profitability measure was not adjusted for the higher operating costs undoubtedly associated with some older and less well-located plants (see paragraph 7.139). In a well-functioning market, we would expect, as set out in paragraph 116 of the Guidelines, that: 'Firms ... would generally earn no more than a "normal" rate of profit ... ie the rate of return on capital employed for a particular business activity would be equal to the opportunity cost of capital for that activity'. In addition, we note that profitability on all the bases we analysed (ie HCA based on all costs incurred, CCA profitability based on continuing costs of supply and CCA reflecting all costs incurred) exhibited a recovery after the slump in demand, and, in the case of three of the four cement producers, profitability rose after the demand slump to levels beyond those generated at the outset of the period of review. We note that, following the demand slump from 2007 to 2009, demand has yet to recover significantly. In a well-functioning market, we would have expected these ongoing adverse trading conditions to have a continued adverse effect on profitability (even if not necessarily as severe as the initial impact). It was thus both the absolute level of profitability across firms and the increasing profitability trend across firms since the demand slump (including in particular the fact that the profitability of three out of four cement producers had risen to levels

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<sup>2</sup> Hanson argued that under perfect competition, a downturn in demand would not erode margins because prices would already be set at variable cost. However, we do not think perfect competition is the appropriate benchmark against which to assess the effectiveness of competition in the GB cement markets. Our approach is consistent with paragraph 30 of the Guidelines which states that 'the CC uses the term "a well-functioning market" in the sense, generally, of a market without the features causing the AEC, rather than to denote an idealized, perfectly competitive market'. Hanson also argued that standard static models of competition such as Bertrand or Cournot competition predicted that margins would fall more under collusion than under competition and that we had not taken these models into account. We noted first that most models of competition would predict a fall in margins following a demand slump, which we did not observe here. Second, as set out in paragraph 8.3(c), given the degree of excess capacity created by the demand slump, we would expect that, in a competitive market, this would have resulted in significant erosion of margins.

<sup>3</sup> As set out in Appendix 4.2, we used a figure of 10 per cent as our midpoint estimate of the Majors' weighted average cost of capital (WACC).

beyond those at the start of the review period despite the continued adverse trading conditions) that caused us concern.

(c) There had only been small changes in market shares (the most for any Major was four percentage points) over the period 2007 to 2011, despite the 36 per cent decline in demand from 2007 to 2009 (see paragraphs 7.6 to 7.15). In a well-functioning market (see paragraph 4.7) we would expect that, faced with a demand slump, significant excess capacity and high fixed costs, market participants would compete vigorously to maintain volumes which would result in greater volatility in market shares during such a period.<sup>4</sup>

8.4 In addition, we found that customers who did not switch between cement suppliers did not benefit from the relatively lower prices of those customers that did switch—in other words, there was price discrimination (see paragraph 7.159).<sup>5</sup>

#### *Margins and capacity*

8.5 In interpreting the evidence on margins, we noted that there were large changes in both supply of and demand for cement between 2007 and 2011:

(a) as noted above, demand reduced by 36 per cent between 2007 and 2009; it then increased again in 2010 and 2011; and

(b) GB cement production capacity reduced by about 27 per cent between 2007 and 2011.

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<sup>4</sup> Hanson argued that instability in market shares in these circumstances was not a prediction of many economic models, though there were some models where this might be the case (such as the supply function model with asymmetric costs). However, the period of our assessment was a period with very large changes in demand as well as changes in relative efficiencies of the GB cement producers because of various plant closures. We would therefore expect that this would result in large changes in market shares during this period.

<sup>5</sup> Hanson argued that price dispersion was a powerful indicator of whether a market was characterized by competition or coordination, that price dispersion typically increased when there was greater competition in a market and that we should recognize this in the context of the GB cement market. However, price dispersion is not incompatible with coordination, particularly coordination on market shares. We have taken into account changes in the level of price dispersion over time in our assessment of the GB cement markets (see paragraphs 8.223–8.230). We consider that changes in the relative amount of price dispersion over time can be used to indicate more or less competition in a market over the period considered.

- 8.6 The reduction in cement capacity could have protected margins despite the reduction in cement demand if the industry were using the remaining capacity in full following the reduction in capacity (ie if it were capacity constrained). However, this was not the case: there has been sizeable excess production capacity since 2008, particularly in 2008 and 2009 (see Appendix 7.2). Therefore the observed stability in margins cannot be explained only by the fact that supply contracted when demand dropped.
- 8.7 We were told that the main reason for the stability or even increase in variable profit margins in 2009 was that GB cement producers had cut costs in response to the economic downturn. However, we did not see strong evidence that these efficiencies had been competed away and passed on (through lower prices) to cement buyers. In real terms, average bulk and bagged cement prices had increased between 2007 and 2011 (up 4 per cent overall for bulk cement and 7 per cent overall for bagged cement, albeit there were some year-on-year reductions in average prices during the period).
- 8.8 Taken together, the evidence on margins and capacity suggested to us that cement producers did not compete as vigorously as might have been expected when they faced such a significant reduction in demand.

*Three-firm profitability analysis*

- 8.9 Given our concerns about the possibility of coordination in the GB cement markets, we examined the profitability averaged across the three largest cement producers (Cemex, Hanson and Lafarge), and compared the results both with Tarmac on its own and all four GB cement producers in total. We found that, as shown in Table 8.1, the three firms' average profitability based on continuing costs of supply<sup>6</sup> did not

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<sup>6</sup> As previously stated in paragraph 7.139, these results are likely to be an underestimate of continuing profitability due to the downturn in demand, the fact we have not adjusted for the higher operating costs undoubtedly associated with some older and less well-located plant, and the fact that profitability for a single firm, and to a lesser extent for a three-firm average, is likely to

substantially differ from that for all GB cement producers taken together, ie it exceeded the cost of capital throughout the period of review despite the 36 per cent decline in demand from 2007 to 2009. The lack of substantial difference between the three-firm and all-firm profitability figures can be explained by the fact that these three firms continued to produce the great majority of cement in GB despite Tarmac increasing its share in GB production over the period.

8.10 We noted that Lafarge remained the largest producer of cement in GB notwithstanding its effective capacity having reduced the most across all GB cement producers over the period of review (see paragraph 7.18). According to our methodology, [X] profitability is higher than that of [X] and [X] and therefore [X] profitability is the most significant contributor to the overall three-firm average profitability.<sup>7</sup> As noted in paragraph 7.141, the difference between [X] and [X] profitability on one hand, and [X] profitability on the other hand, can be explained by differences in efficiencies between these firms. The fact that per-firm profitability figures are sensitive to the positions of each firm's assets on the assumed depreciation curve may also contribute to these differences.

8.11 Where the three-firm profitability figures (reflecting all costs incurred) differ significantly from those of Tarmac is in the recognition of impairment losses: these were much more significant for Lafarge, Cemex and Hanson as their collective effective capacity requirements reduced whereas the clinker output of Tarmac's single plant grew over the period.

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be less robust than profitability averaged across all four GB producers, the age of whose cement plants are more evenly distributed across the full range of useful life.

<sup>7</sup> Profitability based on continuing costs of supply calculated unadjusted for any higher operating costs and potentially influenced by the age of the firm's individual cement plants, as already explained in the previous footnote.

TABLE 8.1 Sales, production and calculated ROCE figures for GB cement producers over the period 2007 to 2011

	Profit/(CCA average) capital employed						Average 2007–2011
	2006	2007	2008	2009	2010	2011	
<b>Lafarge, Hanson and Cemex</b>							
Cement sales (Mt)	N/A	11.5	9.8	7.0	7.3	7.8	8.7
Clinker production (Mt)	9.4	9.5	8.0	5.7	5.8	6.3	7.1
HCA reflecting all costs incurred (%) CCA		9.3	10.5	7.5	12.0	15.6	10.9
Based on continuing costs of supply (%)		13.3	10.5	10.8	15.1	19.9	13.6
Arising from carbon credits (%)		0.1	2.9	2.5	3.8	3.1	2.4
Arising from impairment losses (%)		<u>2.8</u>	<u>-10.7</u>	<u>-21.3</u>	<u>-1.2</u>	<u>6.8</u>	<u>-5.1</u>
Reflecting all costs incurred (%)		<u>16.2</u>	<u>2.8</u>	<u>-7.9</u>	<u>17.8</u>	<u>29.8</u>	<u>10.8</u>
<b>Tarmac</b>							
Cement sales (Mt)	[x]	[x]	[x]	[x]	[x]	[x]	[x]
Clinker production (Mt)	[x]	[x]	[x]	[x]	[x]	[x]	[x]
HCA reflecting all costs incurred (%) CCA		[x]	[x]	[x]	[x]	[x]	[x]
Based on continuing costs of supply (%)		[x]	[x]	[x]	[x]	[x]	[x]
Arising from carbon credits (%)		[x]	[x]	[x]	[x]	[x]	[x]
Arising from impairment losses (%)		[x]	[x]	[x]	[x]	[x]	[x]
Reflecting all costs incurred (%)		[x]	[x]	[x]	[x]	[x]	[x]
<b>All GB cement producers</b>							
Cement sales (Mt)	N/A	12.3	10.6	7.8	8.1	8.7	9.5
Clinker production (Mt)	10.1	10.2	8.7	6.4	6.6	7.1	7.8
HCA reflecting all costs incurred (%) CCA		9.7	6.0	5.9	5.5	6.2	11.2
Based on continuing costs of supply (%)		13.2	10.3	11.0	14.7	18.9	13.3
Arising from carbon credits (%)		0.1	2.8	2.5	3.8	2.9	2.3
Arising from impairment losses (%)		<u>3.3</u>	<u>-10.3</u>	<u>-18.2</u>	<u>0.2</u>	<u>6.3</u>	<u>-4.0</u>
Reflecting all costs incurred (%)		<u>16.6</u>	<u>2.7</u>	<u>-4.8</u>	<u>18.7</u>	<u>28.1</u>	<u>11.6</u>

Source: CC analysis of information supplied by GB cement producers.

### Possible explanations for market outcomes

8.12 In Section 7, we found that there were individual pieces of evidence and analysis which, when taken in isolation, could be consistent with unilateral market power, co-ordination and/or competition. However, we found evidence from market outcomes (as set out in paragraphs 8.3 and 8.4) that competition in the GB cement markets was not working effectively. We therefore considered unilateral market power or co-ordination as explanations for the market outcomes we observed.

8.13 We note that the distinction between unilateral market power and coordination is not necessarily clear-cut. As set out in paragraph 4.25, the Guidelines explain<sup>8</sup> that the

<sup>8</sup> The Guidelines, paragraph 189.

exercise of unilateral market power is not necessarily linked to the position of a single firm. A market with a small number of suppliers protected by barriers to entry (an oligopoly) may be characterized by significant market power. On the other hand, there is recent economic literature which emphasizes the role of leadership in facilitating coordination.<sup>9,10</sup>

8.14 To assist us in assessing and interpreting the evidence and the results of our analysis, we used a large body of internal documentary evidence which we obtained from the Majors during our investigation. While we treated the documents that we saw as only one element of the overall evidence base, the documents have an important place in our findings in providing direct and contemporaneous evidence of how the Majors have been behaving in the GB cement markets, their strategies and their relationships with each other. Although the scope and nature of the documents differed throughout the period, we had internal documents that spanned a number of years (up to and including 2012) so it was possible to observe behaviour over time. Also the evidence consisted of documents that had not been prepared specifically in contemplation of our investigation, though we were mindful that the later documents were prepared at a time where the market was subject to our review and the DG COMP investigation into the cement sector (see paragraph 1.11).

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<sup>9</sup> Mourariev and Rey (2011) show that price leadership can facilitate coordination when prices are set sequentially rather than simultaneously (Mourariev and Rey, 'Collusion and leadership', *International Journal of Industrial Organisation* 29 (2011); 705–717; this paper also contained a review of European Commission cartel decisions, and found that price leadership featured in 16 out of 49 cases reviewed). Harrington (2012) explores how simple strategies based on price leadership and price matching by followers can lead to an understanding on tacit coordination (Harrington, 'A theory of tacit collusion', Working Paper 588, John Hopkins University, January 2012). Ganslandt, Persson and Vasconcelos (2012) show that a degree of asymmetry in the size of firms can help coordination if there are some costs to coordinating (such as the costs of monitoring and of buying out or otherwise excluding potential entrants), because the leader may be large enough compared with others to have an additional incentive to cover the costs of coordination (Ganslandt, Persson, Vasconcelos, 'Endogenous mergers and collusion in asymmetric market structures', *Economica* 79 (2012); 766–791).

<sup>10</sup> Cemex argued that this literature relied on highly specific assumptions which did not apply to the cement market. While we agree that this literature does not apply directly to the cement market, we also note that academic papers do not generally reflect the circumstances of specific real-life markets, but can nonetheless provide some insights on certain aspects of, and behaviours observed in, real-life markets.

- 8.15 We found that there were examples of documents containing direct evidence of coordination and/or a strategic approach to activity in the market by certain Majors that was aimed at coordinating to achieve market stability.
- 8.16 While the documentary evidence includes documents providing evidence of coordination, it also contains documents providing evidence of some competition taking place, as discussed in our assessment below. The documents providing evidence of coordination are more prevalent in the early period of our review prior to DG COMP's investigation (see paragraph 1.11). The evidence also suggests that the balance between competition and coordination does not appear to be a constant one throughout the period covered. We considered that the changing balance reflects in part changing external conditions, and we discuss each set of documents in more detail in their relevant context below. However, we considered that the existence of a volume of documents which contained evidence of coordinated behaviour in the GB cement markets was significant and was evidence of fundamental shortcomings in the process of rivalry in those markets.
- 8.17 The remainder of our competitive assessment of the GB cement markets is therefore structured as follows:
- (a) We review the internal documentary evidence, and describe the key observations emerging from that review.<sup>11</sup> As noted in paragraph 8.15 above, we consider that these documents contain direct evidence of coordination and/or conduct aimed at achieving coordinated outcomes.
  - (b) We consider in more detail how coordination is taking place in the GB cement markets (ie the 'mechanism for coordination'). In doing so, we examine the

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<sup>11</sup> This review is a synthesis of the evidence in the internal documents—we also draw on this evidence in detail in subsequent parts of our competitive assessment.

susceptibility of these markets to coordination and how the three conditions necessary for coordination to be sustainable in a market<sup>12</sup> are met.

(c) We assess the variation over time in the evidence and the results of our analysis.

(d) We analyse the incentives of market participants to coordinate.

(e) We set out the role that each of the Majors plays in these markets, and we explore the likely effects of the recent formation of Lafarge Tarmac and HCM on the markets.

(f) We assess the effect of coordination on competition in the GB cement markets.

(g) We conclude on whether there are features giving rise to one or more AECs in the GB cement markets.

### *The internal documentary evidence*

8.18 In this subsection, we describe our review of the internal documents we gathered from the Majors during our investigation and what we observed in these documents regarding the behaviour of the Majors in the GB cement markets.

8.19 In the following subsections, we first describe the various categories of document we received and our process for reviewing and evaluating them. Second, we provide some commentary on our general approach to interpreting this evidence. Third, we identify our key observations from each body of documents. In the final subsection, we consider the documentary evidence as a whole.

### *Methodology*

8.20 The internal documents covered in this subsection fall into three categories: first, documents provided by Lafarge, Hanson, Cemex and Aggregate Industries relating to the period up to and including 2008 ('the 2008 documents'); second, strategy and other business planning documentation from the period 2008 to 2011 ('the strategy

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<sup>12</sup> The Guidelines, [paragraph 250](#).

documents’); and third, certain email communications provided by the Majors relating to the period August 2010 to September 2012 (‘the 2012 documents’). We also include some relevant observations from the documents we reviewed in relation to the 2009 internalization by Hanson. Those documents are discussed more fully in Appendix 7.14.

- 8.21 A fuller explanation of the nature of the 2008 documents is in Appendix 8.1. The documents in this category include emails, strategy documents and other business documents. They relate in the main to the period 2002<sup>13</sup> to 2008. The documents do not exclusively cover cement, though our focus has been on those documents relating to cement.
- 8.22 We identified a number of themes from our initial review of the documents and identified particular documents of interest. The originators of the documents had an opportunity to comment on those themes and on their own documents identified in that original review. Further details of our methodology in respect of the 2008 documents are set out in Appendix 8.1.
- 8.23 In order to make best use of the 2008 documents to capture the dynamics in the market over time we also prepared a chronology of events, drawing on key documents, grouping together documents from different sources covering the same event or theme and setting out those documents in broad time order. This is in Appendix 8.2.
- 8.24 We have taken into account in our observations the comments described in paragraph 8.22 and have referred to such comments where material to our observations (although we have not exhaustively set out those comments).

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<sup>13</sup> There are a small number of documents that pre-date 2002 or are undated. There are only a limited number of documents that pre-date 2005.

- 8.25 In paragraphs 8.36 to 8.74 below we describe what we observed from the 2008 documents, taking into account the material outlined in Appendix 8.2.
- 8.26 The strategy documents comprised a range of documentation from the Majors in response to our standard initial document request at the outset of our investigation. These documents related to the Majors' business strategies and business planning. The documents were mainly created during the period 2009<sup>14</sup> to 2011 but some are forward looking.
- 8.27 A fuller explanation of the nature of the 2012 documents is in Appendix 8.1. The documents comprise emails and their attachments relating to the period from August 2010 to September 2012.
- 8.28 As with the 2008 documents, we identified a number of themes from our initial review of the documents and identified particular documents of interest. The originators of the documents had an opportunity to comment on those themes and on their own documents identified in that original review. Further details of our methodology in respect of the 2012 documents are set out in Appendix 8.1.
- 8.29 As with the 2008 documents, we prepared a chronology of events based on the 2012 documents, drawing on key documents, grouping together documents from different sources covering the same event or theme and setting out those documents in broad time order. The chronology, which covers in this case documents from Hanson, Cemex and Lafarge, is in Appendix 8.3. In Appendix 8.4 we include extracts from certain documents of interest from each of Tarmac and Aggregate Industries.

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<sup>14</sup> Some of the Lafarge documents are from 2008.

8.30 We have taken into account in our observations the comments described in paragraph 8.28 and have referred to such comments where material to our observations.

8.31 In paragraphs 8.78 to 8.155 we describe what we observed from the 2012 documents (taking into account the material outlined in Appendices 8.3 and 8.4) and the strategy documents. We deal with these two sets of documents together as the periods covered by each set overlap to a great extent.

*Interpretation of internal documentary evidence*

8.32 The nature of documentary evidence of this kind is that it cannot give a complete view of particular events as it will be supplemented by other forms of communication. We are also aware that the documents we reviewed do not represent a complete set of all documents relevant to activity in the GB cement markets during the relevant periods—there will inevitably be some gaps in the picture emerging from the documents. The evidence is by its nature anecdotal. Therefore, it was important to apply an element of judgement in evaluating what the body of documents as a whole demonstrated about the extent and nature of rivalry within the GB cement market. While in the following discussion we identify particular emails by way of example to illustrate the observations we make from the documents, our assessment of what the documents tell us about rivalry in the GB cement markets does not turn on individual emails; rather it is based on all the documents in the round. We considered that the documents must be interpreted in light of the evidence on market outcomes set out in paragraphs 8.3 and 8.4 that competition in the GB cement markets was not working effectively.

8.33 It was also relevant to consider the specific profiles of companies in the market at the different points in time covered by the documents. In Section 3 we set out information on particular companies active in the GB cement markets, and Appendix 3.2 contains

a timeline of the key mergers and acquisitions affecting the Majors from 1990 to the present day. It was particularly relevant to developing our understanding of the internal documents that during 2000 to 2009 there were a series of acquisitions involving the Majors. Notably, Hanson did not have any GB cement production capability until its acquisition by Heidelberg in 2007.

8.34 Taking into account the qualitative nature of this evidence and the different profiles of GB cement producers over time, we did not anticipate seeing evidence of all GB cement producers engaging in all behaviours of concern continuously throughout the period. We expected that specific events such as the slump in demand from cement from 2007 to 2009 would have an effect on the use and/or frequency of certain behaviours. In particular, we set out in paragraph 8.225 the very significant events in the market immediately preceding and during the period when the strategy documents and the 2012 documents were created.

8.35 The internal documents were only one of several sources of evidence available to us, and, in formulating our views on competition in the GB cement markets, we took into account all the evidence in the round, including the other qualitative and quantitative evidence set out in Section 7.

#### *The 2008 documents*

8.36 The 2008 documents do not represent all documentation relevant to activity in the cement market during the relevant period. Rather, they are a selection of documents that appeared on their face to raise concerns about competition problems in the GB cement markets, [redacted].<sup>15</sup> This does not diminish the value of the documents as a direct record of certain behaviour and interactions between the players in the market. However, we took that important context into account in applying our judgement as to

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<sup>15</sup> See Appendix 8.1, paragraph 3.

what insights the documents gave us into the extent and nature of rivalry in the market. We also considered carefully any context or explanation provided by the parties in relation to their own documents.

8.37 The point was put to us that the documents were 'old' now and therefore, given the significant changes in the market since then, of limited value in the present context. In conducting our investigation into the way in which the market operates, it is important that we do not focus on a snapshot in time but rather look to assess the operation of the market over time. If we were to focus on only a short period of time in making our assessment, the risk would be that specific market conditions prevailing at that time would mean that evidence of market behaviour in that period would not provide an accurate overall picture of how the GB cement market operates generally. However, we also recognized that in evaluating the various categories of document, it is important to consider the prevailing market conditions at the time in which they were generated so that the documents might be properly understood in context. Considered in their context, the 2008 documents remain a valuable source of evidence to be taken into account alongside the other documentary evidence and the other forms of evidence considered in this section in our overall assessment of how the market has been operating over time.

8.38 We note that the documents we reviewed relating to this period did not include any documents provided by Tarmac. The documents provided by the other Majors do make some reference to Tarmac and its activities on the market, though the number of documents that do so are relatively limited. On a number of occasions, other

Majors make reference to what they perceive to be ‘aggressive’ competition or strategies from Tarmac in the market.<sup>16</sup>

8.39 As noted above, during the period covered by the 2008 documents there were a number of acquisitions and consolidations in relation to the UK cement Majors. In Appendix 8.2, we have used the name of the relevant entity and in brackets the name of the Major of which it now forms a part. In the summary below, we have generally considered activity by a Major to include activity by its predecessor companies, where we have relevant information on the relevant predecessor companies.

8.40 We observed from the documents, by way of context, evidence of a number of behaviours which provided insight into how the Majors operate on the market and how they interact with each other. We noted that many of these behaviours were in themselves, at least to some extent, consistent with normal commercial behaviour (for example, some monitoring of own market share may be expected as normal business practice in many industries). However, we analysed these behaviours as part of establishing the backdrop against which other more problematic behaviours (see paragraphs 8.50 to 8.74) were occurring, given that the more problematic behaviours appeared to an extent to be enabled by these ‘backdrop’ behaviours. For example, whilst monitoring of market share and customer gains and losses may be normal practice in many industries, such monitoring also enables ‘tit-for-tat’ retaliation.

- *‘Backdrop’ behaviours*
  - *Monitoring of market share and customer gains/losses*

8.41 The documents of Cemex, Hanson and Lafarge show a close monitoring of own market share (on a number of different or combination of bases including: monthly,

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<sup>16</sup> See, for example, Appendix 8.2, paragraphs 28 & 237.

yearly, in relation to cementitious as a whole, in relation to cement only at a national and regional basis).<sup>17</sup> They also indicate the monitoring of customers and volumes won/lost<sup>18</sup> and that one of the ways in which this information is used is to adjust monthly estimates of market share on an ongoing basis. We noted the level of detail that was collated as part of that monitoring.

◦ *Pricing transparency*

- 8.42 As discussed in Section 7, the Majors routinely issue general price increase announcement letters which set out the proposed increase to be implemented at a specified date (these letters do not specify a specific customer's current price nor what price the customer would pay based on the increase). The documents show that these price announcement letters are received by the RMX division of a Major and there is evidence that the employees in the RMX division have circulated the letter or relayed its contents to colleagues across business lines, including, where relevant, into the company's cement production/sales business line, or that such letters/their content have otherwise come into the possession of cement employees at a rival Major.<sup>19</sup>
- 8.43 Final prices for each customer are agreed through negotiation with the customer. However, the documents also show that sometimes Majors receive information from their customers during discussions/negotiations as to a rival Major's intentions in relation to a price increase<sup>20</sup> or on a rival Major's specific price for that customer.<sup>21</sup> Hanson commented that price increase letters could only provide imprecise, incomplete and often misleading information as they neither showed the actual level of increase achieved (which was negotiated) or the starting price. It also noted that

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<sup>17</sup> See, for example, Appendix 8.2, paragraphs 11, 136, 212 & 261.

<sup>18</sup> See, for example, Appendix 8.2, paragraphs 44 & 45, 54, 136, 154, 261 & 265.

<sup>19</sup> See, for example, Appendix 8.2, paragraphs 176, 245, 247, 248 & 283.

<sup>20</sup> See, for example, Appendix 8.2, paragraphs 174, 215, 243, 252 & 266.

<sup>21</sup> See, for example, Appendix 8.2, paragraphs 202 & 210.

prices agreed in the cross-supply deals between Majors would not give any indication of prices paid by other customers. While we recognize that the pricing information available is not perfect and does not provide systematic information on rivals' pricing at an individual customer level, we consider that the level of pricing transparency in the market reduces uncertainty as to rivals' behaviour in a material way and facilitates coordination (see paragraphs 8.163 and 8.8.179).

◦ *Senior level contact*

8.44 For most of the Majors whose documents we reviewed we observe that there are senior level business contacts between the Majors in the context of cross-sales to one another, and through common business forums (eg CEMBUREAU, the European Cement Association). This contact may facilitate transparency in the cement market.<sup>22</sup> The nature of such contacts is that they are unlikely to be fully recorded in the documentation we reviewed. We are not, therefore, in a position to assess the extent to which, and how, these result in increased transparency. There is evidence which appears consistent with senior officials discussing a future price increase on an occasion. It was reported internally at Lafarge in June 2008 that [Lafarge Senior Cement Executive] had been at the CEMBUREAU conference all week and was very confident that Lafarge would be able to lead a price increase.<sup>23</sup>

◦ *Aggregate Industries*

8.45 The documents show that Aggregate Industries recognized it could leverage its supply options and the potential from imports during this period.<sup>24</sup> Aggregate Industries also recognized at that time its exposure through its lack of vertical

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<sup>22</sup> The MPA said that membership of the MPA was an entirely conventional step for any company in the sector and the MPA delivered all manner of legitimate benefits both for its members and those dealing with them or who are the ultimate beneficiaries of regulatory and/or industrial improvements brought about by its activities. The MPA said that it was very conscious of its responsibility to avoid facilitating any coordination of commercial behaviour. It said that membership of the MPA should not, absent other strong justification, be categorized as something with the potential to harm competition or which facilitates coordination. Our view on the role of common business forums in facilitating coordination is explained in paragraph 7.131.

<sup>23</sup> See Appendix 8.2, paragraph 159.

<sup>24</sup> See Appendix 8.2, paragraph 99.

integration into cement production and was concerned at the imbalance of its purchases from the GB producers versus its sales to the GB producers.<sup>25</sup> Aggregate Industries appears to receive favourable terms from Lafarge.<sup>26</sup>

◦ *Cross-sales*

8.46 For Hanson, Cemex and Lafarge, the documents show that cross-sales of cement are very common during the time period covered by the documents (as noted in paragraph 7.202, the level of cross-sales between the Majors has declined) and provide a high degree of transparency of rivals' production capacity including future intentions, as well as some transparency of rivals' cement pricing. Some links are made in the documents between the price paid for cement from another Major and the price at which cement is sold to that Major (ie an element of reciprocal pricing). One document suggests that acceptance of price increases in the context of cross-sale arrangements can be viewed as a means of signalling between players as to broad intentions on price increases.<sup>27</sup>

8.47 The documents, on their face, suggest some 'efficiency' justifications for cross-sales, ie that cross-sales occur where a rival's cement (or aggregates) plant(s) are located close to the Major's RMX plant(s) such that logistics (haulage) savings may be made by sourcing from the rival's plant(s) rather than self-supplying. It is also clear that

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<sup>25</sup> See Appendix 8.2, paragraphs 97-99, 108, 208 & 209 .

<sup>26</sup> See Appendix 8.2, paragraph 91.

<sup>27</sup> On 17 October 2008, [Cemex Senior Readymix Executive] emailed [Cemex Senior Executive], reporting on a meeting he had had with Lafarge representatives on that date. He notes that Lafarge wanted a price increase of £[§] per tonne for cement supplied to Cemex plants. [Cemex Senior Readymix Executive] had told Lafarge that Cemex would not commit to that price and so it would 'shop around'. However, the email recorded that [Cemex Senior Readymix Executive] considered that there was a 'high probability' of reaching a deal. On the same day, [Cemex Senior Executive] responded to the above email by inserting comments in the text. Following [Cemex Senior Readymix Executive ] comment that Lafarge was seeking £[§] per tonne, [Cemex Senior Executive] stated : 'We take [§] if they take [§]. The more the better for me. I guess they say [§] but are thinking about [§]. Lets just make sure they do not get nervous with us, otherwise all price increases will go bust.' See paragraphs 267 and 268 of Appendix 8.2. Cemex explained that this correspondence was sent in the context of a meeting between Cemex and Lafarge in order to: (a) discuss commercial terms for the supply of cement and other products to Cemex's UK RMX operations; and (b) to explore the possibility of reducing the cost of haulage of cementitious products by reaching a reciprocal supply agreement with Lafarge in order for each party to acquire cement for concrete plants from nearer production facilities from the other party. Cemex told us that the latter proposal sought to reduce transport costs for both concrete businesses. Cemex noted that no agreements were reached in this meeting regarding either of the two issues discussed.

cross-sales allow a degree of leverage in commercial negotiations between the Majors in respect of cement and RMX.

◦ *Role of vertical integration*

8.48 A number of 2008 documents note that the market is highly concentrated and vertically integrated.<sup>28</sup> The documents discuss on a number of occasions that this is the result of efficiencies but reference is also made to vertical integration having a role as a defence against imports.<sup>29</sup> The effect of vertical integration on the operation of the market is shown in the documents in a range of ways, including the opportunity for cross-sales and resulting transparency, plant swap arrangements and the option to use repatriation as ‘retaliation’ (see further below).

8.49 In a Lafarge strategy document for RMX from 2008, the cement market is presented as ‘stable and controlled by the VI players’.<sup>30</sup>

• *Behaviours suggesting shortcomings in competition*

8.50 We also identified from the documents a number of behaviours which together suggested shortcomings in the process of rivalry in the GB cement markets.

◦ *Market share strategy*

8.51 Importantly, we observe that the preservation of market share appears to be a metric of business performance for Hanson,<sup>31</sup> Cemex and Lafarge.<sup>32</sup> In various documents Cemex and Lafarge recognize the importance of maintaining market stability<sup>33</sup> or of ‘balancing’ volume between players. In one example, Lafarge recognized that there

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<sup>28</sup> See, for example, Appendix 8.2, paragraphs 28, 33(a), 99 & 137.

<sup>29</sup> See, for example, Appendix 8.2, paragraphs 22 and 23, 98 & 99.

<sup>30</sup> [X]

<sup>31</sup> As noted in paragraph 8.33, during the period covered by these documents, there were some important acquisitions involving Hanson and its wider group. This observation covers Castle in the period prior to 2007 and Hanson in the period after its acquisition by Heidelberg in 2007 when Castle and Hanson became part of the same group.

<sup>32</sup> See, for example, Appendix 8.2, paragraph 22.

<sup>33</sup> See, for example, Appendix 8.2, paragraphs 12 & 33.

was no point in taking volume from Castle Cement only to have to concede it elsewhere.<sup>34</sup> In another document, Lafarge discussed repatriation by Cemex of cross-sales volume in order to 'balance the books' and expressed frustration that Cemex had not provided compensatory volume it had promised Lafarge due to an earlier repatriation by Cemex.<sup>35</sup> The documents also demonstrate a number of episodes where Cemex appears to be seeking to gain an advantage<sup>36</sup> or is perceived by Lafarge to be behaving in a manner that is not consistent with Lafarge's expectations.<sup>37</sup>

8.52 A 2005 document sets out that Cemex considered that Lafarge 'owed' it value.<sup>38</sup> In September 2005 [Cemex Senior Cement Executive] , emailed [Cemex Cement Employee] and other Cemex employees stating that (emphasis added):<sup>39</sup>

I have spoken with [X] and he has agreed that we should look to take back ALL the volume we are going to lose to Lafarge as a result of the [X] and [X] aggression as soon as possible (ie now, before we lose it)  
...

*Please can you arrange for the outstanding volume to be taken off Lafarge this week and make sure that all parties know why the change is taking place.*<sup>40</sup>

8.53 [Cemex Cement Employee] emailed [Cemex Senior Executive] and explained that the 'main bullets' for Lafarge were that (emphasis added):<sup>41</sup>

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<sup>34</sup> See Appendix 8.2, paragraph 56.

<sup>35</sup> See Appendix 8.2, paragraph 59.

<sup>36</sup> See, for example, Appendix 8.2, paragraph 215.

<sup>37</sup> See, for example, Appendix 8.2, paragraphs 59, 211 & 218.

<sup>38</sup> See Appendix 8.2, paragraphs 40–41.

<sup>39</sup> See Appendix 8.2, paragraph 42.

<sup>40</sup> We understood the reference to taking 'outstanding volume ... off Lafarge' as Cemex intending to retaliate against Lafarge by seeking to recoup volumes which it had lost to Lafarge through loss of particular customers. Moreover, the reference to communicating the reason why this was going to happen to 'all parties' was understood to include Lafarge. We noted Cemex's statement that this was a reference to all Cemex's UK managers that are involved in the production of UK concrete. However, in context we did not consider that this wholly reflected the reference in the email to communication to 'all parties'. This view was confirmed by a subsequent email from [Cemex Cement Employee] to [Cemex Senior Executive] (Cemex) sent on 19 September 2005 discussed in paragraph 8.53.

- We are not looking to increase our market share of Cementitious.
- We see a tonne of ash being the same as a tonne of cement in market share terms.
- *We want cement prices to go up. your market leader and should be the same*, so your actions in cutting our price to [X] by £[X] has not helped.
- *We haven't taken any external volume from you, however if you YET [sic]*. However we don't appreciate your actions [X], [X], and [X], this must stop.
- You are [X], we are [X]. *You should be working with use [sic] to increase the prices of ReadyMix*, your prices to [X] don't help. The price I pay you is the highest I have.

8.54 Prior to the acquisition of Hanson by Heidelberg in 2007, Hanson did not have GB cement production capability. At the time of the Heidelberg acquisition, Castle Cement (a GB cement producer) became part of the same group as Hanson. In the 2008 document set, the earlier documents cover each of Castle Cement and Hanson separately, while the later documents reflect the period following the Heidelberg acquisition when Castle Cement and Hanson were part of the same group. In the following discussion, we set out our observations on the role of each of these players independently prior to the Heidelberg acquisition and then on the combined Castle Cement/Hanson group.

8.55 Before Hanson had GB cement production capability, Hanson and Lafarge had an arrangement described as 'virtual vertical integration' (VVI). This was captured as

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<sup>41</sup> See Appendix 8.2, paragraph 44. Cemex told us that [Cemex Cement Employee] was not in a position to give instructions to [Cemex Senior Executive]. Cemex told us that, according to the information available to it, [Cemex Senior Executive] did not communicate the information and comments contained in this document to Lafarge, nor did he discuss the topics mentioned in this email with Lafarge. We do not characterize this email as instructions, rather we consider that it provides evidence of how key Cemex employees understood Cemex's commercial strategy at that time, even if these particular suggestions were not put into action.

follows 'VVI is effectively in place. If Lafarge Cement UK lose share to our competitors Hanson will replace such volume as is required to balance that share'.<sup>42</sup> A March 2007 document suggests that after the acquisition by Hanson of Civil & Marine, Hanson considered that the model of VVI was no longer entirely appropriate. The document suggests that both Hanson and Lafarge wanted to explore a 'wider VVI model' including GGBS and OPC but recognized the 'problems that might arise concluding such an arrangement'.<sup>43</sup>

8.56 Before the acquisition by Heidelberg of Hanson, the documents show that Castle Cement had an arrangement with Aggregate Industries which involved Aggregate Industries effectively replacing volumes lost by Castle Cement to competing cement suppliers. One of the core conditions of a three-year agreement entered into in 2002 or 2003 was described as follows: 'AI will replace plants lost be [sic] Castle to competing cement suppliers up to the targets volumes at prices to be agreed'.<sup>44</sup> The close nature of the relationship is also suggested in a document from 2006 relating to a UK strategic partnership review.<sup>45</sup>

8.57 The later documents cover the period following Hanson's acquisition by Heidelberg and running up to the internalization by Hanson of a large volume of cement. A focus on maintaining relative market position is demonstrated in a number of documents. For example, in one document from October 2008, [Hanson Senior Cement Executive], emailed [Hanson Senior Cement Executive], in relation to Castle Cement's gains and losses stating (emphasis added):<sup>46</sup>

... could you put together a summary by competitor where we have lost market share

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<sup>42</sup> See Appendix 8.2, paragraph 66.

<sup>43</sup> See Appendix 8.2, paragraph 102.

<sup>44</sup> See Appendix 8.2, paragraphs 6–9.

<sup>45</sup> See Appendix 8.2, paragraph 84.

<sup>46</sup> See Appendix 8.2, paragraph 261.

*We need to track closely gain or loss of share particularly with Lafarge  
as we internalise so that we do not over do things*

I have been working on market share and we may not need to  
internalise as much as we think

I think cement market could fall as low as 9.6,

Therefore 2.4m is 25 per cent

At present our mat share is 22.8 per cent but august share is 21.5 per  
cent so share is dropping fast.

8.58 The subsequent internalization event and related documentation is discussed in detail in Appendix 7.14 and summarized in paragraphs 7.204 to 7.212. We also set out some observations in paragraph 8.76 below from those documents in relation to tit-for-tat behaviour.

◦ *Price stability and price increases*

8.59 The 2008 documents—both emails and strategy documents—show that Lafarge, Cemex and Hanson view the market as being stable. Lafarge as the strongest player appears to identify a leadership role for itself and this is recognized by Cemex and Hanson.<sup>47</sup>

8.60 In a 2005 presentation,<sup>48</sup> Cemex was concerned about the ‘expansion of some aggressive players’ such as Aggregate Industries and Tarmac, and the potential for importers to be ‘a major threat to price stability’. However, one of the actions which Cemex proposed to undertake in response to these concerns, as well as others, was to ‘Set strong discipline in the market to stick to the price increase’.<sup>49</sup> Cemex told us

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<sup>47</sup> See, for example, Appendix 8.2, paragraphs 33, 34, 44, 158, 159 & 172. In relation to Hanson, see Hanson’s comment in the fourth footnote to paragraph 8.62.

<sup>48</sup> See Appendix 8.2, paragraphs 28–29.

<sup>49</sup> See Appendix 8.2, paragraphs 31 & 32.

that the 'market' in this context referred to its customers, although we did not think this was clear on the face of the document.

8.61 The documents described in paragraph 8.60 above, together with a further 2005 presentation described below, indicate that Cemex saw market consolidation, price leadership and signalling, and 'sticking' to the price increase, whilst adhering to respective market shares, as the way in which it could ensure a 'stable' market in which to maximize profit. In the other 2005 presentation,<sup>50</sup> Cemex observed that in the cementitious market there was a 'highly concentrated industry with *stable market positions* ... The Market Leader (Lafarge) with around 35% cementitious market share (42%) ...' Moreover, the price dynamics of that market were described as involving the 'Headline price increase [being] set by market leader'. Cemex explained that this price leadership (emphasis added):

...

*Gives indication of magnitude of price increase and sets tone for price negotiation*

Accepted by independent users

*Nationals negotiate below the headline price*

Bag cement price increase realised used by merchants to limit price increase for bulk cement

Industry trend to pass on supply chain cost reduction to customers

However, recent energy price trend partly basis for 2005 price increase

Major players announced a -£[X]/t headline price increase across the industry for 2005 -£[X]/t realisation in 2005 RMC budget

...

Bulk price follows bag price increase

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<sup>50</sup> See Appendix 8.2, paragraph s 33 & 34.

Bag price increase announced in January, Bulk price increase  
announced in March

*Bag cement price increasingly used as signal to the market of future  
bulk cement price.*

8.62 The documents suggest there is a general understanding of when price announcements will take place. The documents are consistent with signalling between Lafarge, Cemex and Hanson<sup>51</sup> as to what the general magnitude of the price increase will be. This signalling is achieved in a number of ways. The percentage increase is communicated by Lafarge to its customers, including the vertically integrated companies of its competitors. This information is often shared within the rival vertically integrated business. As noted above, there is evidence that, on receipt of the price announcement letters, the RMX division circulates the letter or relays its contents to colleagues across business lines, including, where relevant, into the company's cement production/sales business line. The firms also obtain information from third party customers, sometimes apparently volunteered and sometimes requested, as to rivals' price increase intentions. There is also one example of Lafarge specifically telling Hanson in 2008 of an intended price increase and the amount prior to the Lafarge price increase letter being issued.<sup>52</sup> One document also suggests that acceptance of a rival's price increase in a cross-sales arrangement may be viewed as a signal around approach to increases.<sup>53</sup> There is further evidence that the Majors use and/or interpret price increase letters as a way of signalling pricing behaviour on a Cemex letter to Hanson (annotated by Hanson) dated 25 June 2008, but apparently circulated in early July 2008 in which Cemex announced its bulk products price increases. [Hanson Senior Executive], wrote handwritten comments on the letter

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<sup>51</sup> Hanson became a GB cement producer in 2007, following its acquisition by Heidelberg and its integration with Castle Cement.

<sup>52</sup> See, for example, Appendix 8.2, paragraph s 161 & 166.

<sup>53</sup> See, for example, Appendix 8.2, paragraph 268.

addressed to [X], who we understood to be [Hanson Senior Cement Executive], stating:<sup>54</sup>

I will need your team to toe the line. We should adopt and only you have approval to discount.

However I need to hold as much as possible. We have had 2 clear messages now from Lafarge and Cemex.

8.63 With respect to price increases, there is also evidence that in some instances Majors may have been aware of the intended approach of rivals to price increases in advance of the issuing of price increase letters. In particular, on 13 June 2008, [Lafarge Senior Cement Employee] emailed [X] [Lafarge Senior Cement Executive], copying in another Lafarge employee, informing [X] [Lafarge Senior Cement Executive] that he and the other employee had discussed the proposed price increase to have effect from 1 September 2008 and had concerns about the risks posed by this decision.<sup>55</sup> One of these concerns was that as ‘market leader’ Lafarge would be the subject of negative press coverage. However, [Lafarge Senior Cement Executive] responded stating that he had had a long discussion with [Lafarge Senior Cement Executive] and that (emphasis added): ‘He’s been at *Cembureau* all week, and is *very confident that we will be able to lead an increase*’. Accordingly, based on what he had been told, it would appear that [Lafarge Senior Cement Executive] believed that a price increase could be achieved despite [Lafarge Senior Cement Employee] and the other employee’s concerns.<sup>56</sup>

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<sup>54</sup> See Appendix 8.2, paragraphs 175 & 176. Hanson commented that at that time cost increases were of an unprecedented magnitude and that it took its own decision to review its cement prices. In the days running up to Hanson’s final decision on the relevant price increase, it received, in its capacity as a customer of Lafarge, notice of Lafarge’s intended price increase. It said that although it had already taken its own decision to increase its prices, this market intelligence on Lafarge’s proposed increase effectively constrained the level of Hanson’s increase, since it did not want to lose business by being more expensive than the market leader (see further paragraph 8.164 in relation to the role of price announcements and cross-sales in market transparency).

<sup>55</sup> See Appendix 8.2, paragraph 158.

<sup>56</sup> See Appendix 8.2, paragraph 159.

8.64 There is some evidence that Lafarge, Cemex and Hanson show ‘restraint’ during price increase periods or identify the need to show such restraint from competing. For example, there is a document in which Lafarge recognizes steps taken by [REDACTED] to balance volumes and the need for ‘restraint’ from competition during the price increase period. In an email sent on 16 September 2005, [Lafarge Senior Cement Employee], emailed [Lafarge Senior Cement Executive] with the subject line ‘[REDACTED] losses’ and stated (emphasis added):<sup>57</sup>

... I understand from *our contact that the recent losses in [REDACTED] were implemented as a result of a direct personal instruction from [REDACTED]* (not sure of spelling) to the [REDACTED] Area Director. The latter individual was told that the *move was in response to our approaches to [REDACTED] and [REDACTED]*.

Just to clarify the situation the 2 customers approached us following meetings with [REDACTED] regarding the unplanned price increase in September – both of the individuals concerned were totally disaffected with their existing supplier and as a result they were going to move to imported material.

In view of [REDACTED] response *do we wish to continue targeting the [REDACTED] supplied independent sector – my recommendation is that we should continue to force our competitor into repatriation prior to the Jan 1st price rise and then enter a period of truce whereby we do not disrupt the market increase.*

I am preparing a *further list of targets* in preparation for our meeting on Wednesday.

8.65 In an email sent by [Lafarge Senior Cement Employee], to [Lafarge Senior Cement Executive], on 3 January 2008 [Lafarge Senior Cement Employee] provided an update in relation to the negotiation of that year’s January price increase. With

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<sup>57</sup> See Appendix 8.2, paragraph 46.

respect to Lafarge's competitors, [Lafarge Senior Cement Employee] observed that:  
'All three UK competitors are demonstrating a degree of restraint at the present time,  
and seem to be striving to secure the price increase ...'.<sup>58</sup>

8.66 On 18 June 2008, [Cemex Senior Cement Executive] emailed [Cemex Senior Cement Executive] informing him that [Lafarge Aggregates Employee] had called to tell him that Lafarge's [X] plants would move to in-house supply, ie it would be repatriated/internalized.<sup>59</sup> [Lafarge Aggregates Employee] apparently commented that Lafarge felt that Cemex had been:

... *aggressive* against them in the market. I pointed out to him that year-to-year date they have *taken around [X] of business from us.*

*He also mentioned Lafarge Cement have instructed him that they are to implement a price increase. He asked whether we intend to do similar. I said that we are reviewing our cost base and as a valued customer he would know in good time any intentions on our part (I will report this in [X])*

Following this news I have asked [X] to move the CX mortar plants in [X] to CX Cement supply – Hope this is OK.

8.67 Later that day, [Cemex Senior [Cement] Executive] responded stating that [Cemex Senior Cement Executive] should not to move the mortar plants just yet. [Cemex Senior [Cement] Executive] then forwarded the exchange to [Cemex Senior Executive] (again on the same day) stating (emphasis added):

Fyi...

LF cement moving [X] of volume inhouse.

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<sup>58</sup> See Appendix 8.2, paragraph 117.

<sup>59</sup> See Appendix 8.2, paragraphs 154–155.

*We will keep our powder dry at the moment and focus on increasing prices rather than chasing volumes.*

8.68 There is also some evidence that firms consider they are being undercut by rivals during the price increase periods and that they perceive this as deviation/unacceptable conduct.<sup>60</sup>

◦ *Tit for tat/retaliation*

8.69 There is evidence that action is taken in certain cases to engage in tit-for-tat 'retaliation' where firms have lost a customer to one another. In referring to 'tit-for-tat' retaliation in the context of our internal document review, we are describing the situation where Major A targets the customer of another Major, Major B, on the basis that Major B has won business from Major A or reduced cross-sales from Major A. This behaviour can be used to punish deviation from a coordinated approach or to 're-balance'<sup>61</sup> the volumes of business or market shares enjoyed by the Majors.<sup>62</sup> Punishment for deviation or balancing can also be in the form of repatriating volume in direct response to a competitor gaining one of a firm's external customers. However, it is clear that repatriation is driven in some cases by efficiencies and market conditions. Some of the evidence shows that there is an expectation that other players will retaliate in circumstances where it has 'taken' market share from rivals.<sup>63</sup> In some cases, the reason for the steps firms are taking in repatriating volume or targeting another GB cement producer's customer appear to have been communicated to the rival.<sup>64</sup> We note that during this period the examples in the documents of 'retaliation' relate predominantly to contemplation of action by, or action by, Lafarge.

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<sup>60</sup> See, for example, Appendix 8.2, paragraphs 59 & 218.

<sup>61</sup> We consider that in this kind of document the desire to rebalance market positions can be reflected in references to a range of proxies for share, for example references to tonnage or volumes. We are concerned with the existence of such balancing and not the precise use of terminology in such working level documents.

<sup>62</sup> See, for example, Appendix 8.2, paragraphs 42, 46, 52 & 59.

<sup>63</sup> See, for example, Appendix 8.2, paragraph 136.

<sup>64</sup> See, for example, Appendix 8.2, paragraphs 42 & 154.

- 8.70 At other times, the language used indicates that, if business is taken from a competitor, a concession will have to be made elsewhere and the anticipation of reaction by a competitor is taken into account in considering how to act in the market.
- 8.71 In a 2005 Lafarge internal email, [Lafarge Senior Cement Executive] emailed [Lafarge Senior Cement employee] about ongoing price negotiations with Hanson.<sup>65</sup> [Lafarge Senior Cement Executive] observed that (emphasis added) ‘Hanson offered LCUK the Castle business – they see no value in buying from Castle. I responded that there are no prizes for me to take low price volume away from Castle *only to have to concede it elsewhere*’.
- 8.72 In an internal Lafarge email between [Lafarge Senior Cement Employee] and [Lafarge Senior Cement Executive], a recent gain of a customer previously supplied by Cemex was discussed followed by the observation (emphasis added):<sup>66</sup> ‘If we take this move together with the London Concrete Gerrards X volume *we will have taken c 60kt from Cemex – we must expect retaliation!*’
- 8.73 In a 2008 email, [Lafarge Senior Cement Executive] emailed [Lafarge Senior Cement Executive] to inform him that he had had dinner with [Cemex Senior Readymix Executive] the previous night. He informed him that the (emphasis added):<sup>67</sup>
- General tone of the meeting was OK, however, he commented that Cemex believe that they have lost share in RMX by 4% and in Cement by 2% and that they intend to recover this, which would explain the pricing activity we have seen at Ennstone and now at London Concrete.*
- I commented *only that we have not gained share.*

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<sup>65</sup> See Appendix 8.2, paragraph 56.

<sup>66</sup> See Appendix 8.2, paragraph 135.

<sup>67</sup> See Appendix 8.2, paragraph 136.

2% of Cem I market is circa 240kt. We are ahead against Cemex in Gains and Losses by 20 to 30kt on a straightforward basis, but the performance of their own RMX (80% in-house supplied) plus the general market downturn might cloud their thinking.'

*We need to keep a close watch on our independent customers, for those are now at risk of attack.*

◦ *Imports*

8.74 The documents of each of Lafarge, Hanson and Cemex indicate a close monitoring of importers of cement and the costs of importing and reveal awareness of the potential constraint from increased imports.<sup>68</sup> In one document from 2005, a GB cement producer (Cemex) observes that importers could be a major threat to price stability.<sup>69</sup> The documents show strategic steps being considered or taken by certain GB producers to seek to contain or undermine individual importers or importers generally which would appear to go beyond normal competition on the merits.<sup>70</sup> For example, one GB Cement producer (Cemex) notes in a document prepared for it in association with an external consultant that it would need to verify if it could use its strong position in other countries to limit imports from those countries.<sup>71</sup> We note also that there are a number of examples of acquisitions of importers being considered as a strategic move to reduce the constraint.<sup>72</sup>

*Documents relating to the 2009 internalization by Hanson*

8.75 In late 2008 and early 2009, soon after the period covered by the 2008 documents, Hanson switched very large volumes of cement purchases for its downstream businesses from Lafarge to in-house sourcing ('the 2009 internalization event'). As

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<sup>68</sup> See Appendix 8.2, paragraphs 22–25, 89 & 255–258.

<sup>69</sup> See Appendix 8.2, paragraph 29.

<sup>70</sup> See Appendix 7.5, paragraphs 50, 60-64, 68, 71-73 and 75 and Appendix 8.2, paragraphs 52, 54/55.

<sup>71</sup> See Appendix 8.2, paragraph 33(b). Cemex told us that there was no evidence that the recommendation to leverage Cemex's position in other markets to prevent imports to the UK was ever undertaken. In our view, this document provided direct evidence of a step considered by, and the opportunity available to, Cemex in relation to constraining the threat from importers.

<sup>72</sup> See Appendix 7.5, paragraphs 68 & 72.

part of our study of the 2009 internalization event (see paragraphs 7.204 to 7.212), we obtained documents from Hanson and Lafarge. These consisted mainly of correspondence, both internal and between Hanson and Lafarge, as well as correspondence with other Majors and customers produced in the context of the internalization event between autumn 2008 and spring 2009. We also obtained a limited number of strategy documents produced in the context of the internalization. Our detailed analysis of the 2009 internalization event, and of the documents obtained as part of this analysis, is presented in Appendix 7.14.

8.76 Our review of the documents relating to the 2009 internalization event identified evidence of examples of the tit-for-tat behaviour we also observed in the 2008 documents (see paragraphs 8.69 to 8.73). We identified evidence of Lafarge planning and taking tit-for-tat retaliation against Hanson, as a reaction to the loss of volumes experienced by Lafarge following the internalization by Hanson, as well as evidence of Hanson perceiving itself to be experiencing such tit-for-tat behaviour or anticipating that it would be subject to such tit-for-tat retaliatory behaviour as a result of recent gains it had made. In various documents, Lafarge comments on its options for retaliating against Hanson in response to the internalization and identifies Hanson customers as targets.<sup>73</sup> In various documents produced by Hanson, Hanson perceives its customers at risk of attack or under attack by Lafarge.<sup>74</sup>

8.77 The review of documents also identified evidence on the way in which Lafarge considered tit-for-tat retaliation constrained activity in the market. In a presentation sent by Lafarge's Cement [Senior Employee] to colleagues dated 05/01/2009 and entitled: 'Hanson action: High level- quick thoughts', the following observation was

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<sup>73</sup> See Appendix 7.14, paragraphs 29, 30, 35 & Annex D.

<sup>74</sup> See Appendix 7.14, paragraphs 13, 16 & 18.

made: 'Fear of retaliation to recover volumes usually constrains actions- Do Hanson fear reprisal?'.

*The 2012 documents and the strategy documents*

8.78 We considered that it was important context to our evaluation of these documents that, immediately preceding and during the period when these documents were created, there were some very significant events in the market. In particular: (a) the industry had experienced a significant demand shock in the period from 2007 to 2009 due to the prevailing economic conditions—although there was some recovery in demand subsequently, this was not to pre-2008 levels; (b) Hanson's internalization of large volumes of cement in 2008 had resulted in significant change to long-established trading relationships; (c) Anglo American and Lafarge were pursuing a JV in relation to their UK construction materials operations (including cement); and (d) in January 2012, the cement, aggregates and RMX markets were referred to the CC for investigation and report. We note also, as set out in Appendix 8.1, paragraphs 23 and 30, that Cemex provided only a very limited number of documents, citing its document retention policy.

8.79 In relation to the general 'backdrop' behaviours we identified in the 2008 documents, we also observed those behaviours in the 2012 documents.

- *'Backdrop' behaviours*
  - *Market share monitoring*

8.80 There is a high degree of transparency in relation to cement market shares. Lafarge, Cemex<sup>75</sup> and Hanson report internally on monthly estimates of their own market

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<sup>75</sup> Cemex noted that the time lag in MPA market data did not allow Cemex to track its market share on a real time basis. We note that MPA data is provided one month in arrears and as such the information is available on a sufficiently timely basis to be used in monitoring of market share.

share.<sup>76</sup> There are also examples of estimates being made<sup>77</sup> of competitors' market shares based on various sources.<sup>78</sup> Lafarge, Cemex and Hanson monitor gains and losses and<sup>79</sup> use their own gains/loss information as a source in preparing their market share estimates.

8.81 The strategy documents of Cemex, Hanson and Lafarge also show monitoring of market share:

- Cemex monitors market shares based on volumes of each Major and importers.
- The Lafarge annual strategy reviews assess Lafarge's performance in cement on a national and regional (North, Midlands, South) basis, and show market shares of each Major and importers as a group over time on a national basis, as well as market shares of each Major and importers as a group on a regional basis for the previous year.

8.82 In a number of Hanson documents, sales (volume of cement) and market shares (based on volume sold by Majors and importers) are presented at GB level, with some limited regional analysis. In some documents Hanson presents both overall market share for cement (ie including importers) and the market share of Hanson for domestically-produced cement excluding Tarmac (ie Hanson share in relation to Lafarge and Cemex only). Hanson also monitors its market share of all cementitious products. The documents show that Hanson has high awareness of cement competitors' costs and capacity, sales and market shares. There seems also to be good

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<sup>76</sup> See, for example, Cemex 'Cement Commercial Updates' in Appendix 8.3, paragraphs 324, 358, 363, 277 & 278. See, for example, Appendix 8.3, paragraphs 38, 44 & 394/395, in relation to Hanson and Appendix 8.3, paragraph 357, in relation to Lafarge.

<sup>77</sup> See, for example, Appendix 8.3, paragraphs 197, 331 & 393.

<sup>78</sup> Cemex said that its own market share estimates were drawn from extremely imprecise data, including monitoring gains and losses and interaction with customers. Cemex argued that the degree of uncertainty inherent in such imprecise methods for monitoring market shares meant that Cemex was not able to track market shares of its competitors with a reliable level of accuracy. Hanson said that its data was reliant on customer feedback which could be imprecise. However, we set out in paragraphs 8.165–8.170 how we believe that the terms of coordination in the GB cement market can be monitored.

<sup>79</sup> See, for example, Cemex 'Cement Commercial Updates' in Appendix 8.3, paragraphs 324, 358 & 363. See, for example, Appendix 8.3, paragraphs 209, 284/5, 294/295 & 396, in relation to Hanson and paragraph 103 in relation to Lafarge.

knowledge of the split of each competitor's cement sales between internal and external sales.

- *Pricing transparency*

8.83 We observed a degree of transparency in relation to cement prices. Information on prices is gathered through discussion/negotiations with customers.<sup>80</sup> Independent customers appear to be able to create a degree of competitive tension by playing off other suppliers (other GB cement producers and importers) against the relevant GB cement producer. This in turn gives the GB cement producer a degree<sup>81</sup> of transparency into rivals' pricing. Information is also gathered through the fact that cement producers are either customers or suppliers of each other. Price increase letters also appear to provide some visibility<sup>82</sup> into competitors' pricing aspirations.<sup>83</sup>

- *Senior level contact*

8.84 We continue to observe the existence of informal contact between senior personnel at Majors (eg corporate hospitality and through trade associations).

- *Cross-sales*

8.85 The level of cross-sales is less significant than during the period covered by the 2008 documents but continues to provide a degree of transparency.

- *Aggregate Industries' relationship with Lafarge*

8.86 The documents suggest that Aggregate Industries gets a favourable deal from Lafarge and that Aggregate Industries uses the threat of importing as leverage.

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<sup>80</sup> See, for example, Appendix 8.3, paragraphs 170, 172, 200, 236 & 245.

<sup>81</sup> Cemex stated that information from customers was largely unreliable, as customers were driven by their own agenda and often would misreport. Lafarge Tarmac also said that customer information was not fully reliable and that such information was customer specific, ie it did not give an indication of the price at which the competitor might be willing to supply other locations or more generally. Hanson said that such information was by its nature unreliable as customers were likely to have their own interests at heart. In our view, as set out in paragraphs 8.162 to 8.164, customer information is only one element contributing to transparency in the GB cement markets.

<sup>82</sup> See, for example, Appendix 8.3, paragraph 246.

<sup>83</sup> Hanson said that it might take many months for Hanson to understand what impact such letters might have had on pricing. Our views on the role of price announcement letters in facilitating coordination are set out in paragraph 8.164.

Lafarge considers the favourable arrangement with Aggregate Industries as ‘in lieu of imports’.<sup>84</sup>

- *Vertical integration*

8.87 A number of the strategy documents of the Majors refer to vertical integration and its role in the sector. The annual Lafarge strategy reviews mention that Lafarge is the ‘odd man out’ in terms of vertical integration, that it needs to increase vertical integration (as competitors are more vertically integrated) and get a national footprint in RMX.<sup>85</sup> It is also noted in a document from 2008 that low vertical integration resulted from a desire to maintain leverage purchases (which we understood to be purchases of cement from other producers that could be used in bargaining) over other vertically integrated players.<sup>86</sup> Cemex documents suggest that vertical integration is a way to maximize asset performance and is a ‘Key driver for competitors’ in the RMX market.<sup>87</sup>

- *Behaviours suggesting shortcomings in competition*

8.88 In relation to the behaviours of concern identified in the 2008 documents (see paragraphs 8.50 to 8.74), we made the following observations in relation to the 2012 documents and the strategy documents.

- *Market share strategy*

8.89 We made the following observations from the 2012 documents and strategy documents for each of Lafarge, Cemex and Hanson in relation to their market share strategies for the relevant period.

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<sup>84</sup> See Appendix 8.3, paragraph 258.

<sup>85</sup> [REDACTED]

<sup>86</sup> [REDACTED]

<sup>87</sup> [REDACTED]

◦ *Lafarge*

8.90 A number of Lafarge's strategy documents for the period 2009/10<sup>88</sup> state that its objective is to return to its pre-recession 2007 market share level. In the documents, Lafarge notes that the move by Lafarge's main GB competitors (Tarmac, Cemex and Hanson) to self-supply had resulted in a decline in Lafarge's GB grey cement market share from about 42 per cent in 2007 to around 36 per cent in 2009. In a 2010 strategy document,<sup>89</sup> Lafarge states that, as a result, 'the primary target for LCUK is to rebalance the impact of competitor VI actions and ensure GB market share is regained'.

8.91 In the context of a presentation<sup>90</sup> discussing the ways in which Lafarge could achieve a return to its 2007 market share level, Lafarge stated that (emphasis added): 'From a cement perspective, displacement of an import cement supply is most attractive to help avoid *any likely zero sum volume outcome associated with displacement of another major*'. We noted that Lafarge appears to envisage a 'zero sum' outcome if the volume it 'gained' was from another Major, ie if Lafarge won business from one of the other Majors. This reflects our observations in relation to tit-for-tat retaliation discussed above in 8.69 to 8.73 and below in 8.115 to 8.139.

8.92 We noted that in the 2012 documents one of Lafarge's competitors considered that Lafarge was attempting to grow share in an attempt to enhance its market position ahead of the JV with Tarmac.<sup>91</sup>

8.93 Lafarge Tarmac said that given the extent of the current market downturn, it was natural that the focus of Lafarge in recent years had been to maintain volume rather than to grow market share. It said that market share was considered internally as one

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<sup>88</sup> [REDACTED]

<sup>89</sup> [REDACTED]

<sup>90</sup> [REDACTED]

<sup>91</sup> See Appendix 8.3, paragraph 203.

measure of business performance. According to Lafarge Tarmac, it was by no means the only or the predominant measure. Lafarge Tarmac said that its strategic and aggressive focus in recent years on cost reduction in an effort to maintain business performance had to be fully considered. Lafarge Tarmac argued that it was hardly surprising that producers had not sought to grow market share at a time when their focus had been on 'keeping their heads above the water'. It was not commercially realistic to assume that producers should be striving to grow market share in the depths of a recession when their clear strategic focus has been on cost reduction in order to maintain business performance.

8.94 Lafarge Tarmac also pointed out that a number of Lafarge's internal documents referred to the need to drive its market share back up to 2007 levels, ie up to around 42 per cent from around an actual share of 37 per cent in 2009 onwards. Lafarge Tarmac also said that it used volume and market share interchangeably.

◦ *Cemex*

8.95 As discussed in paragraph 8.78, we had limited internal documents from Cemex to consider for the 2009 to 2012 period because of its document retention policy.

8.96 Cemex's strategy documents did not suggest that Cemex was aggressively pursuing market share. Its strategy seemed to be most concerned with improving profitability via, for example, rationalization, optimizing vertical integration, pricing strategies, cost cutting, footprint, logistics, focusing on more profitable customer segments or product types.

8.97 In a 2010 business plan,<sup>92</sup> it commented in relation to Cement that its commercial strategy was ‘Price based on product, proximity to competitor, technical requirements and trading history’. It stated that it was ‘CX strategy to push bulk blended cements & maintain high margin bag sales (including the introduction of plastic packaged cement’. Similar statements are made in a 2009 business plan<sup>93</sup> and a 2011 forward-looking plan.<sup>94</sup> It also commented in its 2010 business plan that there was a ‘Lack of leadership’ in cement.

8.98 We also noted that in an email sent by [Cemex Senior Cement Executive] to [Cemex Senior Cement Executive], [Cemex Senior Cement Executive] stated that (emphasis added): ‘[REDACTED]’.<sup>95</sup> [Cemex Senior Cement Executive] replied stating: [REDACTED] [Emphasis added].<sup>96</sup> Cemex commented that this exchange showed that there was a debate between [Cemex Senior Cement Executive] and [Cemex Senior Cement Executive] as to whether to maintain market share or reduce prices. In this scenario it had decided to maintain current prices but it said that the fact that there was a debate on the point demonstrated that this was not a consistent strategy to maintain rather than grow share.

8.99 More generally, Cemex said that in some scenarios it may be difficult for it to grow share and hence steps were taken to consolidate share it had fought to obtain, but even then market share was only one factor taken into account in its commercial decisions. However, in other scenarios it was competing hard not only to win new customers but to grow market share. It referred to a number of documents showing examples of competition between Majors and between Majors and independents and said that this suggested that the Majors were attempting to grow share. It quoted one

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<sup>92</sup> [REDACTED]

<sup>93</sup> [REDACTED]

<sup>94</sup> [REDACTED]

<sup>95</sup> See Appendix 8.3, paragraph 368.

<sup>96</sup> See Appendix 8.3, paragraph 369.

weekly Cemex report that referred to it targeting external gains and that the team was working to increase market share.<sup>97</sup> It also referred to the fact that it had a market share target which had often not been met in the recent past and that as such it was during most periods trying to increase share to meet the target.

8.100 We reviewed the internal weekly reports which were available to us (which relate to the period of March to September 2012). The smallest market share identified by Cemex in those reports was calculated to be 21.0 per cent and the largest actual was 22.5 per cent. Market share appeared to be calculated on a monthly basis despite the reports being produced on a weekly basis. The market share target identified by the reports we reviewed was [20–25] to [20–25] per cent, and this did not alter across the period covered by the reports available to us.

8.101 A Hanson internal email commented on Cemex’s position in the market. In an email dated May 2011, [Hanson Senior Executive] commented that:

Cemex is outperforming across the board but they were underperforming across the board last year, so suggest that some of the gains come from a lower starting point than if they had performed with the market last year. Since they underperformed, it is likely they are going to push to get this back in 2011.<sup>98</sup>

◦ *Hanson*

8.102 Both the 2012 documents and the strategy documents show that at times during this period one of Hanson’s goals was to ‘recoup’ lost market share.<sup>99</sup> There is some evidence from the 2012 documents which suggests that Hanson’s market share

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<sup>97</sup> In the report it was said: ‘External gains continue to be our target and team working to increase our market share position’.

<sup>98</sup> See Appendix 8.3, paragraph 203.

<sup>99</sup> See, for example, [3<]. This document refers to business being gained and acknowledges that more is required to achieve market share increases. In the context this appears to be following a loss in volume. It identified a number of reasons for the decline in market share, the combined effect of which was said to be an impact of ‘1 – 2%% share’, and concluded ‘Circa 100K tonnes (c1%) additional volume required asap’.

objective was to achieve its 2008 market share.<sup>100</sup> Hanson appears to have intended to increase its packed cement market share but not its bulk cement market share.<sup>101</sup>

8.103 In relation to the document setting out the target of achieving its 2008 market share,<sup>102</sup> Hanson said that it was evidence of Hanson working to grow its market share from 20 per cent to something close to the 2008 levels of 23 per cent. It said that the figure of 23 per cent was a high-level aspiration in order to push its bulk sales team to make greater sales. It told us that it did not believe that it had matched this figure despite pursuing market share growth. It said that, while the CC appeared to view this as an attempt to recover lost share, the target was a high growth target. This was because the target level was the 2008 share, before losses of customers (particularly to importers) between 2008 and 2010. It said that this was evidence of the market being in a permanent state of flux. It told us that it showed that its senior cement executives had no predetermined idea what Hanson's market share ought to be.

8.104 We note that the target set was a previous share level rather than Hanson seeking to maximize its opportunities for growth.

8.105 There are a number of references to Hanson having to try and increase its share 'by stealth', whilst also ensuring that Hanson did not make 'big gains that might destroy price'.<sup>103</sup>

8.106 In relation to one of the references in the documents to growing 'by stealth', Hanson commented that this indicated an organic growth strategy that could take a couple of years to grow share. Hanson believed that there was considerable complexity and

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<sup>100</sup> See Appendix 8.3, paragraph 15.

<sup>101</sup> See Appendix 8.3, paragraphs 18, 19, 25 & 43.

<sup>102</sup> See Appendix 8.3, paragraph 15.

<sup>103</sup> See Appendix 8.3, paragraphs 15, 17 & 25.

uncertainty in market transparency, allowing Hanson to grow share without being visible to competitors.<sup>104</sup> In relation to another document,<sup>105</sup> Hanson said that this related to packed cement and its strategy was to maintain a healthy margin and not jeopardize margin by chasing volume and market share. It explained that the strategy was to offer customers a competitive price but also to place a greater emphasis on Hanson's high level of customer service and quality. It commented that market visibility could be limited in that it could win business without it being visible to its competitors.

8.107 We consider it noteworthy that Hanson considered avoiding transparency to competitors of any growth in its share to be important.

8.108 In one email from July 2011, [Hanson Senior Cement Executive] said:

Gents As you will know, our share for May dropped to concerning levels of 18.9%. I know there were reasons for this and we are carefully managing our approach to the market, but we must focus to get ourselves back to 20.5% consistently ... I need all four of us to ... get back on track intelligently whilst not crashing price or starting WW3.<sup>106</sup>

8.109 Hanson told us that this email was evidence of a continually declining market share, which had resulted from Hanson's lack of prioritization of market share as an objective, Hanson having allowed market share to fall. Once, however, its share fell to below 20 per cent, Hanson told us that it became concerned at that time that it might then be losing its status as a significant Major, and so refocused its strategy at that time to try to make back some volume. Hanson also said that [Hanson Senior Cement Executive] was attempting to encourage the sales team to pursue more

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<sup>104</sup> See Appendix 8.3, paragraph 15.

<sup>105</sup> See Appendix 8.3, paragraph 25.

<sup>106</sup> See Appendix 8.3, paragraph 220.

business, but not at the expense of price and profitability, thereby avoiding the situation in which the sales team drastically reduced its prices in order to chase volume. Hanson said this email was evidence that market share was expressly held by it as being subordinate to profitability.

8.110 However, some of Hanson's strategy documents state that Hanson's target was to retain share or that it recognized that it was not realistic to increase market share in the context of the prevailing market conditions.<sup>107</sup>

8.111 Hanson said that from its point of view, market share was merely one metric of business performance, and margins and operating income were a far more important metric for Hanson.

8.112 Hanson said that we had failed to show what precise market share Hanson sought to maintain. Hanson told us that its market share had declined very significantly over time (see the footnote to paragraph 7.8) and as such there could be no consistent market share to maintain. We explain the focal point for coordination in paragraph 8.164, but we did not consider it necessary for us to specify the precise share targets for each member of the coordinating group, since these might vary in response to changes in circumstances, and our assessment of the effectiveness of competition in these markets did not depend on our ability to specify these figures precisely. Hanson also made a number of comments in relation to our observation that there had been little evidence of any GB cement producer pursuing a strategy of organic growth. First, Hanson pointed to emails showing competition taking place as providing clear examples of where Hanson had worked to improve and grow within its operative markets. Second, Hanson pointed to data it provided on movements in

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<sup>107</sup> 

Hanson's market share.<sup>108</sup> Finally, Hanson referred to data submitted showing customers targeted by both Hanson and Cemex month on month from June 2010 to December 2012 (by way of example) which Hanson argued demonstrated intense competition between GB producers.<sup>109</sup> We discuss in paragraph 8.176 that competition within bounds (for example, for the most profitable customers) is compatible with coordination.

8.113 Overall, we considered that there was evidence that at different times during the 2009 to 2012 period:

- (a) Each of Cemex, Hanson and Lafarge wanted, in a limited manner, to increase its market share. For example, the targeted market shares often reflected market shares previously achieved by firms (in the case of Hanson and Lafarge) and/or the documents suggest that the desire for increased share may have been driven by specific events during that period (in particular, in the case of Lafarge the Lafarge–Tarmac JV) or the focus appears to be in relation to a specific segment (for example, Hanson in relation to packed cement).
- (b) There was also evidence that at least Hanson and Cemex aimed on other occasions to maintain their respective market shares.<sup>110</sup>

8.114 The observations on market share strategy must also be read alongside the examples in the documents of an approach between GB cement producers of balancing positions between the rival cement producers—this is discussed more fully in the subsection on tit for tat below (see, in particular, paragraphs 8.117 to 8.119 and 8.128).

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<sup>108</sup> This is discussed in Appendix 7.10.

<sup>109</sup> This is discussed in Appendix 7.9.

<sup>110</sup> We note that, in a market with declining demand as occurred during the 2007–2009 period, a strategy aimed at maintaining market share would involve accepting reduced sales volumes. In the context of a demand shock, overcapacity and high fixed costs, we would have expected aggressive competition to maintain previous volumes rather than share (see paragraph 8.3).

◦ *Tit-for-tat retaliation*

8.115 As outlined above, in referring to tit-for-tat retaliation in the context of our internal document review we are describing the situation where Major A targets the customer of another Major, Major B, or reduces cross-sale purchases from Major B on the basis that Major B has won business from Major A or has reduced cross-sale purchases from Major A. This behaviour can be used to punish deviation from a coordinated approach and to 'rebalance' the volumes of business or market shares enjoyed by the Majors. We also recognized that different Majors may engage in this behaviour at different times and/or with differing levels of frequency depending upon a variety of factors.

8.116 From our review of the 2012 documents, we identified some evidence of certain GB cement producers: (a) planning or anticipating taking tit-for-tat retaliation against competitors in the manner described above; (b) perceiving themselves to be experiencing such tit-for-tat behaviour (ie due to gains made from another, Major A, Major B considers that its customers or business are being targeted in response by Major A); and (c) anticipating that it will be subject to such tit-for-tat retaliatory behaviour because of recent gains it has made vis-à-vis another GB cement producer.

8.117 In the 2012 documents the weight of the examples identified are in relation to Hanson engaging in this behaviour. An example of (a) can be found in an email sent by [Hanson Senior Cement Executive] to [Hanson Senior Cement Executive] on 5 June 2011 in relation to Hanson's 'Market share and gains & losses'.<sup>111</sup> In his email, [Hanson Senior Cement Executive] detailed the volumes which Hanson Cement had lost to a range of competitors. Taken together, those losses were thought to

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<sup>111</sup> See Appendix 8.3, paragraph 209. Hanson told us the email clearly demonstrated how Hanson sought to win volumes from across the market, as opposed to adopting a strategy of singling out the customers of a single competitor by way of a punishment mechanism. However, we considered that the email provided direct evidence of Hanson seeking to recover cement volumes from competitors according to the volumes those competitors had gained from Hanson.

constitute 0.64 per cent of the market. [Hanson Senior Cement Executive] stated that (emphasis added):

We obviously have to get business back with the others but if you include [X] the net loss to Lafarge for grey is 39,750 tonnes

I suggest the following Action plan

We identify *40,000 tonnes of Lafarge business to take* in the North (as we don't want to pick business up in Ketton) and take it quickly ...

We Identify *4,000 tonnes of Dragon business and take it quickly*

We Identify 5,000 tonnes of Dudman business and take it quickly

We Identify 1,300 tonnes of Paragon business and take it quickly

We look at Cemex carefully and factor in discussions between [X] and [X]

We look at the BLI strategy in light of the new supplies of white etc and extra ggbs sales to Tarmac before we make a decision.

8.118 [Hanson Senior Cement Executive] replied<sup>112</sup> stating (emphasis added):

... Also remember on the packed business we took 10k tonnes from Cemex.

Agree with your plan re import losses- start immediately and get business back

*After you have prepared a list of Lafarge targets we can discuss and decide – suggest you look North and South at first...*

*At this stage I suggest we do not attack Cemex*

BLI – we will evaluate and maybe take some packed business

...

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<sup>112</sup> See Appendix 8.3, paragraph 210.

8.119 On 29 June 2011, [Hanson Senior Cement Executive] sent an email to [Hanson Senior Cement Executive] outlining the actions being taken in relation to the losses and gains from each of Hanson Cement's competitors.<sup>113</sup> In his email, [Hanson Senior Cement Executive] noted that Hanson Cement was now 'equal' with Cemex following gaining new business. He also observed that as Hanson had won some business from Lafarge, this meant that there was by then a smaller amount of volume to 'get back'.

8.120 Although Cemex was not to be 'targeted' in the context of the above email exchange, on 17 May 2012 [Hanson Senior Cement Executive] emailed<sup>114</sup> various Hanson cement employees stating (emphasis added):

In the last few days we have been attacked by Cemex ...

Please highlight the cells in green for ones we can get and orange for ones we are unlikely to get but will make Cemex go and have to defend the business by reducing prices.

*Every time any of our competitors hits us I want to hit them back twice as hard so if Cemex make us defend an account I want make to also hit them at another account.*

8.121 In September 2010, [Lafarge Senior Cement Employee], emailed [Lafarge Senior Cement Executive] others with the subject heading 'Cemex quote for [REDACTED]' and stating:

... Cemex appear to be making major play for [REDACTED] business. Their rationale seems to be two-fold, firstly to pick-up a [REDACTED]. [REDACTED] volumes in the Midlands and SE would match their aspirations and not compromise their packing capacity. Secondly the European dimension to their

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<sup>113</sup> See Appendix 8.3, paragraph 214.

<sup>114</sup> See Appendix 8.3, paragraph 343.

business is also attractive. [X] hinted that Cemex also have ambitions to grow their business with [X] in [X].

Whatever the motivation the prices offered are extremely low and undercut our own prices significantly. ... I guess we are faced with four options:

- 1) Refuse to move our price and insist [X] honour the current Trading Agreement which runs out next July. [X] can accept this and we retain the business for the next nine months at which point I'm sure Hanson and Cemex [Email incomplete]
- 2) Also refuse to move our price and [X] switch some business to Cemex immediately. We would then get involved in a legal wrangle over the Trading Agreement, refuse to pay a hefty slug of rebate and break what until recently has been a very positive relationship.
- 3) Nullify part or all of the price increase announced for January to meet in part [X] demand.
- 4) Seek a compromise on the current prices now and leave the price increase in place for January (negotiation pending).<sup>115</sup>

8.122 [Lafarge Senior Cement Executive] forwarded the above email to [Lafarge Senior Cement Executive] and stated that there was a 'significant issue with [X]'. [Lafarge Senior Cement Executive] replied<sup>116</sup> asking for [Lafarge Senior Cement Executive] (emphasis added) 'take on this opportunistic move and your recommendation. In the mean time *what is our counter attack position and when and where can you make it*'.<sup>117</sup>

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<sup>115</sup> Appendix 8.3, paragraph 49.

<sup>116</sup> See Appendix 8.3, paragraph 50.

<sup>117</sup> Lafarge commented in relation to this document that the email invited [Lafarge Senior Cement Executive] to comment 'on an appropriate strategic response to competitive action by Cemex' although no distinction was made between a response to competitive action by Cemex and that of BLI, Dudman Group, CRH or any other supplier. According to Lafarge, the email corres-

- 8.123 In an email from May 2012 Cemex's [Cemex Senior Cement Executive] writes to a number of cement colleagues 'As you will see from the email trail **Lafarge have taken market share ... we must regain our lost share ...** lets go for [Lafarge].'<sup>118</sup>
- 8.124 In an email exchange from September 2012 titled 'Hanson attacks', [Cemex Senior Cement Employee] of Cemex writes to [Cemex Senior Cement Executive] that: '[role unknown] is experiencing a lot of attacks from the Hanson Rep in his area. It appears to be an isolated case as nobody else is reporting it. ... [X] is chomping at the bit to give him a taste of his own medicine. Are we ok to go ahead?' [Cemex Senior Cement Executive] responds: 'If we have defended and its cost me money go for it but be sensible. I will also be letting you off the leash on [X].'<sup>119</sup>
- 8.125 An example of categories (b) and/or (c) outlined in paragraph 8.116 is provided by an extract from a [Company X] document which appears to relate to May 2012. It is noted under the heading 'Price' that '[Company Y] are beginning to target us following recent gains'.<sup>120</sup> A further update document which appears also to relate to May 2012 states that '[Company Y] are quoting our customers aggressively following our recent gains. This will have an impact on price going forward'.<sup>121</sup> Under the heading 'Competitors', [Company X] noted:

[Company Y] have met with [X] with a view to regain business from ourselves. We gained this business [X].

[Company Y] have called a lot of our customers in last 7-10 days looking for new business.

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pondence shows that [Lafarge Senior Cement Executive] 'competitive reactions are the same regardless of the competitor to which Lafarge loses business or the product market in which that loss occurs'. See the third footnote to paragraph 8.218(f).

<sup>118</sup> See Appendix 8.3, paragraph 332.

<sup>119</sup> See Appendix 8.3, paragraphs 418 & 419.

<sup>120</sup> See Appendix 8.3, paragraph 324. [Company X] said that the 'gains' referred to were cement volumes previously supplied by [Company Y] that were taken in-house by [Company X] in [X]. It said that it was normal commercial behaviour for a cement producer which had lost volume, in this case [X], to seek to recover volumes. It said it had anticipated that [X] would target customers of all cement manufacturers, including [X] customers, and that this anticipated behaviour was what was reflected in the extract in the commercial report. See paragraphs 8.127-8.131 below in relation to our observations from other 2012 documents of [X] and [X] actions following [X] internalization in [X].

<sup>121</sup> See Appendix 8.3, paragraph 358. See also Appendix 8.3, paragraphs 363 & 364.

[Company Y] have priced [X]. High risk of losing account.

8.126 Additionally, on 1 May 2012, [Company X Senior Cement Executive] emailed<sup>122</sup>

[Company X Senior Executive] with the subject line [X]. [Company X Senior Cement Executive] stated:

[X]

On that basis I will push the button for the RMX switches in [X] anyway as we cannot afford to wait. We should tell [Company Y] that we need to recover market share.

8.127 [Company X Senior Cement Executive] then forwarded<sup>123</sup> this email to [a second Company X Senior Cement Executive] stating: 'Need to chat through with you before we press the button. I'm in [X] tomorrow'. On 6 May 2012, [the second Company X Senior Cement Executive] emailed<sup>124</sup> [the first Company X Senior Cement Executive] with the subject [X] stating (emphasis added):

I have just received a phone call.

*[Company Y] have attacked our business at [X] and [X] following us taking [X]. [Company X employee] is meeting them this week and obtain details.*

8.128 Later on 26 June 2012, [the second Company X Senior Cement Executive emailed<sup>125</sup>

[the first Company X Senior Cement Executive] stating (emphasis added):

... We now have better quality market share in [X] by going internal and ditching [X] of [X] but the attacks by [X] has put a big dampener on that plan.

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<sup>122</sup> See Appendix 8.3, paragraph 329.

<sup>123</sup> See Appendix 8.3, paragraph 330.

<sup>124</sup> See Appendix 8.3, paragraph 335.

<sup>125</sup> See Appendix 8.3, paragraph 369.

*I think we should take [Company Y] supplied plants off them in [X] and let [X] go. Also I might get better deal from [X] than [X]. I won't know until July so we should keep the volume for now. Also as market share is our chosen strategy then we should keep for now as in expecting further losses and a possible fallout with [X]. I'm meeting [X] next week ...*

8.129 We understood the above emails as showing that:

- (a) [Company X] internalized RMX cement supplies in [X] because it wanted to recover lost market share (and to obtain better 'quality' share).
- (b) [Company X] then considered that [Company Y] responded or retaliated by 'attacking' its business in [X] by approaching its customers.
- (c) [Company X] then in turn envisaged taking business off [Company Y] in [X] in response.

8.130 Tarmac commented in its own internal documents on the [Company X] internalization and [Company X's] response. On 6 June 2012, [Tarmac Senior Executive] emailed [Tarmac Senior Cement Executive] and [Tarmac Senior Executive] in relation to '[Company X] – [X]' and stated:<sup>126</sup> 'I was informed on Friday that [Company X] have repatriated all their cement in [X], with no prior warning. This will impact on [Company Y] circa 60K/T per annum so that means they will be looking for a home for the remainder of 2012 of approx 30K/T....'

8.131 On 8 June 2012, [Tarmac Senior Executive] sent a further email to the same recipients with the subject line 'Cement Activity in [X]' and stating:<sup>127</sup> '[Company Y] have retaliated/responded by taking all the business off [Company X] for [X] and

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<sup>126</sup> See Appendix 8.4, paragraph 36.

<sup>127</sup> See Appendix 8.4, paragraph 37.

another independent. Things are moving quickly in the cement market in [redacted], now [Company X] are looking at a cement surplus.'

8.132 A further example of category (c) outlined in paragraph 8.116 is that in July 2012 Hanson was considering internalizing cement volumes which were then being supplied by Lafarge.<sup>128</sup> This option was being considered in the context of price negotiations between Lafarge and Hanson where Hanson was seeking a reduction in the price it paid Lafarge for cement. On 6 July 2012, [Hanson Senior Cement Executive], emailed a number of Hanson employees with the subject line 'Internalisation – Urgent' and stated (emphasis added):<sup>129</sup>

... We are internalising 5 of the Hanson South West plants) which ones is yet to be decided) from Lafarge CEMI to our own CEMI from Monday or Tuesday next week

*Please be on red alert as they will probably go into our customers to win the volume back*

Please can you defend at every account and also let me know asap who you think many be vulnerable accounts in your areas ...

8.133 Additionally, we noted that there is evidence that Hanson considered that if it 'took' packed cement business from Cemex or Lafarge it would 'have to consider giving them concrete business'.<sup>130</sup> A later email suggests that Hanson planned to take a specific amount of volume of cement business from Cemex but would give Cemex the exact same amount of 'Hanson plants' business back to Cemex.<sup>131</sup>

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<sup>128</sup> See Appendix 8.3, paragraphs 372-388.

<sup>129</sup> See Appendix 8.3, paragraph 378. Hanson provided background information to this email showing that the relevant internalization and transactions never occurred, and thus remained hypothetical in the context of what Hanson said were the ongoing uncertainties in the market. However, we considered that this email provided evidence of the commercial strategy and approach to the market adopted by Hanson, even if these particular plans were not put into action.

<sup>130</sup> See Appendix 8.3, paragraph 17.

<sup>131</sup> See Appendix 8.3, paragraph 18.

8.134 Cemex said that in some cases it made rational sense to recover volumes from a supplier or a customer of a supplier to which Cemex lost volumes. It said that there was no consistent trend identified by the CC to indicate that Cemex always attacked the customers of the supplier to which it has lost business. It said that Cemex and other suppliers were always seeking to win customers and pointed to various emails showing competition between suppliers, and said that in the vast majority of cases these were not the customers of the supplier to which that supplier has lost business. We explain why we think a degree of competition between GB cement suppliers within bounds is compatible with coordination in paragraph 8.176.

8.135 Lafarge Tarmac said that the language of retaliation used in internal documents referred to a wide range of unilateral, competitive responses to actions by all competitors. There was no distinction in the internal materials between 'retaliatory' responses to members of the alleged coordinating group and other cement suppliers. It said that we had failed to identify any factors that justified treating one act of 'retaliation' or competitive response as part of a coordinated punishment mechanism and another as a unilateral response.

8.136 Hanson said in relation to the reference to emails using the language of retaliation that emails that showed aggressive sales staff attacking a competitor's customer base and using colourful language when incensed at suffering the loss of one of their own customers could be found in sales teams in any industry. Hanson said that the realities and context of each email must be taken into account. The emails had been sent by sales people under pressure to hit targets and facing increasing competition and the aggressive sales speak that such an atmosphere encouraged was not factored into the CC's thinking. Hanson argued that it was not fair to list such emails in isolation without a due assessment of whether the competition in the market was restricted to such practices.

8.137 In relation to the above comments we note that our observations here are not focused on the language of ‘retaliation’ rather the substance of observing tit-for-tat behaviour (ie where Major A targets the customer of another Major, Major B, on the basis that Major B has won business from Major A). As noted above, we did not expect to see an entirely ‘consistent’ trend of evidence of this behaviour from any individual firm or from all firms. We note in particular in relation to Cemex the limited documentary email evidence available to us as a consequence of Cemex’s document retention policy. Moreover, it is not necessary for us to determine that a Major or GB cement producer ‘always’ engaged in tit-for-tat behaviour or that competition in the market was ‘restricted to [the use of] such practices’ in order for it to be a matter of concern. We acknowledge that there is evidence in the 2012 documents of both competition (see paragraph 8.150) and tit-for-tat behaviour.

8.138 What is striking from our review of the documentary evidence is that tit-for-tat behaviour (ie behaviour aimed at specifically punishing or recouping volume from a player who has taken a customer) appears to be a strategic focus for a number of the GB cement producers and is a systematic way of engaging in the market. We note that there are examples where the documents expressly suggest that the tit-for-tat response is not rational commercial behaviour, at least in the short term.<sup>132</sup>

8.139 We note that tit-for-tat strategies are not used by Lafarge and Hanson exclusively to cover actions against other members of the coordinating group (see the third footnote to paragraph 8.218(f)). We do not consider it surprising that the same approach to engaging in the market spills over into interactions with other rivals. What is significant is that, when used against other members of the coordinating group, there is a mutual recognition that this is an action to correct deviation from a coordinated approach or to balance volumes between firms. In our review of internal documentary

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<sup>132</sup> See, for example, Appendix 8.3, paragraphs 160-161, and Appendix 7.14, paragraphs 6-7 & 37.

evidence, we simply observed qualitative evidence of tit-for-tat behaviour taking place. This qualitative evidence is considered alongside a range of other evidence in our overall assessment of competition in the GB cement markets.

◦ *Price increases*

8.140 With respect to the 2012 documents, there appeared to be less proximity in the timing of the implementation of price increases than is observed in the 2008 documents. As would be expected in light of the economic conditions during the relevant period, there is also substantial evidence of customer resistance and GB cement producers having to adapt proposals in negotiations.

8.141 However, we noted that, despite the customer resistance to price increases during the period covered by the 2012 documents, it would appear that the Majors were able to achieve price increases even if they considered that the increase achieved was 'limited'.<sup>133</sup>

8.142 We also noted that in one strategy document looking at a review of pricing strategy in cement, [Company X] describes itself as 'price followers; usually second to announce; announcement higher than competition; pushing towards maintaining pricing levels as much as possible'.<sup>134</sup> In another document, [Company X] 'long-term price strategy' is given as: 'Follow Lafarge above their announced increase' and 'Look for opportunities to Increase reciprocal trading', as well as 'Increase share in packed cement (high margin)' and 'Increase share in growing and niche markets'.<sup>135</sup> We noted that [Company X] description of this price strategy reflected the market leadership role ascribed to Lafarge in the 2008 documents, discussed above in

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<sup>133</sup> See, for example, Appendix 8.3, paragraphs 93 & 98.

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paragraphs 8.59 to 8.63. It also noted in a 2010 plan<sup>136</sup> that ‘Cementers announce increases in Q4 for following Q1 implementation. Attempts for more than one increase a year have failed’.

8.143 [Company Z] appears to have considered itself to be a ‘market follower rather than market leader’.<sup>137</sup>

8.144 One document from Tarmac includes an exchange with [an importer] in which the importer provides a commentary, as an active market participant, on how it perceives the GB cement market to operate. On 28 June 2011, [an importer] emailed [Tarmac Senior Cement Executive] stating as follows (emphasis in the original):<sup>138</sup>

I just thought I would ask of you to pass on some news which you should be immediately aware of.

I without hesitation attach a copy of my firms generic increase letter from July 4<sup>th</sup> to our clients for your attention.

I thought we were all trying from July 4<sup>th</sup> 2011 to ensure sale prices rise and we ALL can put a little stability back into our Industry as we have lost our control of the client base and they are telling us what we are doing with our business.

I write to inform you that we had a discussion today with a fixed outlet [X] which we, yourselves and Cemex all serve, they spread their business and credit around.

**We are faced today with the fact that your local team has informed [X] this week that Tarmac will not be implementing any increases to [X] from 1<sup>st</sup> July, in fact you are not the only ones, Cemex have offered the same.**

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<sup>136</sup> [X]

<sup>137</sup> See Appendix 8.3, paragraph 20.

<sup>138</sup> See Appendix 8.4, paragraph 26.

As majors you have responsibility to act responsibly in the market and set by example as it makes a complete mockery of your status and in front of others majors when they are made aware.

Do not think for one minute that this is stopping with you, I will also be holding Cemex to account on this same issue also as if we all do not do something about the huge decline in our margins, our businesses shall be in ruins and our industry disgraced and destroyed.

I would like to know what you are prepared to do about investigating your Sales Team acting in such an unprofessional and anti-competitive manner and get to the bottom of what actually has been said and why and maybe let me know.

We are also very aware that Clients also lie as they have been able to con us all against one and other in the last two years and if Tarmac have no control of what is being said or done in your name, you need to know, likewise if we have a rogue client, this also needs to be known by us all

Every major should set the example and be proud of doing so and I for one will make my business stand up and play its part now and in the years to come – will you ?...

8.145 We note that Tarmac responded by letter dated 30 June 2011 strongly refuting any suggestion that Tarmac Group had engaged in any agreement or understanding contrary to competition law.<sup>139</sup>

◦ *Imports*

8.146 Importers of cement are closely monitored.<sup>140</sup> The documents make reference to the constraint from importers and include examples of GB cement producers losing

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<sup>139</sup> See Appendix 8.4, paragraph 27.

customers to importers in some cases or having to drop price to defend an account against importers. There are several documents that refer to importers having a downward pressure on pricing/affecting ability to increase prices.<sup>141</sup>

8.147 The threat of imports is mentioned in several Hanson strategy documents.<sup>142</sup> The threat of imports is also mentioned in a number of Cemex strategy documents: 'Importers a growing threat (11% share in 2010) including [REDACTED] (2%)'.<sup>143</sup> One document states that 'Price potential in UK needs to consider potential imports', and gives a price ceiling due to imports of £[REDACTED]-[REDACTED] FOB.<sup>144</sup>

8.148 There are examples of steps being considered, and in some cases taken, by Cemex, Hanson and Lafarge to react against this threat which appear to go beyond simply competing on price/better service etc, including:

- the possible purchase of [REDACTED] UK operations by Lafarge;<sup>145</sup>
- action by Lafarge against [REDACTED] in Ireland because of imports to GB;<sup>146</sup>
- action by Lafarge against [REDACTED] in Northern Ireland because of imports to GB;<sup>147</sup>
- targeting of [REDACTED] by Hanson;<sup>148</sup>
- targeting of [REDACTED] by Hanson and Hanson considering wider European options to target [REDACTED] in response to actions by [REDACTED] in relation to customers in the market and [REDACTED] supply;<sup>149</sup>
- targeting of [REDACTED] by Cemex;<sup>150</sup> and
- targeting<sup>151</sup> of [REDACTED] by Hanson.<sup>152</sup>

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<sup>140</sup> See, for example, Appendix 8.3, paragraphs 81, 106 & 401.

<sup>141</sup> See, for example, Appendix 8.3, paragraphs 106, 242, 244 & 267.

<sup>142</sup> For example, [REDACTED].

<sup>143</sup> [REDACTED]

<sup>144</sup> [REDACTED]

<sup>145</sup> See Appendix 8.3, paragraph 30. In this document Lafarge considers the possible acquisition of [REDACTED] cement import terminal in [REDACTED]. It identifies the main driver as the purchase of market share and states 'With other players benefiting from improved market structure', observing that '[REDACTED] is active in [REDACTED] area and may improve his rationality and reduce pressure on prices.' Lafarge noted that this acquisition proposal was not pursued by Lafarge.

<sup>146</sup> See Appendix 8.3, paragraph 106.

<sup>147</sup> See Appendix 8.3, paragraphs 160-162.

<sup>148</sup> See Appendix 8.3, paragraphs 284-287.

<sup>149</sup> See Appendix 8.3, paragraphs 268, 271/272 & 402.

<sup>150</sup> See Appendix 8.3, paragraphs 418 & 419.

8.149 We also observed an example of an agreement between Hanson and Cemex whereby Cemex promised Hanson to stop GGBS imports from Germany to the UK and buy GGBS exclusively from Hanson.<sup>153</sup>

- *Price competition*

8.150 The documents include many examples of price competition taking place with GB cement producers noting that they have been undercut by other GB Cement producers or importers and have either lost accounts or had to reduce their price to defend.

8.151 Hanson commented that we had not done a detailed analysis of the documentary evidence of competition taking place. It pointed to the small percentage of emails we analysed in detail and suggested that the remainder, representing the overwhelming majority, displayed clear and strong competition between the GB cement producers and importers. Hanson told us, for example, that our entire body of email analysis with regard to business between Hanson and Lafarge (for the period for which we requested internal documents, ie 2010 to 2012) included thousands of emails showing strong competition between Hanson and Lafarge and none of concern with regard to the ongoing market review.

8.152 However, as a preliminary point we would note that it is not the case that the remainder of the emails each showed clear and strong competition. We identified particular documents of concern. There are other documents which provide evidence of competition taking place (and some of those are included in our chronologies in Appendices 8.3 and 8.4). We note below that there are many examples in the emails

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<sup>151</sup> Hanson said in relation to retaliation against [X] that it was implicit in our analysis that 'retaliation' against a GB cement producer amounted to a punishment mechanism, whereas here it appeared to mean an exclusionary mechanism targeted at an importer. Hanson argued that we were therefore taking an inconsistent approach. We do not agree. As set out in the third footnote to paragraph 8.218(f), the same type of behaviour is capable of serving more than one purpose.

<sup>152</sup> See Appendix 8.3, paragraph 71 & 72.

<sup>153</sup> See Appendix 8.3, paragraph 115.

of price competition taking place. We discuss in paragraph 8.176 that competition within bounds is compatible with coordination. There are also, however, a range of other documents that fall into neither of those categories. In this case we are not using qualitative documentary evidence alone to assess the balance between coordination and competition during a period, nor as the most important indicator. The market outcome evidence summarized in paragraphs 8.3 and 8.4 demonstrates clearly that competition is not working effectively in the GB cement markets.

8.153 Hanson commented that if retaliation represented a successful punishment mechanism or a mechanism to exclude or minimize the impact of the competitive fringe, one would expect intermittent and rare outbreaks of competition and retaliation rather than a continuum of competition. Hanson told us that it had clearly demonstrated the contrary, in that the mutual attacks on common customers were continuous and monthly, for example as shown between Hanson and Cemex, as opposed to following the intermittent retaliatory model that Hanson said we suggested. We address Hanson's argument in paragraph 8.200 and we also set out in paragraph 8.176 why competition within bounds is compatible with coordination.

8.154 Hanson observed that in all the emails there was not a single instance of a direction being given to the sales force or of any general sales strategy to avoid seeking business from the customers of other key cement producer competitors. Hanson argued that, were the model and mindset of coordination to exist in the manner we claimed, one would expect to see regular and numerous examples of such emails in the form of directions ordering sales staff to refrain from going into business areas/ customers which might prove of concern to (in the case of Hanson) Lafarge or Cemex. According to Hanson, the fact that such emails and directions were absent was crucial and would lead any objective assessment to conclude that there was no

evidence of sales teams being directed to avoid the customers or areas of the producer competitors.

8.155 However, we did not consider that we would necessarily expect to see such express directions, particularly in an industry where a strategic approach to interacting in the market aimed at coordination has endured over time. In this section and in Appendices 8.2 and 8.3 we describe documents in which Cemex, Hanson and Lafarge adapt their behaviour in the market to achieve a coordinated outcome. We note that, within that document set, there are emails in which directions are given either to attack or not to attack a particular rival, in response to customer losses to that rival. We also see evidence of competition taking place and are not suggesting that competition is entirely eliminated. We discuss in paragraph 8.176 that competition within bounds is compatible with coordination.

*Conclusions from internal documentary evidence*

8.156 We considered it important to use the documentary evidence to assess the way the market was operating over time and not at a particular point in time. We note that, as well as the three categories of documents discussed in this subsection, we have also taken into account the 2009 internalization documents discussed in paragraphs 8.75 to 8.77. We sought to identify what all these documents overall told us about the dynamics of the cement market over time, having considered each set of documents in the context of the conditions prevailing during the particular period they capture.

8.157 When assessed on that basis, we consider that the documentary evidence is consistent with a market in which, over time, although some competition is taking place,<sup>154</sup> coordination by some market participants (namely Lafarge, Cemex and Hanson) is also taking place. The documents suggest that the balance between coordinated and

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<sup>154</sup> A degree of competition within bounds is compatible with coordination for the reasons set out in paragraph 8.176.

competitive behaviour is not constant throughout the period we investigated and may be influenced in part by market conditions. They also show that attempts to achieve coordinated outcomes are not always wholly successful.

### *The mechanism for coordination*

8.158 Given the evidence from the internal documents showing the existence of coordination in the GB cement markets, we next considered in more detail the mechanism for coordination. In other words, we assessed how coordination was taking place in practice. In doing so, we examined the susceptibility of the GB cement markets to coordination and how the three conditions for coordination to be sustainable (as set out in paragraph 250 of the Guidelines) are met in those markets.

8.159 Paragraph 250 of the Guidelines states that:

Three conditions are necessary for coordination to be sustainable in a market:

- (a) Firms need to be able to reach an understanding and monitor the terms of coordination. Where there is no explicit agreement, firms need to have sufficient awareness of each other and be able to anticipate each other's reactions so as to identify a mutually beneficial outcome.
- (b) Coordination needs to be internally sustainable among the coordinating group—ie firms have to find it in their individual interests to adhere to the coordinated outcome; the firms must lack an incentive, or have a positive disincentive, to compete because they appreciate how each other will react. However, coordination does not need to be perfect or continuous to fulfil this criterion ...

- (c) Coordination also needs to be externally sustainable, in that coordination is unlikely to be undermined by competition from outside the coordinating group or from the reactions of customers.

*Ability to reach an understanding and monitor the terms of coordination*

8.160 The Guidelines state<sup>155</sup> that the following structural characteristics may help firms reach an understanding and monitor the terms of coordination: a non-complex and stable economic environment; simple and relatively undifferentiated products; customers with easily identifiable characteristics; firms that are relatively symmetric (although coordination may also be possible in markets displaying elements of asymmetry); firms with cross-shareholdings, participating in JVs with each other and/or in reciprocal supplier/buyer relationships; the need of firms to make a long-term market commitment; and the existence of institutions and/or practices facilitating the sharing of information.

8.161 We first consider the extent to which firms would be able to reach an understanding on the terms of coordination in GB cement markets (and what the ‘focal point’ for coordination would be), and then we consider the extent to which firms would be able to monitor the terms of coordination.

- *Reaching an understanding*

8.162 We have found a number of factors that contribute to transparency in the GB cement markets, and that therefore also contribute to the ability of firms to reach an understanding on the terms of coordination:<sup>156</sup>

- (a) The market is highly concentrated (see paragraphs 7.6 to 7.15), which means that firms are likely to have high awareness of each other’s actions.<sup>157, 158</sup>

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<sup>155</sup> The Guidelines, paragraphs 252 & 253.

<sup>156</sup> Many of these factors are mentioned in paragraph 252 of the Guidelines, and some are additional.

- (b) Given the very large sunk investments needed to enter the market and the long economic life of the key assets (see paragraph 7.50 and Appendix 7.7), firms must make a long-term market commitment, which in turn means that interactions between firms continue over many years.
- (c) The environment in which cement producers compete is not particularly complex: cement is a largely homogenous product (see paragraph 7.20) which can be transported over large distances (see paragraph 7.21) ; there is a large amount of stability in the customer base for cement (see paragraph 7.26); there are only a limited number of cement plants in GB (see paragraph 2.48) and high barriers to entry into GB cement production (see paragraph 7.50); the production processes for cement are largely similar and the cost structures of the various cement producers are also relatively similar (see paragraph 7.134).<sup>159</sup>
- (d) The GB cement producers are engaged in various JVs with each other (see paragraph 7.131), are members of the same trade associations (see paragraph 7.132) and, more importantly, purchase and/or sell cement to each other (see paragraph 7.202). All these factors are likely to increase transparency in the market and provide channels for communication between the GB cement producers.
- (e) There is a high amount of transparency for each GB producer of its own market shares on a monthly basis (through MPA data—see paragraph 8.166), and on

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<sup>157</sup> Cemex told us that concentration in the GB cement markets had been reducing since 2007, as a result of the increase in the share of importers and of Tarmac, and would further reduce following the entry of HCM. We noted, however, that the number of GB cement producers had remained unchanged since 2007 and would remain unchanged after entry of HCM, that the total share of cement importers remained low, and that the collective share held by importers had remained stable between 2009 and 2011 (see Table 7.1).

<sup>158</sup> Hanson told us that the cement market contained a large number of players and new entrants if importers were included, making coordination impossible. However, we noted that there were only four GB cement producers which collectively held a large share of cement sales, making the market concentrated.

<sup>159</sup> Hanson told us that the extreme declines in demand for cement made any model of collusion both unsustainable and highly unlikely to succeed, and that the implications of such declines were clear in the economic literature. We noted that, although unpredictability in long-term demand for cement was likely to affect capacity decisions, it was unlikely to affect pricing decisions which are normally based on shorter-term considerations. In addition to this, we analyse in paragraphs 8.223–8.230 the variations over time in the evidence base and explain how we have taken this into account in forming our conclusions.

annual production by plant and yearly market shares by plant through EU ETS data (see Appendix 7.3).<sup>160</sup>

8.163 Although prices paid by individual customers to competitors are not transparent to each GB producer because they are individually negotiated, there appears to be a degree of transparency in prices because (a) information on cement prices can be gathered through discussions with customers (see Appendix 7.3) and (b) some prices are directly observed because cement producers are either customers or suppliers of each other (see paragraph 7.202). Moreover, there is considerable transparency in the price increase announcements of the cement producers (see paragraphs 7.169 to 7.178).

8.164 Therefore we found that coordination is likely to evolve mainly around share of GB sales made by the GB producers (ie for each producer, the focal point is its own share of GB cement sales, as a proportion of total cement sales made by GB producers),<sup>161</sup> but may be supplemented with the information on prices which can be gathered through discussions with customers and in the context of cross-sales, as well as through price announcement letters. While we did not find coordination on price to be likely (as prices are individually negotiated), we considered that the price announcement letters facilitated price leadership and price following in the GB cement markets<sup>162</sup> (consistent with our analysis of price parallelism—see paragraphs

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<sup>160</sup> Cemex told us that, because EU ETS data was annual and published in arrears, it did not contribute to the ability to coordinate. We agreed that EU ETS data was unlikely to be the primary source of information used for monitoring—we set out our views on how monitoring is achieved in paragraphs 8.165–8.8.170. However, we thought that the availability of EU ETS data would nonetheless be a valuable cross-check on the accuracy of other information used for monitoring purposes and would contribute to increased levels of transparency in the market on individual plants' production volumes and costs, particularly variable costs.

<sup>161</sup> We have not found evidence to explain how the accepted shares of sales for each coordinating firm are initially arrived at. We did not consider that the focal point for coordination was capacity nor that the accepted shares of sales for each coordinating firm were mechanically derived from each firm's capacity. An understanding on accepted shares of sales may have been reached before the period of time covered by our investigation. Although our investigation has focused on the period since 2007, there was evidence from both the internal documents and the other quantitative sources of information and data available to us that coordination was taking place prior to 2007 as well. However, we have not sought to identify the precise date coordination started.

<sup>162</sup> In our view, the existence of cross-sales would further enhance the role of price announcement letters in facilitating price leadership and price following. For example, Hanson told us that, in its capacity as a very large customer of Lafarge, Lafarge informed Hanson of the precise cement price increase Lafarge was planning to implement in mid-2008 as a customer courtesy, in the days before Lafarge had issued its price announcement letters. Hanson told us that, although Hanson had already taken

7.186 to 7.197<sup>163</sup>) and also softened customer resistance to price increases (see paragraph 7.185). When we refer to coordination on 'share of sales' in the remainder of this report, we mean coordination on share of GB sales made by the GB producers.

- *Monitoring of the terms of coordination*

8.165 We examined whether there was sufficient transparency to allow producers to monitor terms of coordination based on shares of sales.

8.166 As set out in paragraph 7.132, the MPA publishes data on monthly GB cement production and sales of cement by GB cement producer, with a one-month lag. Combined with data on its own sales and production, this information enables each GB producer to calculate its own monthly share of GB production and monthly share of sales by GB producers.<sup>164</sup> However, this information does not enable the calculation of market shares including imports, and does not show to which other supplier(s) share has been lost in the event of a loss. Therefore in order to monitor deviations from the coordinated outcome by others, GB producers would need to complement information on monthly share with other information. Monitoring of a producer's own wins and losses of customers, and of the supplier(s) to which these customers switched, would enable a distinction to be made between a change in share of sales due to deviation by another specific cement producer, a change due to switching to the competitive fringe (ie suppliers outside the coordinating group of firms), and a change due to a customer simply requiring more or less cement overall in a given

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its own decision to increase its prices across all business lines, this new information from Lafarge regarding the Lafarge increase effectively narrowed and constrained the price increase range that Hanson was considering (and ultimately implemented) for its own price announcement in mid-2008, since Hanson did not wish to lose business by being perceived as being more expensive than the market leader.

<sup>163</sup> Cemex told us that the price parallelism we observed was consistent with competition between GB producers because they faced similar costs. We agreed that the observation of price parallelism, by itself, was not direct evidence of coordination. However, in a market with high levels of price dispersion and where prices are individually negotiated, we thought that the price parallelism observed was evidence that price announcement letters served some purpose in signalling future price intentions resulting in alignment in changes in average prices of the GB cement producers over time.

<sup>164</sup> Cemex said that we had not presented evidence that cement suppliers systematically used MPA data combined with monthly win/loss data to understand to which supplier they had lost market share and that therefore that we had not shown how a producer could punish deviations on a regular basis. However, our review of internal documentary evidence highlighted many examples of suppliers monitoring market shares and wins and losses.

month (which would not represent a deviation from the coordinated outcome because another cement producer would not be responsible for the change in share<sup>165</sup>). In addition, a degree of monitoring of prices may also help cement suppliers to detect whether a deviation has occurred.<sup>166</sup>

8.167 Each GB producer also has some knowledge of demand conditions in downstream RMX markets via its own RMX business (for example, the identity of the RMX producers which have won or lost large projects). This also increases the amount of information available to GB producers, and helps them distinguish between reductions in share of sales due to a deviation and reductions in volumes due to a particular cement producer's customers not having performed well in a particular period.

8.168 The characteristics of both bulk and bagged cement customers and the way in which they purchase cement (see paragraphs 7.26 to 7.28) facilitate monitoring of wins and losses of customers:

- (a) Customers tend to purchase cement from fixed locations and the customer base for cement is stable over time, which means that it will be easy to detect, when a job site ceases purchasing, that this is due to switching (rather than, for instance, going out of business, or because the customer happens not to need cement for a particular time period).
- (b) Customers purchase cement very regularly, with deliveries in the case of bulk cement usually occurring at least once a month but possibly more often, which means that switching is likely to be detected rapidly (no long lead time before finding out that a customer has switched).
- (c) For bulk cement, customers tend to single-source for a given job site, which also makes it easier to detect switching.

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<sup>165</sup> Such changes in share (as a result of customers simply requiring more or less cement in a given time period) could be expected to occur randomly across the entire customer base, and to even out across cement suppliers over time.

<sup>166</sup> As noted previously, there is evidence that some information on prices charged by competitors can be gathered from customers and potential customers as part of the sales negotiation process.

- (d) Although GB cement producers have a large number of customers at any given time, the top 50 to 100 customers of each producer account for the large majority of its bulk cement sales, and the customer base for bagged cement is also fairly concentrated. Therefore the number of customers that need to be monitored is likely to be manageable in practice.
- (e) It will often be possible to find out, when a customer has switched, which supplier it has switched to, through contacts with customers (customers will often tell their existing supplier which other supplier they are switching to), as well as through observations as to which supplier is subsequently seen to be making deliveries to the customer.<sup>167</sup> The vertical integration of the GB producers into downstream markets for cement, especially RMX, gives them additional local information about these markets.

8.169 A number of internal documents indicate a close monitoring of GB producers' own share (on a month-by-month basis and sometimes at a regional level). They also indicate that the preservation of share appears to be a metric of business performance (see paragraphs 8.51 to 8.58 and 8.89 to 8.114). In a number of documents we also see references to maintaining market stability or observe a focus on balancing relative positions between the rival cement producers. The documents show that customers and volumes won/lost are monitored, and that this information is used to adjust estimates of share on an ongoing basis. The main metric that is monitored in the strategy documents appears to be the overall share of GB cement sales—including both bulk and bagged cement sales, as well as internal sales.

8.170 Internal documents supported our views on the monitoring of shares and wins and losses of customers by the GB producers. For example:

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<sup>167</sup> Cemex told us that customer behaviour was not simple to predict because of the degree of customer switching that took place, and that this factor would make coordination difficult. We disagreed that the ability to coordinate depended on the ability to predict customer behaviour: rather, the ability to coordinate depends (among other things) on the ability of GB cement producers to observe customer behaviour through monitoring of wins and losses and of market shares.

- (a) our analysis of the 2009 internalization event (see paragraphs 7.204 to 7.212), which suggested that Hanson and Lafarge viewed their own share of sales for all cement as their key metric. The evidence also showed that GGBS purchases could also be taken into account (eg Lafarge ceasing to purchase GGBS from Hanson following Hanson's); and
- (b) an internal email from Hanson which also suggested that overall share of sales was important: An email from [Hanson Senior Cement Executive] to [Hanson Senior Cement Executive] dated 22 August 2010 (titled 'Monday meeting at 12.00pm'); CC document 3, shows a series of complex interlinking questions around 'Lafarge options/swaps' and 'Cemex threats and options', among other issues. One bullet point states: 'If we decide to go for packed share from both Cemex and Lafarge we would have to consider giving them concrete business.' This suggests that Hanson might have to 'compensate' Cemex and Lafarge in the RMX market if it takes packed cement from them. A later email dated 6 September 2010 from [Hanson Senior Cement Executive] titled 'Notes from bulk strategy meeting' states that: 'We are going to take packed share from Lafarge and not relinquish any bulk share to them' and 'We are going to take 70,000 tonnes of packed business from Cemex and give them 70,000 tonnes of Hanson plants'.

- *Evidence for coordination on shares of sales from market outcomes*

8.171 We also examined whether some of the market outcomes we observed were consistent with coordination based on shares of sales. If there is coordination on shares of sales, we would expect to observe shares of sales which are relatively stable over time, at least within the coordinating group of firms. We analysed trends in shares of sales in paragraph 7.11. This analysis showed that coordination around national shares appeared to be more in evidence than coordination around regional shares, since there is more variability in regional shares than in national shares. At a national

level, we found that, although Hanson, Cemex and Lafarge had each seen a reduction in their share between 2007 and 2011, this was mainly to the benefit of Tarmac and importers. This evidence on trends in shares of sales is compatible with a degree of coordination on shares of sales in the GB cement markets, given what we found to be the different roles of the firms in these markets (see paragraphs 8.246 to 8.264).

8.172 We would also expect, if there were coordination on shares of sales, that shares of sales would not be particularly volatile, ie shares of sales would not show large movements from one period to the next. We found a lack of volatility in shares of sales in the GB cement markets (see paragraph 7.11), although we found that there was more volatility in monthly shares of sales than in annual shares, which suggested to us the existence of a mechanism by which short-term perturbations in shares were rebalanced.

8.173 In addition, we would expect 'negative autocorrelation' in changes in shares on a monthly basis if coordination were taking place on shares of sales. In other words, if the share of Producer A increased relative to other producers in one month, we would expect that the share of Producer A would reduce in the following month (assuming that one month is a sufficient time for producers to react to any changes in their market share). As set out in paragraphs 7.162 to 7.164, we undertook an analysis of month-by-month changes in share of sales and found negative correlation coefficients in own share changes for all GB cement producers,<sup>168</sup> which was consistent with coordination on shares of sales.

8.174 Customer switching between cement producers has the potential to undermine the effectiveness of coordination on shares of sales, as high levels of switching will

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<sup>168</sup> Coefficients were statistically significant for two of the four GB producers (Cemex and Lafarge) when looking at changes in shares in the following month, and statistically significant for the top three GB cement producers (Cemex, Lafarge and Hanson) when looking at changes in shares in the following two months.

generate instability in shares, making it more difficult for firms to reach a coordinated equilibrium. To the extent that switching events are associated with suppliers undercutting each other's prices in order to win back customers, then this could to some extent offset the adverse effects of coordination, ie stable shares may be achieved but prices may be eroded if there are high levels of switching.

8.175 Paragraphs 7.154 to 7.161 set out our analysis of cement customer switching. We found some periods of relatively high switching (late 2008 and 2009), and periods of relatively low switching (2010 and 2011)—see also our discussion of time variation in our evidence base in paragraphs 8.223 and 8.230.

8.176 A degree of customer switching between GB producers is compatible with coordination. If there is some competition between GB suppliers (for example, for the most profitable customers), such competition will not undermine any overall coordination on share of sales—and will be constrained in magnitude—if there is a mechanism to re-establish stable market shares and to punish deviations (which we consider to be the case—see paragraph 8.218). Further, such 'competition within bounds' does not result in cheaper prices for all customers, due to the ability of cement suppliers to price discriminate (see paragraph 8.4). We noted that evidence on market outcomes (see paragraphs 8.3 to 8.11) was consistent with coordination in the GB cement markets taking place throughout the period 2007 to 2011 (although it may have been more and less successful at different times—see paragraph 8.230).

8.177 Cemex told us that the switching analysis indicated relatively high levels of churn which made coordination around market shares difficult to sustain. Cemex also told us that that most customers obtained extremely competitive prices from existing suppliers and suppliers routinely had to defend volumes by lowering prices—therefore customers generally had little incentive to switch. Hanson made a similar argu-

ment: it told us that there was strong empirical evidence of GB Majors and importers either winning customers from Hanson or forcing Hanson to lower its prices, and referred us to the results of our switching analysis, the examples of threats to switch it had provided<sup>169</sup> as well as the 2012 internal documentary evidence.

8.178 We noted that the switching analysis did not show consistently high customer switching: rather, there were two years characterized by relatively high amounts of customer switching (2008 and 2009), and in other years customer switching was relatively low: wins of independent customers accounted for less than 5 per cent of the largest three cement producers' sales in every year except 2009 (see Appendix 7.9). We also noted that, despite some years exhibiting relatively high switching, market shares had tended to remain stable, which suggested to us that coordination around market shares was possible despite a degree of switching (see also paragraph 8.176). In relation to threats to switch, whilst there were some examples provided by the cement producers of having to reduce prices (or increase prices less than forecasted) in response to threats to switch, we noted that our analysis of average cement prices to all customers showed that cement prices had generally increased between 2007 and 2011 (with some reductions in 2009 compared with peak levels at the end of 2008). This suggested that customers who did not switch (whether or not they threatened to switch) did not on average achieve large price reductions (see paragraphs 7.146 and 7.159). We also noted that the evidence on market outcomes (see paragraphs 8.3 and 8.4) suggested that, overall and on average, switching and threats to switch had not been sufficient to erode the margins and profitability of the GB cement producers.

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<sup>169</sup> See Appendices 7.5 & 7.9.

- *Conclusions on the ability to reach an understanding and monitor the terms of coordination*

8.179 In view of the high degree of transparency of shares of sales, wins and losses of customers and customer–supplier relationships (and, to an extent, pricing behaviour at a general level) in the GB cement markets, the evidence of firms’ monitoring of these parameters and the evidence on market outcomes that were generally consistent with coordination on shares of sales (although varying over time), we concluded that it was likely that firms in the GB cement markets had the ability to reach an understanding and monitor coordination on the basis of shares of sales.

#### *Internal stability*

8.180 We now consider whether there are mechanisms through which the internal stability of coordination can be achieved in the cement market, such that all firms that are part of the coordinating group find it in their individual interests to adhere to the coordinated outcome. In a coordinated market, it is often in a firm’s short-term interest to deviate from the terms of coordination in order to increase profits unilaterally. However, if such deviation results in lower profits in the future because of the reaction of the other members of the coordinating group, a firm may be deterred from deviating.

8.181 The Guidelines state<sup>170</sup> that the following market characteristics can help increase the internal sustainability of coordination: a concentrated market, market transparency (which facilitates detection of deviation and increases the speed with which deterrence can take place), and other factors (such as the existence of excess capacity) which also increase the speed with which deterrence can take place.

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<sup>170</sup> The Guidelines, [paragraph 254](#).

8.182 The GB cement markets are concentrated (see paragraph 7.15) and there is considerable transparency in these markets (see paragraph 8.162). We therefore focused on whether effective deterrents to deviation existed, by first examining how deviations in cement were likely to take place and how profitable these were likely to be, and then looking at the effectiveness of different deterrent strategies.

- *Deviations in cement*

8.183 The incentive to deviate from coordinated shares of sales by increasing sales above the coordinated levels will depend on how profitable such a strategy would be. This depends on (a) the amount and profitability of additional sales or share a deviator will be able to capture; (b) the speed at which such deviation will be detected by competitors; and (c) if and when a deviation has been detected, the consequences for profits of any subsequent punishment period.

8.184 Prices for cement are negotiated individually by customers (see paragraph 7.148) and there are no 'posted prices' for cement which would be easily accessible to customers. This affects the way in which deviation in cement can take place and the feasibility of any large-scale deviation. Deviation from coordinated outcomes could take place by:

- (a) 'targeted' deviation: a firm wishing to increase volumes above coordinated levels may need to approach a number of customers of other producers with low price offers in order to make these customers switch;
- (b) deviation by announcing price increases substantially lower than competitors<sup>171</sup> (including, for instance, announcing a price reduction or no price increase, or announcing a delayed price increase<sup>172</sup>); and/or

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<sup>171</sup> Our data shows that, in relation to the price announcements regarding proposed price increases to take effect on 1 January 2012, one GB producer announced a lower price increase than the others.

<sup>172</sup> Our data shows that there was a delay to some of the GB producers' price increases on one occasion: when Tarmac and Hanson announced in late October 2009 price increases to become effective from 1 January 2010, Cemex and Lafarge subsequently announced (in late October and early December 2009 respectively) price increases to become effective from 1 March 2010.

(c) deviation through a firm's downstream RMX business. This would entail the lowering of RMX prices to final consumers in order to increase a firm's share of RMX business and thereby indirectly increasing that firm's cement sales at the expense of other firms' cement sales. We did not consider that this would be as effective or as immediate as targeted deviation, for the reasons set out in Appendix 8.5.

8.185 We considered that targeted deviation from the coordinated outcome was more likely than deviation via the announcement of lower price increases. The announcement of lower price increases would be likely to be highly transparent to competitors, who become aware of the contents of price announcement letters quickly (either because they receive these letters directly as customers of each other or because customers inform suppliers about the price announcement letters they have received from other potential suppliers). Therefore the speed at which such deviation would be detected would be likely to mean that any profits from such deviation would be short-lived at best, as other firms would be quick to react by lowering their prices to existing customers to prevent them from switching. This would result in a no-win outcome for all: lower prices and no increase in volumes for the attempted deviator.

8.186 Targeted deviation could be relatively small-scale, though it could be large-scale if a very large cement customer were approached and won from another cement producer. In this respect, the more concentrated the customer base, the larger the incentives to deviate.<sup>173</sup>

(a) If demand for cement is fragmented, in order to deviate, a cement producer may need to approach a relatively large number of customers to get sufficient profits from deviation. This makes it more costly to deviate, and also increases the risk

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<sup>173</sup> Even if the customer base is not very fragmented, another factor which could increase incentives to deviate is the existence of long-term exclusive contracts with suppliers. If firms bid at a given time to supply a large amount of demand over subsequent years, gains from one-off deviations may be increased. However, such contracts are a rare occurrence in the cement market.

that deviation will be detected quickly as some of the customers may inform their existing supplier that they have been approached by a competitor.

(b) If, on the other hand, there are some very large customers, this will make demand for cement lumpier. Inducing one of these large customers to switch may be sufficient to generate high one-off gains from deviation.

8.187 We analysed the concentration in the customer base for bulk cement (see paragraph 7.26 and Appendix 7.9). We found that, if the Majors' own RMX businesses were included, the customer base was highly concentrated: the Majors account between them for around 60 per cent of all bulk cement purchases. However, if the Majors are excluded, the largest independent customers do not individually account for a large proportion of purchases of cement ([redacted] per cent for the largest, [redacted]).

8.188 The largest customers would be likely to have many different sites purchasing cement. Cement-purchasing arrangements for those sites would depend on geographical considerations. Therefore, whilst such large customers might change suppliers for some of their sites, we considered it unlikely that a deviator would be able to capture all of the demand of a large multi-site operator as it was unlikely that the deviator's cement plants and depots would be well placed to serve all of a large customer's sites at a lower price than all other rival suppliers.

8.189 The customer base for bagged cement shows a higher degree of concentration than the customer base for bulk cement (see paragraph 7.28 and Appendix 7.9) and bagged cement customers tend to have longer-term contracts, typically in excess of one year.

8.190 We concluded that, because any deviations from the coordinated outcome were likely to take place by targeting individual customers of competitors, and because,

apart from the Majors themselves, most cement customers did not account for a large proportion of purchases of cement, the potential gains from one-off deviations would be relatively limited.<sup>174</sup> We also noted that the larger the customers targeted by the deviator (in order to maximize any gains from deviation), the faster any such deviation was likely to be detected by competitors, as GB cement producers were likely to monitor closely their largest customers (see paragraph 8.168).

- *Punishment/deterrent strategies*

8.191 In order for coordination to be sustainable, cement producers must lack an incentive to deviate from the coordinated outcome, because of the expected reaction from others to such deviation. There must therefore be a mechanism by which the profits of the deviator are reduced once a deviation has been detected. There is a relationship between the type and strength of punishment required and the type and strength of deviation strategies: the higher the potential profits from deviation, the larger the cost to the deviator needs to be in a punishment period to provide sufficient disincentive to prevent further deviations from occurring.

8.192 Given that prices are individually negotiated with customers in the GB cement markets (see paragraph 7.148), and that deviations are more likely to occur at a relatively small scale by approaching individual customers of other cement suppliers (see paragraphs 8.185 to 8.190), a tit-for-tat strategy of punishment would be sufficient to deter deviations in many cases.

- *Tit-for-tat strategies*

8.193 A tit-for-tat strategy consists of:

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<sup>174</sup> This does not necessarily mean that deviation by targeting of individual customers of competitors is rare. We saw some evidence of a degree of switching of customers between GB cement producers, and such switching was higher at some times than at others. As set out in paragraph 8.176, such switching is compatible with coordination.

(a) Deviation: Firm A deviates by gaining X tonnes from Firm B, by setting low prices to one or several of Firm B's customers in period t.

(b) Retaliation: Firm B retaliates by setting low prices to Firm A's customers, gaining Y tonnes from Firm A in the subsequent period(s).

8.194 Tit-for-tat strategies may not work if a deviator can capture a very large share of the market in the period of deviation. However, in the cement market where deviations are likely to be relatively small-scale in most cases (see paragraphs 8.185 to 8.190), retaliation based on regaining the equivalent volume from the deviator would be likely to be sufficient to prevent deviations:

(a) As a result of the deviation, the deviator gets additional profits through increased volumes though at lower margins than on previous sales (because of the need to reduce price in order to attract customers from competitors).

(b) In subsequent periods, the deviator's total volume of sales will go back to the coordinated levels (or reduce if the punishment exceeds the deviation), but margins will be lower.

8.195 Therefore, if any additional profit from deviations can be reduced by equivalent action in subsequent periods by competitors, profits from deviation are likely to be short-lived (and deviation would be likely ultimately to result in loss of profits in the longer term).

8.196 The internal documentary evidence we reviewed, including internal documents relating to the 2009 internalization event (see paragraphs 7.204 to 7.212), provided direct evidence of Cemex, Hanson and Lafarge reacting to the loss of a customer to one of their number by targeting customers<sup>175</sup> from the same cement supplier in order to

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<sup>175</sup> We noted that, as a result of bagged cement customers tending to have longer-term contracts than bulk customers (see paragraph 8.189), punishment via targeting of bagged cement customers might not be as immediate as in the case of bulk

regain share in response (tit-for-tat behaviour). Our review of internal documents also showed that the expectation of retaliation through this mechanism was sometimes taken into consideration by Cemex, Hanson and Lafarge in their sales decisions.

8.197 The Majors told us that the internalization event in 2009 was a 'one-off' event, which happened at a time of an unprecedented fall in demand. Hanson told us that it was representative of a common trend across the industry as the industry moved expressly in favour of independence in self-supply, in preference to reliance on each other and any interdependence. We agree that the 2009 internalization event was a one-off situation and could be thought of as a large 'shock' to the cement industry. We were therefore interested in analysing how cement suppliers had responded to this shock, and what it revealed about the way in which competition might operate in the cement market.

8.198 Hanson told us that the internalization was evidence that there was no coordination between cement producers, since the move to self-supply by Hanson to maximize its profits was a unilateral decision by Hanson and was a long-planned move going back to the time of (and preparation for) the Heidelberg acquisition of Hanson. Hanson told us that the analysis showed that Hanson had failed to foresee the extent of Lafarge's reaction to this decision. Hanson also told us that its losses to Lafarge at this time were proof that Hanson was not prepared to hold market share at any price although Hanson expected to win an increase of some [X] per cent of market share from its internalization. We agreed that Hanson's decision to move to self-supply was a unilateral decision. However, we did not think that this was incompatible with coordination: rather, our review of the evidence suggested that Hanson's unilateral decision to internalize resulted in a breakdown between Lafarge and Hanson. This appeared to have triggered a retaliation by Lafarge in terms of recouping market

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cement customers. However, we also noted that Lafarge successfully gained bagged cement customers (representing large volumes of cement) from Hanson as part of its response to Hanson's 2009 internalization.

share from Hanson, and unusual amounts of competition in the cement market (shown both by the unusual amount of switching at the time and the fact that prices somewhat reduced after Q1 2009). We considered that the internalization event, whilst unique, revealed information on the behaviours of cement producers and in particular on the way in which Lafarge targeted Hanson's customers to achieve stability of market shares despite this large shock.

8.199 Our analysis of the changes in monthly shares over time (see paragraphs 7.162 to 7.164) and our analysis of the correlation in monthly wins and losses between suppliers were also consistent with tit-for-tat behaviour. We found statistically significant negative correlation coefficients in own share of sales changes for the three largest GB cement producers (the Top 3) from one period to the next when looking at the correlation between changes in market share in one month and changes in market shares in the following two months.<sup>176</sup> This suggested that, if the share of one GB producer reduced in one month, it would increase by a similar amount in the following two months. This was consistent with the existence of a mechanism to rebalance market shares through matching of wins and losses. As set out in paragraph 7.157, our analysis of the correlation in monthly wins and losses of cement suppliers found some positive and statistically significant correlations of wins and losses among the Top 3 suppliers and, to some extent, [X] and [X]. This, again, was consistent with GB cement producers often reacting to the loss of a customer to another cement producer by targeting customers of that same cement producer, ie tit-for-tat behaviour.<sup>177</sup>

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<sup>176</sup> We also found statistically significant negative correlation coefficients for two of the GB producers ([X]) when looking at changes in market shares in one month and changes in market share in the following month; for [X] and [X], the coefficients were negative but not statistically significant.

<sup>177</sup> Cemex noted that some correlation between wins and losses was to be expected in a market with only four large suppliers, since, when a supplier sought to recover lost volumes, it would occasionally get those volumes from the Major to which it had lost volumes. We agree that this could be the case in theory; however, if the recovery of lost volumes were random, we would expect to see no consistent relationship between the timing of wins and losses between a pair of suppliers (ie we would expect correlation coefficients not to be statistically different from zero). Aggregate Industries noted that we had not controlled for other

8.200 Hanson told us that the observation of negatively-correlated changes in monthly market shares could not be interpreted as evidence of a tit-for-tat strategy as a matter of economic theory. It argued that, under a coordinated effects theory of harm, the aim of tit-for-tat strategies was to provide a threat to prevent deviations, which would only be used when perceived coordination had broken down. Hanson argued that, as a matter of theory, if tit-for-tat behaviour were observed on a continuous basis (as indicated by negatively correlated changes in monthly market shares), this showed that the perceived coordination was always breaking down. Hanson told us that the approaches in practice, for example, by Hanson and by Cemex to their mutual customers, were so constant and common across the whole of the review period, that such actions could not properly be classified as intermittent tit-for-tat competition/deviation punishments, but rather constituted ongoing continuous competition to secure business from buyers. We disagreed with Hanson. As set out in paragraph 8.218, tit-for-tat strategies can be used both as a mechanism to re-balance shares on a short-term basis, as well as a mechanism to deter deviations (or to punish deviations when these have occurred). In addition, for the reasons set out in paragraph 8.176, a degree of competition is not incompatible with coordination.

8.201 Cemex told us that the reason for any observed rebalancing of market shares and tit-for-tat behaviour was that GB cement producers would compete hard to recover volumes that had been recently lost, and that this was pro-competitive. Whilst we accepted that, in a competitive market, firms would compete to recover volumes when they had experienced a loss, we would not expect firms in a competitive market (where these firms have significant excess capacity) only to compete to gain volumes when they had lost share. In addition, in a competitive market, we would expect firms which had lost volumes to attempt to gain back volumes from the market as a whole,

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factors that could result in correlation but not be related to tit-for-tat behaviour, such as plant closures or differences between customer types. We agree that we did not control for these other factors. However, we had direct evidence of tit-for-tat behaviour occurring through internal documents, and our statistical analysis confirmed this.

rather than mainly targeting customers of the producer which won the volumes from them. Such competitive behaviour would therefore result in less stable market shares than we observed: ongoing competition to gain volumes generally as well as producers seeking to recover any lost volumes from all other producers in the market would generate larger instability in market shares and make balancing of market shares over time unlikely. Similarly, Cemex also told us that the positive correlation in wins and losses that we found between the Top 3 suppliers was to be expected in a market with a small number of players: according to Cemex, when a producer lost share, it would seek to recoup share. Cemex told us that, because of the small number of players in the market, this would result in correlation in wins and losses. We noted, however, that our review of internal documents showed direct evidence of intentional tit-for-tat behaviour (see paragraphs 8.69 to 8.73 and 8.115 to 8.139). Moreover, as explained above, competition to gain volumes generally, alongside competition to recover lost share from the market as a whole, would be likely to result in much larger volatility in market shares over time.

8.202 The vertical integration of cement producers into downstream operations (including RMX) provides further opportunities to impose costs on any deviator that is also vertically integrated into downstream operations, for example through changes in the amount or terms of cross-sales, where these exist.

- *Changes in the amount or terms of cross-sales*

8.203 As set out in paragraph 7.202, there have been large changes in the extent of cross-sales between the Majors over time, with large reductions since 2009. We also found that some of the changes in cross-sales had been defensive: for instance, in 2009, when Hanson internalized purchases from Lafarge, Lafarge reacted by internalizing its own purchases as well as increasing sales to [REDACTED] and [REDACTED] (see paragraphs 7.204

to 7.212).<sup>178</sup> This suggested to us that changes in the amount or terms of cross-sales could be used as a retaliation mechanism, although we acknowledged that the scope for large-scale retaliation via this route was much smaller now than in the past, as a result of the decline in cross-sales.

8.204 We also found some evidence in the Majors' internal documents of changes in cross-sales being used as a mechanism to signal to a potential competitor that a deviation had been detected:

- (a) In an internal Lafarge email, dated 2007, in response to Cemex repatriating volumes from Lafarge, [Lafarge Senior Cement Executive] suggests stopping Lafarge sales of cement to Cemex 'in the far SW, stating that we are short of material, and do it urgently. This might bring them to the table'.
- (b) In an internal Cemex email dated 2008, [Cemex Senior Cement Executive] says that Lafarge is going to repatriate [X] for its RMX plants in the [X] and writes: 'LF cement feel we [Cemex] have been aggressive against them in the market. I pointed out to him that year-to-date they have taken around [X] of business from us.... Following this news I have asked [Cemex Senior Executive] to move the CX [Cemex] mortar plants in [X] to CX [Cemex] cement supply....'.
- (c) We see another example of Cemex internalizing volumes from Lafarge in response to Lafarge having gained two large customers from Cemex ([X] and [X]) in an email from [Cemex Senior Cement Executive] to [Cemex Cement Employee], dated September 2005, in which [Cemex Senior Cement Executive] writes: '...we should look to take back ALL the volume we are going to lose to Lafarge as a result of the [X] and [X] aggression as soon as possible (ie now, before we lose it). ... This will give a temporary increase in market share which

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<sup>178</sup> We also noted, in our study of the Hanson internalization, that the pricing of cross-sales may also be used as a mechanism to retaliate against deviations. The correspondence between Lafarge and Hanson showed that one of the strategies of Lafarge in reaction to the proposed internalization by Hanson was to attempt to increase the prices charged to Hanson (which Lafarge Tarmac told us was to reflect the decrease in the volume supplied by Lafarge to Hanson) and to withhold end-of-year rebate payments.

will hopefully cover some of the loss of cement volumes we are seeing through the RMX sector. Please can you arrange for the outstanding volume to be taken off Lafarge this week and make sure that all parties know why the change is taking place.'

- (d) In an internal Lafarge email dated 18 June 2010 [Lafarge Senior Cement Executive] writes that: 'We're getting reports back from customers, including [redacted], that Hanson are preparing to take some action in the Market in response to our impending Cem III launch. **We should probably expect Hanson to take SW plants back in-house.**' (Emphasis added.) This email suggests Lafarge anticipates Hanson retaliating to Lafarge launching a CEM III product (which would be a threat to GGBS-based blends) by repatriating volumes in house.
- (e) In an email exchange from June 2012 titled [redacted] [Company X Senior Cement Executive] writes to [Company X Senior Cement Executive]: 'Nope we are committed to **maintain our share** ... my question is, is this the best quality share we can get? If the answer is yes then we keep it until we can get something better in [redacted]. We will see May market share figures [presumably, MPA] end of this week ... that may also help us to decide.' (Emphasis added.) [redacted] responds: 'Ok let's see what number we get. We now have better quality market share in [redacted] by going internal and ditching [redacted]% but the attacks by [redacted] has put a big dampener on that plan. I think we should take [Company Y] supplied plants off them in [redacted] and let [redacted] go'. This suggests that [Company X] is contemplating repatriating plants from [Company Y], but in exchange letting a customer [redacted] go.

- *Other punishment mechanisms*

8.205 We noted that the multi-market contact between the Majors (for example, in GGBS, aggregates and RMX, and in international cement markets) created other opportunities for punishing deviations from the coordinated outcome in the GB cement markets. However, for coordination to be internally sustainable, it is sufficient for

there to be one effective punishment mechanism (in this case, tit-for-tat strategies). We did not therefore explore these other punishment possibilities in more detail, with the exception of incentives to deviate and ability to punish in RMX markets (see Appendix 8.5).

- *Accidental punishment and/or erosion of prices*

8.206 The amount of information available to firms may not be perfect, and there is a risk that incorrect or accidental punishment make take place when no deviation has actually occurred. This may generate instability in coordination. Given the amount of information available to firms on their monthly share of GB production (see paragraph 8.166) and the feasibility of monitoring customer switching (see paragraph 8.168), as well as the presence of vertically-integrated firms in downstream markets for cement (which enables the gathering of information on downstream demand conditions—see paragraph 8.168), we considered such risks to be low.<sup>179</sup> In particular, by monitoring both share of production and switching, the GB producers will in most cases be able to distinguish, when they have experienced a reduction in their monthly production share, whether this is due to a loss of customers to other members of the coordinating group (ie a deviation requiring action), whether it is due to loss of customers to fringe players, or whether it is due to their own customers not performing well in downstream markets.

- *Conclusions on internal sustainability of coordination*

8.207 We concluded that it was likely that coordination in the GB cement markets on the basis of shares of sales was internally sustainable, given the low gains from devia-

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<sup>179</sup> Cemex told us that the risks of accidental punishment would be high as a result of large cement customers multi-sourcing cement for their different job sites. Cemex argued that, in reducing prices to a single job site to punish the existing supplier to that job site, the punishing cement supplier would run the risk that the customer might demand a similar price at its other job sites from either its existing supplier to those sites or another supplier. We first noted that the large majority of bulk cement customers have only one job site (around 600 out of the 900 customers—see Appendix 7.9). In addition, for customers with several job sites, the existence of different transport costs would make price comparisons more difficult across job sites located in different areas, and producers could use this—and other differentiating factors—to resist price reductions at other job sites.

tion, the existence of effective deterrent mechanisms and the low risk of incorrect or accidental punishment.

### *External stability*

8.208 The Guidelines state<sup>180</sup> that the external sustainability of coordination may be:

- (a) facilitated by barriers to entry or expansion;
- (b) affected by the number, size, cost and profit margins and output expansion capability of non-coordinating firms (the competitive fringe) in the market—in particular the existence of a ‘maverick’ (ie a firm that has capacity to take significant share from the coordinating group of firms, but has substantially different incentives from the firms in that group); and
- (c) undermined by countervailing buyer power of customers.

- *Barriers to entry and expansion*

8.209 We found that there were significant barriers to entry into GB cement production, whether by setting up a new cement plant or by setting up a new grinding mill (see paragraphs 7.50 and 7.52 to 7.54). Whilst we found that there would be few barriers to expanding GB cement production within the current capacity constraints of the existing GB cement plants and grinding mills (see paragraphs 7.51 and 7.55), all these cement plants and grinding mills are owned by the existing GB cement producers.

- *The competitive fringe*

8.210 We compare Tarmac’s incentives with the incentives of the other GB producers in paragraphs 8.252 to 8.256, noting in particular Tarmac’s capacity constraints and high degree of vertical integration into downstream operations (including RMX).

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<sup>180</sup> The Guidelines, [paragraph 255](#).

8.211 The other source of cement supplied in GB, other than the cement which is produced in GB, is cement imported into GB.<sup>181</sup> In paragraph 7.105, we found that, while there is evidence that the GB producers regard imported cement as a competitive threat, the strength of the competitive constraint from imported cement (and thus the ability of cement importers to undermine coordination) was limited because:

- (a) the GB cement producers had a substantial cost advantage over cement importers in competing for customers at the margins;<sup>182</sup>
- (b) the higher costs faced by cement importers created incentives for them to price their cement just below the price of GB produced cement;<sup>183</sup> and
- (c) the GB cement producers considered, and in some cases took, specific steps to undermine the viability of imported cement, such as applying pressure to restrict cement supplies to independent importers, purchasing of import terminals and/or importers, leveraging of contacts with importers in other markets and targeting lower-priced cement selectively at customers of cement importers.<sup>184</sup>

8.212 We also found that the high degree of vertical integration by the GB cement producers created a barrier to entry and expansion for independent cement importers (see paragraph 7.78).

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<sup>181</sup> Hanson told us that some of the importers were part of non-GB cement producer groups and that it was therefore misleading to categorize them as being part of a competitive fringe, as they were often publicly listed multinational corporations that were vertically-integrated cement majors in their own right, with, according to Hanson, limitless cement capacity and with turnovers exceeding the entire combined Heidelberg/Hanson international group. However, we noted that none of these importers had facilities to produce cement in GB, and that the same cost disadvantages applied to these importers as to other independent importers.

<sup>182</sup> We consider that cement imports into GB take place despite the cost disadvantages faced by importers because it would not be a profit-maximizing strategy for the GB producers to price all imports out of the market (although, as noted in paragraph 7.90, this would not necessarily preclude the GB producers taking action to price a particular importer out of the market).

<sup>183</sup> Cemex told us that our argument assumed that the independent importers took part in a tacit agreement with the GB cement producers. We disagreed: we considered that it was in the individual interests of GB cement importers to adopt such pricing behaviour to maximize profits, given their higher cost base and the risk as a consequence that they could be priced out of the market if they significantly undercut the GB cement producers.

<sup>184</sup> Hanson told us that we had referred to evidence of Hanson competing for its competitors' customers as 'tit-for-tat' behaviour (in the case of GB cement producers' customers) and exclusionary behaviour (in the case of importers). Hanson considered that this was inconsistent and that the obvious and most simple explanation was that both 'types' of competitive activity were consistent with normal competition.. We address this argument in the third footnote to paragraph 8.218(f).

- *Countervailing buyer power*

8.213 If certain buyers possess buyer power, they may be able to limit the ability of GB cement producers to raise prices.

8.214 There was some evidence (see Appendix 7.5) of large customers ([redacted] and [redacted])<sup>185</sup> obtaining particularly favourable terms for cement supplies, particularly if they were able credibly to threaten to import large additional quantities of cement instead. Such customers may obtain prices that are lower than other customers, although this may still be higher than the price that would prevail in a market in which there was effective competition.

8.215 Because cement prices are individually negotiated (see paragraph 7.148) and show dispersion (see paragraph 7.152) (ie there is price discrimination), even if some buyers can exert a degree of buyer power, this is unlikely to undermine the ability of GB cement producers as a whole to coordinate on sales of cement to other buyers. Only a modest proportion of total cement sales may be (to an extent) protected from the effects of coordination by buyer power (see paragraph 8.187).

- *Conclusions on external sustainability of coordination*

8.216 We concluded that it was likely that coordination in the GB cement markets on the basis of shares of sales was externally sustainable, given the high barriers to entry, the limited (although variable over time) constraint from imported cement and non-coordinating firms more generally, and the limited impact of countervailing buyer power.

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<sup>185</sup> It is also possible that large bagged cement customers may be able to negotiate more favourable terms than other customers.

*Conclusions on the conditions for coordination*

8.217 We concluded that, although the extent to which they were satisfied might vary over time, the conditions for coordination to be sustained were met, in relation to the ability to reach and monitor coordination, the existence of a mechanism for internal sustainability and the external sustainability of coordination.

*Conclusions on the mechanism for coordination*

8.218 Based on the evidence and the analysis we carried out, we considered it likely that coordination in these markets takes place as follows:

- (a) coordination on shares of GB cement sales made by the GB cement producers<sup>186</sup> as well as on customer allocations between Lafarge, Cemex and Hanson, with no coordination directly on prices as these are individually negotiated;
- (b) signalling of desired direction of prices of cement through price announcement letters (which facilitates price leadership and price following, and softens customer resistance to price increases); with Lafarge often acting as the leader in setting the levels of announced price increases;<sup>187</sup>
- (c) potential signalling of the desired level of prices for cement through members of the coordinating group accepting higher prices for cross-sales than might otherwise be the case<sup>188</sup> (thereby signalling that the prices they charge to their own downstream operations, and to their customers, are also high—otherwise they would not be willing to pay high prices to other cement suppliers);
- (d) tit-for-tat strategies (see below), as well as the existence of cross-sales, provide opportunities for re-establishing shares of sales when these have changed (eg in

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<sup>186</sup> Cement sales in this context means overall sales of cement, including both bagged and bulk cement and different types of cement (CEM I, CEM II etc). Although we consider bulk and bagged cement to be in different product markets due to the lack of demand-side substitution between them, from the production point of view they are largely interchangeable. With respect to GGBS, we note that, even if GGBS is not the core product on which coordination may take place, retaliation in the event of deviation could encompass GGBS. There is evidence of this occurring in practice, such as during the 2009 internalization. In addition, it is possible that the threat of Lafarge or Cemex importing GGBS to sell to independent customers may also be an additional mechanism to prevent Hanson from deviating in cement.

<sup>187</sup> See, for example, Appendix 8.2, paragraphs 34, 176, 216 & 243.

<sup>188</sup> See Appendix 8.2, paragraph 268.

the case of cross-sales, if Producer A's share has increased compared with B, it then increases volumes of cement purchased from B);

- (e) monitoring of adherence to the coordinated outcome through each member of the coordinating group monitoring its own share on a monthly basis, using information from the MPA supplemented by monitoring of customers won and lost and from whom they were won/lost, and also using information on prices of cement gathered from cement customers and through cross-sales;<sup>189</sup> and
- (f) prevention of deviation: given that prices are individually negotiated, any deviations from coordination are most likely to take place by a firm approaching individual customers of other members of the coordinating group with low cement prices in order to induce these customers to switch.<sup>190</sup> Such attempts at deviation could be punished through the following mechanisms:
- (i) *Tit for tat*. If Firm A loses share to Firm B, Firm A will regain at least the equivalent volume from Firm B.<sup>191</sup> This will quickly result in unchanged shares of sales but lower average prices (because of the need to offer lower prices to induce customers to switch), and therefore may cancel out benefits from deviations obtained by Firm A.<sup>192</sup>
- (ii) *Internalization*. Although not necessarily a credible punishment mechanism in all cases and at all times over the past five years (because of varying and declining levels of cross-sales), small-scale internalization may be sufficient

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<sup>189</sup> A number of internal documents indicate a close monitoring of GB producers' own share. See, for example, Appendix 8.2, paragraphs 11, 136, 212 & 261. See, for example, Cemex 'Cement Commercial Updates' in Appendix 8.3, paragraphs 277 & 278, 324, 358, 363. See, for example, Appendix 8.3, paragraphs 38, 44 & 394/395 in relation to Hanson and Appendix 8.3, paragraph 357 in relation to Lafarge. The documents show that customers and volumes won/lost are monitored: See, for example, Appendix 8.2, paragraphs 44 & 45, 54, 136, 154, 261 & 265. See, for example, Cemex 'Cement Commercial Updates' in Appendix 8.3, paragraphs 324, 358 & 363. See, for example, Appendix 8.3, paragraphs 209, 284/5, 294/295 & 396 in relation to Hanson and paragraph 103 in relation to Lafarge. There are many examples of information on the prices of other GB cement producers being obtained from customers or via cross-sales. See, for example, Appendix 8.2, paragraphs 38, 202 & 210. See, for example, Appendix 8.3, paragraphs 170, 172, 200, 236 & 245.

<sup>190</sup> The existence of a degree of such switching is compatible with coordination for the reasons set out in paragraph 8.176.

<sup>191</sup> See, for example, Appendix 8.2, paragraphs 46, 52 & 59. See, for example, Appendix 8.3, paragraphs 49/50, 209/210, 250-252, 284-286, 335, 343 & 418/419.

<sup>192</sup> Lafarge argued that, since it sought to regain lost volumes from Tarmac and importers as well as from Cemex and Hanson, such tit-for-tat behaviour was part of a competitive strategy rather than being evidence of coordination. However, the same behaviour is capable of serving more than one purpose. When directed at other members of the coordinating group, it deters deviation whereas, if directed by members of the coordinating group at the competitive fringe, it deters further expansion by the competitive fringe where this might otherwise take place (ie in the case of cement importers). We considered that there are important differences in the incentives of Tarmac (which is, for example, capacity constrained) and the cement importers (which, for example, face cost disadvantages compared with GB-produced cement) which mean that they may not adopt equivalent tit-for-tat strategies and are not part of the coordinating group.

for Firm A to signal to Firm B that an attempt at deviating has been detected (if Firm A purchases some cement from Firm B).<sup>193</sup> If Firm A does not purchase cement from Firm B but sells cement to Firm B, another mechanism to signal that a deviation has been detected would be for Firm A to increase cement prices to Firm B, or to renegotiate any rebates that might be in place.

(iii) *Other possible punishment mechanisms.* The extensive multi-market contact of the GB cement producers (for example, in GGBS, aggregates, RMX and asphalt) provide further opportunities for punishing deviations.<sup>194</sup>

8.219 We also considered that vertical integration of the GB cement producers into downstream operations (and RMX production in particular) was likely to be an important factor in the mechanism for coordination identified above, for the following reasons (see also Appendix 8.5):

- (a) It is likely to act as a barrier to entry and expansion into the cement market by fringe players (see paragraph 7.78).
- (b) It increases considerably the amount of transparency in the market, in particular because it provides the opportunity and logistical justification for cross-sales of cement between the GB cement producers (thereby increasing price transparency, both through price announcement letters and through the level of the price that is agreed). It also increases transparency through providing better information on downstream demand conditions.
- (c) The existence of cross-sales provides a means for GB cement producers to re-balance shares of sales (by increasing or reducing cross-sales when necessary) and to signal that deviations have been detected through small-scale internalization or changes in the terms of cross-sales.

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<sup>193</sup> See, for example, Appendix 8.2, paragraphs 42 & 154. See, for example, Appendix 8.3, paragraph 369.

<sup>194</sup> For example, in response to Hanson's 2009 internalization, Lafarge internalized its own purchases from Hanson, of which some were GGBS purchases switched to PFA—see paragraph 7.206(a). See also Appendix 8.3, paragraph 17, in which Hanson anticipates retaliation on GGBS for actions on packed cement.

8.220 Whilst there is, in our view, direct evidence of many aspects of this mechanism for coordination taking place (for example, tit-for-tat retaliation and monitoring of shares), there is less direct evidence for some other aspects (for example, cross-sales being used to re-establish shares of sales when these changed). However, in relation to these latter aspects of the mechanism for coordination, we have found evidence that there are opportunities for the members of the coordinating group to behave in the way we have suggested. We think it unrealistic to expect to obtain direct evidence as to whether or not these opportunities are in fact exploited, given the nature of the behaviour concerned and our inevitable lack of complete information about the markets we are investigating.

8.221 Some aspects of this mechanism for coordination (such as the scope for transparency and punishment of deviation through cross-sales) may not have been in operation for all of the last five years as a result of significant changes in the market during this period. However, we do not consider that this variability in some of the detailed aspects of the mechanism for coordination is sufficient to undermine the mechanism as a whole. For example, even in the absence of cross-sales, tit-for-tat punishment of deviation would, in our view, still be sufficient to maintain the internal stability of the coordination.

8.222 Hanson argued that an academic paper<sup>195</sup> had pointed out that coordination on market shares was unlikely to be successful unless complemented with side payments between coordinators. We first noted that a well-established mechanism for rebalancing shares of sales among the coordinators would be likely to eliminate the need for side payments. As set out above, in this case, tit-for-tat strategies and cross-sales can be used to rebalance market shares, and are therefore likely to

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<sup>195</sup> Hanson quoted Harrington and Skrzypacs: 'Private monitoring and communication in cartels: explaining recent collusive practices', *American Economic Review*, 2011.

eliminate the need for side payments. We also noted that the article quoted by Hanson did not find that side payments were a necessary condition for coordination on market shares: rather, it found that, in an environment where neither prices nor quantities were observable,<sup>196</sup> and therefore where coordination would be unlikely in most models, side payments could be a mechanism to make coordination on prices sustainable.

### *Variation over time in the evidence base*

8.223 During the period of time covered by the evidence and our analysis (which, in the later case, was largely the period since 2007), there has been variation in aspects of the cement markets that are relevant to our assessment of coordination. Not unexpectedly, our direct and indirect evidence indicates differences in the extent or success of coordination at different times within this period.

8.224 In this subsection, we examine the key developments in the GB cement markets since 2007, which we consider important context for our assessment of the evidence, and compare the timing of these developments with trends in the evidence base and in the results of our analysis. Our aim was to understand whether and how changes in market conditions might have affected the incentives and ability of firms to coordinate over this period, and what this might indicate for our competitive assessment overall.

8.225 The key developments in the GB cement markets since 2007 that we considered were of sufficient scale that they might have had a readily observable impact on the coordination in those markets included:

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<sup>196</sup> We note that this is not the environment in which the GB cement markets operate, in that (among other sources of transparency) total GB cement sales and own market shares are observable on a monthly basis through the publication of MPA data.

- (a) a 36 per cent decline in cement sales in GB over the period 2007 to 2009, with only limited recovery in demand since 2009 (see paragraph 2.53);
- (b) a [REDACTED] per cent reduction in GB clinker production capacity from 2007 to 2011. The only significant increase in cement capacity over this period was made by Tarmac, which increased capacity at its Tunstead plant in April 2008 from [REDACTED] nameplate capacity to [REDACTED] nameplate capacity (see paragraph 7.17);
- (c) the acquisition in late 2007 of Hanson (predominantly an aggregates and RMX/ concrete block producer with no cement production) by Heidelberg (the owner of Castle Cement since 1998), giving Hanson cement production capacity in GB. In early 2009, as a result of this acquisition, Hanson internalized most of its cement purchases (see paragraph 7.205);
- (d) significant changes in the extent of the Majors' internal consumption of cement. These changes seem to be linked mainly to a large internalization of cement purchases by Hanson in 2009 and to Tarmac's increasing cement production capacity (see Appendix 2.3);
- (e) as described in paragraph 1.11, in December 2010, DG COMP announced that it had opened an investigation into suspected anti-competitive practices by several manufacturers of cement and related products in various European countries including the UK. [REDACTED]; and
- (f) the formation of Lafarge Tarmac and HCM in January 2013 (see paragraph 1.18). However, this development is too recent to observe any resulting effects in the evidence available to us.

8.226 For the period since 2007, we observed the following main variations over time in our evidence and the results of our analysis:

- (a) The GB cement markets have remained highly concentrated, although Lafarge (and to a lesser extent Hanson and Cemex) has lost small amounts of market share to Tarmac and importers between 2007 and 2011 (see paragraph 7.8). We

observed that Lafarge lost five percentage points of market share from 2008 to 2009, although it subsequently recovered some of this share.

- (b) The GB cement producers' variable profit margins have remained relatively stable, in particular the 2008/09 demand slump did not have a negative impact on these margins (see paragraph 7.146).
- (c) Profitability based on the continuing costs of supply (economic profitability) exceeded the cost of capital throughout the period of review despite the slump in demand and the fact that this profitability measure was not adjusted for the higher operating costs undoubtedly associated with some older and less well-located plant. We did, however, observe that all the GB cement producers experienced a dip in economic profitability in 2008 and/or 2009.
- (d) In broad terms, there was higher price dispersion for bulk cement in 2009 (particularly during Q1 2009) for Lafarge, Cemex and Hanson than in surrounding time periods. For [redacted] and [redacted], there was also higher price dispersion in 2011 (see paragraph 7.152).
- (e) The end of 2008 and all of 2009 were periods with relatively high levels of customer switching (see paragraph 7.157).
- (f) Customers switching from 2009 onwards achieved lower prices after switching on average, whereas this was not the case before 2009 (see paragraph 7.158).
- (g) The period prior to Q1 2009 was a period with large increases in average realized prices of cement—this was less the case after Q1 2009. In particular, announced price increases were realized more successfully for the multiple price increases in 2008 than in the following years (see paragraph 7.181).
- (h) Whilst the January price increase announcements for 2007, 2008, 2009 and 2011 were led by Lafarge, the January price increase announcements for 2010 were led by Tarmac and Hanson, with Cemex and then Lafarge announcing price increases afterwards, and with their increases not effective until March 2010. In

addition, the January price increase announcements for 2012 were led by Cemex.

- (j) There was a shift over the period as a whole towards greater self-supply and lower levels of cross-sales between the Majors, apart from in areas where logistics implied that purchases from other Majors might be more economical (see paragraph 7.202).

8.227 We did not consider that the declines in Lafarge's (and, to a lesser extent, Cemex's and Hanson's) market shares, and the growth in Tarmac's and importers' market shares, from 2007 to 2011 were indicative of a breakdown in coordination in the GB cement markets. Rather, these changes reflected the different roles of the market participants (see paragraphs 8.246 to 8.256). Nevertheless, we found that there were some indications that 2009 was a period of time when coordination in the GB cement markets might have been less successful, possibly as a result of a large internalization of cement purchases by one of the Majors at that time and/or the significant slump in demand in 2008/09. These indications included:

- the sudden reduction in Lafarge's market share from 2008 to 2009 (subsequently partially recovered);
- the dip in economic profitability experienced by all GB producers in 2008 and/or 2009;
- higher price dispersion; and
- higher levels of customer switching.

8.228 The year 2009 also appears to have marked a boundary between the pre-2009 period when the GB producers were able to achieve large increases in average prices of cement and the subsequent period when they were not.<sup>197</sup> However, these

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<sup>197</sup> The lack of Lafarge leadership of the January price increase announcements in 2010 and 2012 was notable. However, as we did not consider that the price increase announcement letters were the focal point for coordination, we did not consider that

changes do not appear to have had any lasting impact on the GB cement producers' returns or variable profit margins.

8.229 The internal documents are consistent with a view that the balance between coordinated and competitive behaviour has not remained constant. They also show that attempts to achieve coordinated outcomes are not always wholly successful. The 2008 documents more clearly demonstrate Lafarge, Hanson and Cemex adapting their behaviour to achieve coordinated outcomes. The 2012 documents include many examples of price competition between cement producers.<sup>198</sup> In relation to this last observation, as noted in paragraph 8.36, the 2008 documents are a selected set of documents, [redacted].

8.230 The trends that we observe in coordination, the balance between coordinated behaviour and competition, and the changes in economic and market context indicate that coordination in cement is not constant and unchanging but that it is influenced by external conditions. It also appears that attempts to reach coordinated outcomes have been more and less successful at different times. These conclusions are broadly in line with what we would expect where there is coordination in a market that is subject to the variations that we have observed since, in particular, 2007. However, we did not find evidence that there were intervals of time during this period when there was no coordination in the GB cement markets, and our observation of variation in the extent of coordination over time did not eliminate our concerns about coordination in these markets.

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the lack of Lafarge leadership of these two price increase announcement rounds indicated any material breakdown in coordination at those points in time.

<sup>198</sup> As set out in paragraph 8.176, some competition between GB suppliers is compatible with coordination.

## *Incentives to coordinate*

- 8.231 We analysed the incentives of the GB producers to adhere to the mechanism of coordination described in paragraph 8.218, as part of our overall assessment of coordination.
- 8.232 The incentive to coordinate in cement is likely to be high: cement is a relatively homogeneous product which can be transported over large distances. This lack of differentiation implies that competition between cement producers on prices could be strong and lead to low returns, particularly in times of excess capacity.
- 8.233 The incentive of each GB cement producer to adhere to coordination will depend on the size of its potential profits from deviating (less the costs to it from retaliation) compared with its profits from coordination. This balance is likely to vary for each producer depending on:
- (a) its relative efficiency;
  - (b) its overall market share;
  - (c) its spare capacity; and
  - (d) the extent of its vertical integration (and hence its need to sell cement externally, which we term its exposure to external market sales).
- 8.234 Our analysis of the cost structures of the GB cement producers (see paragraph 7.134) showed that these were broadly similar, particularly those of [X], [X] and [X]. We therefore do not consider further whether differences in efficiencies of the GB cement producers may adversely affect incentives to coordinate.<sup>199</sup>

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<sup>199</sup> Hanson told us that the EU ETS scheme introduced additional complexities in aligning strategies because cement producers earned revenues both from selling cement and from not selling cement (carbon credits). Our analysis (see Appendix 6.5) showed that it was more profitable for GB cement producers to produce cement than to sell carbon allowances. For this reason, we considered that the EU ETS scheme was unlikely to affect decisions on total GB cement production, although it might affect decisions on how this production was distributed across different cement plants. Therefore, we considered it was unlikely that the ETS would introduce sufficient additional complexity adversely to affect GB producers' incentives to coordinate.

8.235 However, there are asymmetries between the GB producers in terms of market share, amount of available spare capacity and degree of vertical integration. We analysed how these might affect their incentives to coordinate. Table 8.2 shows, for each cement producer in GB, its share of GB cement production, its total spare clinker capacity and its total internal sales and total external sales in 2011.

TABLE 8.2 **Capacity share, production share, internal/external sales split and spare capacity of the GB cement producers in 2011**

	<i>GB clinker capacity share %</i>	<i>GB production share 2011 %</i>	<i>Total internal sales 2011 tonnes</i>	<i>Total external sales 2011 tonnes</i>	<i>Spare clinker capacity in 2011 kt</i>	<i>Spare clinker capacity in % of total clinker capacity</i>
Lafarge	[40–45]	[40–45]	[ <del>3</del> ]	[ <del>3</del> ]	[ <del>3</del> ]	[20–25]
Hanson	[20–25]	[20–25]	[ <del>3</del> ]	[ <del>3</del> ]	[ <del>3</del> ]	[10–15]
Cemex	[20–25]	[20–25]	[ <del>3</del> ]	[ <del>3</del> ]	[ <del>3</del> ]	[5–10]—or [25–30] with mothballed kiln
Tarmac	[10–15]	[10–15]	[ <del>3</del> ]	[ <del>3</del> ]	[ <del>3</del> ]	[5–10]

Source: GB cement producers—all cement products including bagged and bulk. Tarmac sales to TBP counted within internal sales.

Note: For Tarmac, we use cement capacity figures as set out in Appendix 7.2.

8.236 We found that there were some differences between the GB cement producers in terms of their total share of capacity and of production, total spare capacity and the split of their sales between external and internal sales. In particular:

- (a) Lafarge is the largest cement producer in terms of capacity and production share, and is also the producer with the largest amount of spare capacity (both in absolute terms and as a proportion of its total clinker capacity). It is also the producer with the lowest level of internal cement sales, and with the highest exposure to external cement sales ([~~3~~] per cent of its sales are to external customers).
- (b) Hanson and Cemex are both medium-sized GB producers, and are very similar in terms of their share of capacity and production and their internal/external sales split (with internal sales of around [~~3~~] per cent of their total cement sales).
- (c) Tarmac is the smallest GB producer in terms of capacity and production share; it is also the producer with the lowest spare capacity (both in volumes and in percentage of its clinker capacity). Its internal cement sales, though lower in

absolute terms, are higher in relative terms than those of Hanson and Cemex and represent a significant majority of its sales ([redacted] per cent).

8.237 These asymmetries in capacity, market shares, degree of vertical integration and amount of spare capacity mean that different cement producers could be argued to have different incentives to coordinate.

*Effect on incentives to coordinate of asymmetries in market shares and capacity*

8.238 We considered whether market share asymmetries made coordination more difficult to achieve because a firm with a lower market share would have more to gain from a deviation (it would have a larger potential for an increase in sales if it deviated) and less to lose from retaliation (its profits from coordination would be lower with a smaller share, and therefore the difference between its profits from coordination and its profits following retaliation would be lower). However, this assumes that the smaller firm has equivalent capacity to the larger firm and is therefore able to capture a large part of the market if it deviates. In the case of the GB cement markets, the reason for the asymmetries in cement market shares is likely to be largely due to differences in production capacities.<sup>200</sup>

8.239 We note from Table 8.2 above that the GB producers' production shares are very similar to their capacity shares (although [redacted]). The incentives on Hanson and Cemex to deviate will therefore be limited by their total cement capacity, and are likely to be similar, in that respect, to the incentives of Lafarge. In other words, the fact that pro-

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<sup>200</sup> As set out in Ivaldi et al (2003), the question relevant to assessing the impact of asymmetries in market shares on coordination is why market shares are asymmetric, and how these factors affect coordination (see Ivaldi, Jullien, Rey, Seabright, Tirole, *The Economics of Tacit Collusion: Final report for DG Competition*, European Commission, March 2003: [http://ec.europa.eu/competition/mergers/studies\\_reports/the\\_economics\\_of\\_tacit\\_collusion\\_en.pdf](http://ec.europa.eu/competition/mergers/studies_reports/the_economics_of_tacit_collusion_en.pdf) ).

duction shares are aligned with capacity shares should minimize any asymmetries in the incentives to deviate between Lafarge, Hanson and Cemex.<sup>201</sup>

8.240 In addition, we noted the recent economic literature which emphasizes the role of leadership in facilitating coordination (see paragraph 8.13).

8.241 Therefore, we considered that the asymmetry in market shares and production capacity in the GB cement markets, which gives Lafarge a position as a market leader, was a factor which did not make coordination more difficult—and could facilitate coordination—in the GB cement markets. The leadership role of Lafarge is analysed further in paragraphs 8.246 and 8.247.

*Effect on incentives to coordinate of asymmetries in extent of vertical integration*

8.242 One of the effects of vertical integration is likely to be that sales to a cement producer's own downstream operations are more secure than sales to external customers: whereas external customers may switch suppliers in the event of a change in relative prices, internal sales are unlikely to respond to the same dynamics.

8.243 The following hypothetical example illustrates this difference between internal and external sales. If Firm A's costs of producing cement increase relative to Firm B, and as a consequence Firm A's cement prices increase relative to B, this will have the following effects on Firm A's sales:

- (a) External sales will be likely to reduce as some customers may switch to Firm B.
- (b) Firm A is unlikely to switch to Firm B for internal sales so internal volumes will remain with Firm A. There may be some reduction in internal volumes in so far as

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<sup>201</sup> Cemex told us that changes in the capacity in the market between 2007 and 2011 had increased asymmetry between the GB cement producers and therefore would have increased the difficulty in maintaining any coordinated outcome. We did not agree that the asymmetry between the Top 3 GB cement producers had increased between 2007 and 2011: as set out in Appendix 7.2, Cemex, Hanson and Lafarge each reduced cement capacity between 2007 and 2011.

the increase in the cost of cement to Firm A's RMX operations may result in it losing sales. However, this effect is likely to be much less pronounced and immediate than the effect on external cement sales, because cement is only one of the inputs into RMX. The final price of RMX depends on the cost of other inputs such as aggregates, so the overall increase in the RMX price as a result of the cement price increase will be lessened. In addition, RMX demand may depend on factors other than price—particularly location, given the local nature of RMX markets. Even if the price of Firm A's RMX increases relative to others, the impact on Firm A's volumes may not be strong because it will still be attractive to customers located close by.

8.244 It is therefore likely that the effect of an increase in the price of cement on cement sales by Firm A will be lessened if Firm A has large internal sales. This means that differences in vertical integration generate differences in incentives to coordinate. The greater the level of external sales, the more a firm will have to lose during a retaliation phase because it cannot rely as much on guaranteed internal sales. In addition, a firm in such a position is also likely to be more affected by deviations by others. At the other extreme, a firm which consumes all its cement in its own downstream operations can only be punished through downstream prices. As explained in Appendix 8.5, this is likely to be a less immediate and effective punishment mechanism.

8.245 In our view, the asymmetries between the GB producers in the extent of vertical integration—and the resulting differences in their incentives to coordinate—affects the roles of the GB producers in the market, as described in paragraphs 8.246 to 8.256, but are not sufficient to prevent coordination taking place.

### *Role of Lafarge (pre-2013)*

8.246 Lafarge is the largest cement producer in GB (in terms of capacity and market share) and also the cement producer which is most reliant on sales to external customers due to the fact that its RMX share (at GB level) is low relative to its cement share. Overall, therefore, Lafarge is likely to be the cement producer which bears the highest risks in case of deviation by others: its profits will be most affected because of its high reliance on and high share of external cement sales.

8.247 The fact that Lafarge benefits most from coordination (because it is the largest cement producer), as well as being likely to bear the highest risks in case of deviation (because of its high reliance on external sales), gives Lafarge an incentive to take a leadership role in the coordination (such as leadership in price announcements, as well as in close monitoring and punishment of any deviations). It also gives Lafarge an incentive to take a greater proportion of any costs of coordination, such as the costs of accommodating the growth of the competitive fringe (in terms of market share loss). There was evidence that Lafarge had a leadership role in the cement market, thereby facilitating coordination:

(a) We found that Lafarge was most commonly the first to announce price increases to its customers (see paragraph 7.185).

(b) Lafarge's market share had reduced the most in absolute terms as a consequence of (i) Tarmac increasing its cement capacity and (ii) importer growth (see paragraph 7.8), which suggested that Lafarge had taken most of the costs of accommodating the growth of the competitive fringe and which would be consistent with Lafarge aiming to maintain stability in the market.<sup>202</sup>

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<sup>202</sup> Hanson told us that the GB producers had reacted differently to the demand slump, in terms of the extent to which they reduced their cement capacity, and that this demonstrated clear asymmetry and a lack of stability in any theory of coordination. Hanson argued that it was not clear, for example, whether these reactions were accommodating and how these would allow prices to be coordinated upwards. We noted that Lafarge, Hanson and Cemex had all reduced cement capacity following the demand slump, and that Lafarge had reduced capacity the most. However, as set out in the footnote to paragraph 8.164, we did not consider that the focal point for coordination was capacity nor that the accepted shares of sales for each coordinating firm were mechanically derived from each firm's capacity.

(c) Our analysis of cross-sales (see paragraphs 7.198 to 7.203 and Appendix 7.13) showed that, despite large reductions in cross-sales as a consequence of internalizations, Lafarge remained a large seller of cement to each of the other Majors (with the exception of Tarmac) in 2011, selling over [REDACTED] per year to Cemex, Hanson and Aggregate Industries. This provides a means for Lafarge to signal to Hanson and Cemex, through change in terms of cross-sales, when a deviation has been detected. The fact that Lafarge continues to sell cement to all other Majors also means that any Lafarge price announcement letters would be sent to all other Majors, in their capacity as customers of Lafarge.

### *Roles of Hanson and Cemex*

8.248 Hanson and Cemex are both medium-sized cement producers, with similar cement capacities and market shares. Hanson and Cemex operate with a degree of excess cement capacity. The proportions of their cement sales which are internal are very similar.

8.249 Hanson, Cemex and Lafarge have similar profit drivers, in that their respective cement divisions make the largest contribution to their consolidated profits (see paragraph 7.134).

8.250 Cemex and Hanson are likely to have strong incentives to adhere to the coordination: they benefit strongly from coordination due to their size, they can be punished in the event of a deviation because of their relatively large external sales of cement, and can punish others due to the fact that they hold excess cement capacity. The evidence suggested that Cemex and Hanson's behaviours in the market (replying to loss of customers or cross-sales by retaliating against the producer responsible, strategic objectives of stability of shares of sales and price announcement behaviour,

among others) were consistent with coordination between Lafarge, Hanson and Cemex.

8.251 As noted in paragraphs 7.141 and 8.10, the difference between [X] and [X] profitability on one hand and [X] profitability on the other hand can be explained by differences in efficiencies between firms. Thus we considered that some of the higher profits that Hanson and Cemex might otherwise have obtained from participating in the coordination might have allowed them to continue to operate in the market with lower efficiency than other firms during a period of highly adverse trading conditions.

### *Role of Tarmac (pre-2013)*

8.252 Tarmac is in a very different position from that of Lafarge, Hanson and Cemex. It has the lowest market share and production capacity, and is the producer with the highest degree of vertical integration. Unlike Cemex, Hanson and Lafarge, whose production of cement largely exceeds their needs for cement for their internal businesses, Tarmac was until recently 'short in cement' (ie its total production was insufficient to fulfil its demand for cement), and in 2011 was broadly self-sufficient. Tarmac also appears to have the most modern and most efficient cement plant in GB (see Appendix 6.5), which it operates at full capacity utilization unlike Lafarge, Hanson and Cemex's plants. Tarmac is also different because, unlike Lafarge, Hanson and Cemex, its cement division contributes only [X] per cent to its consolidated profits (see Appendix 6.5), which implies that it has different profit drivers.

8.253 Tarmac told us that, as a result of its very high degree of vertical integration and its strategy of self-supplying cement, it only sold cement to external customers on an opportunistic basis, when the margins achieved on external sales exceeded any loss of margin due to having to purchase cement from other GB cement producers to cover the requirements of its downstream businesses.

8.254 As a result of Tarmac's high degree of vertical integration, and of Tarmac's incentives to sell externally only when the margin is high enough to compensate for having to buy cement from other GB producers for its downstream businesses, we see that:

- (a) If Tarmac increases share compared with the other GB cement producers, it will be difficult to punish due to its low external sales volumes.
- (b) Tarmac is also unlikely to have an incentive to undermine the coordination. It will only sell cement when the price is sufficiently high, and it has limited ability significantly to increase sales of cement to external customers because of its high internal requirements and its lack of spare capacity.

8.255 On balance, it therefore seems appropriate—as set out in our mechanism for coordination (see paragraph 8.218)—to consider Tarmac as a fringe cement player which lacks both the incentive and the ability to significantly undermine coordination. The evidence from the price announcement letters, as well as the evidence from the analysis of price correlation, confirms that the pricing behaviour of Tarmac is aligned with that of the other cement producers, ie it does not seek to undermine coordination.

8.256 It is also important to recognize that the coordination in the GB cement market is reflected in Tarmac's returns (see paragraphs 7.140 and 7.141), despite it not being in the coordinating group of firms.

### *Role of Aggregate Industries*

8.257 As set out in paragraph 3.5, Aggregate Industries is the only Major without GB cement production capability. It imports cement from its sister company (Holcim Germany) into GB, and also buys large amounts of cement in GB.

8.258 We considered the role of Aggregate Industries as an importer of cement, and its ability to constrain prices in GB, in paragraphs 7.101 to 7.104. We found that, although Aggregate Industries was the largest GB importer in terms of volumes of cement imports, Aggregate Industries imported cement predominantly for internal use ([redacted] per cent of imports were used internally). In addition, Aggregate Industries also buys large quantities of cement from the GB producers, predominantly [redacted] since 2009.

8.259 Aggregate Industries is therefore in a unique position: it has significant demand for cement [redacted], it has a large import business but [redacted] also [redacted] purchases of cement from the other Majors.

8.260 We also reviewed evidence on the prices charged for cement by the other Majors to Aggregate Industries (see paragraph 7.202) and how these compared with the prices to non-Majors, controlling for distance and size of customer. Up until the end of [redacted], Aggregate Industries was buying large quantities of cement from [redacted]. From [redacted] onwards, most purchases by Aggregate Industries were from [redacted]. We therefore focus here on the prices charged by [redacted] and [redacted] to Aggregate Industries. We found that:

(a) the average price charged to [redacted] until Q1 2009; since Q2 2009 the average price charged by [redacted]; and

(b) the average price charged by [redacted] between Q1 2007 and Q4 2011.

8.261 This evidence strongly suggests that Aggregate Industries, by virtue of its large purchases and/or of its threat to increase imports into GB, is able to obtain [keen] prices for cement [redacted]. However, Aggregate Industries' external sales of imported cement are very low, which suggests that (as set out in paragraph 7.104) Aggregate

Industries' large imports are unlikely to be a constraint on the prices of cement charged by GB producers on customers other than Aggregate Industries.

- 8.262 The fact that Aggregate Industries [redacted] purchases of cement from GB producers is likely to act as a disincentive to Aggregate Industries selling cement to independent customers. This is because the GB cement producers could react to this by increasing the price of cement charged to Aggregate Industries. Our review of Aggregate Industries' internal documents confirmed that Aggregate Industries used its ability to import cement as leverage in negotiations with GB cement producers, [redacted].
- 8.263 We also analysed the role of Aggregate Industries at the time of the large internalization of purchases by Hanson in early 2009 (see paragraphs 7.204 to 7.212). Our analysis led us to the view that Aggregate Industries switched its cement purchases to [redacted] at that time because it was in its own interests to do so, and not because of any concerns regarding maintaining stable shares of sales in the cement market.
- 8.264 Overall, the evidence suggests that Aggregate Industries is able to obtain [keen] prices for cement [redacted] because of its large size and because GB cement producers may fear that Aggregate Industries could increase imports to sell to independent customers. However, Aggregate Industries does not constrain GB cement prices to other buyers, because [redacted].<sup>203</sup> Although Aggregate Industries may be able to resist large increases in prices for cement as a purchaser, its presence would not appear to prevent Lafarge, Cemex and Hanson coordinating on sales of cement to other GB cement customers.

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<sup>203</sup> [redacted]

*Impact of market developments: Lafarge Tarmac and HCM*

8.265 As explained in paragraph 7.222, we expect Lafarge Tarmac to follow broadly similar competitive strategies in cement to those pursued by Lafarge prior to 2013, at least in terms of all the key factors that contribute to the mechanism of coordination we have described.

8.266 HCM will be quite similar to Tarmac prior to January 2013, in terms of having a single cement plant, and in terms of its market position in cement and RMX, but will have some additional cement capacity and a significantly smaller aggregates business. We considered three possible scenarios for HCM's future behaviour as part of our competitive assessment of the GB cement markets:

- (a) HCM might behave similarly to Tarmac prior to January 2013 but with additional cement capacity. Under this scenario it might seek to sell out its cement capacity, through both internal and external sales, but would act essentially as a taker of cement prices that were largely determined by the actions of the other three GB cement providers. Whilst HCM would act independently of the other three GB cement producers under this scenario, this might not be sufficient to undermine coordination by the other GB cement producers, given the fact that HCM operates a single, fixed capacity plant. Under this scenario, our concerns about coordination would be unlikely to be reduced to any great degree.
- (b) HCM might pursue a more proactive competitive strategy than Tarmac did prior to 2013. This might involve, for example, vigorous price competition, widespread attempts to encourage customer switching or investment in new capacity.
- (c) The cement market might become subject to some form of coordination involving HCM and other GB cement producers. This might involve HCM developing a shared understanding with other GB cement producers about their likely behaviour and might result in HCM producing at less than its available capacity. Under

this scenario, our concerns about coordination would be unlikely to be reduced and could increase.

8.267 At this stage, it is not possible to say which of these scenarios is likely to prevail. The strategies of the other Majors over the next few years are also a factor likely to have an impact on how HCM seeks to compete in the markets under investigation. We explain how we took into account the formation of HCM in coming to our conclusions on competition in the GB cement markets in paragraph 8.281.

#### *Effects of coordination on competition*

8.268 The mechanism for coordination in paragraph 8.218 describes Cemex, Hanson and Lafarge limiting competition between them, as a result of the recognition of their mutual interdependence, by taking steps to reduce any incentives to increase volumes and shares of sales. Such coordination is likely to dampen any price competition between them and therefore result in higher average prices for cement than if they actively sought to increase their shares of sales.

8.269 We also considered the effect of any such coordination on the difference in cement prices faced by Major and non-Major cement customers. There is no evidence to suggest that non-Major cement customers pay more for cement than the Majors do. Rather, the evidence suggests that Majors tend to charge higher prices to each other than they do to non-Major customers on average (see paragraph 7.202). There is also no evidence to suggest that GB cement producers favour their own downstream operations by charging lower prices on internal sales (see Appendix 6.5).

8.270 Therefore, we do not think that the outcome of coordination in the GB cement markets is to increase the prices paid by non-Major customers relative to prices paid by the downstream operations of the Majors. Rather, Lafarge, Cemex and Hanson

are seeking to maintain rather than increase their pre-existing shares of sales (see paragraph 8.218) which reduces—but does not necessarily eliminate (see paragraph 8.176)—competition between them to supply individual customers. In addition, Tarmac’s pricing behaviour is aligned with that of Lafarge, Cemex and Hanson (see paragraph 8.255) and cement importers have incentives to price their cement just below the price of GB-produced cement (see paragraph 7.105). We therefore think that the likely effect of coordination is to raise the average price of cement for all GB cement users—regardless of which supplier this cement is purchased from and regardless of whether this cement is ultimately sold through non-Major RMX producers (where it is likely to result in higher average prices for RMX), non-Major concrete product producers, independent merchants or through the downstream businesses of the Majors.<sup>204</sup> As set out in paragraph 8.215, only a modest proportion of total cement sales may be (to an extent) protected from the effects of coordination by buyer power.

### *Quantification of detriment*

8.271 Our preliminary findings are that there is a material customer detriment arising from coordination in cement.<sup>205</sup> One approach to assessing the detriment associated with high cement prices is on the basis of industry profitability.<sup>206</sup> There are other possible approaches which may also yield reasonable estimates of the detriment and we

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<sup>204</sup> We did not receive many submissions from bulk or bagged cement customers complaining about cement prices or other aspects of the supply of cement—although there were a small number. We considered that there were likely to be several reasons for this relative lack of customer concern. First, we found some evidence of large customers obtaining particularly favourable terms for cement supplies (see paragraph 8.214). Second, we found that customers were (in the case of bulk cement) downstream firms using cement as an input to their own products (RMX, mortar, concrete products etc) or (in the case of bagged cement) builders’ merchants or retailers, selling cement on to end-users. Such firms were likely in our view to be more concerned about the relative price they paid for cement (ie that the price they paid was not substantially different from the price paid by their competitors in their downstream markets) than the absolute price (within limits) they paid. If the effect of coordination is to raise cement prices to all GB users of cement, this would generate fewer customer concerns about apparently unfair relative prices—and customers would not be able to compare the prices they were paying with the prices that would prevail in a competitive market.

<sup>205</sup> We also consider that there is a material customer detriment in the GB cement markets arising from the features we identify in paragraph 8.292 that relate to arrangements for the production of GBS and GGBS and that give rise to a separate AEC in the GB cement markets. The profitability-based estimate of the detriment we present in the following paragraphs covers the detriment arising from coordination in cement and—in part—from the arrangements for the production of GBS and GGBS, in so far as these result in higher cement profitability than would otherwise be the case (our estimate does not cover other forms of detriment from the AEC arising from these arrangements, for example detriment arising from higher GGBS prices than might otherwise be the case). We expect to carry our further work on estimating the detriments arising from the AECs we have identified in the context of our work on remedies.

<sup>206</sup> See the Guidelines, [paragraph 103](#).

expect to carry out further work on estimating this detriment as part of our assessment of the proportionality of possible remedies.

8.272 Using industry profitability information to estimate the customer detriment relies on the observation that the return on capital<sup>207</sup> less firms' cost of capital<sup>208</sup> is a measure of returns in excess of what would be expected given the risk taken. To arrive at an estimate of detriment, we multiplied this measure of excess returns by the industry's total net assets.<sup>209</sup>

8.273 Our initial estimate of the detriment using a profitability approach is approximately £180 million over the period from 2007 to 2011.<sup>210</sup> This estimate uses the profitability based on the continuing costs of supply of GB cement producers during the period from 2007 to 2011. However, this figure may underestimate the scale and significance of customer detriment for various reasons, including the short-term impact on profitability arising from the cement producers' adjustment to the large reduction in cement demand that occurred during this period and the possibility that detriment may manifest itself through the ongoing inefficiency of some suppliers rather than through high profitability.<sup>211</sup> In addition, if a profitability approach is adopted for estimating customer detriment, then our profitability analysis indicates that customer detriment has been increasing year on year over the period from 2008 to 2011.

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<sup>207</sup> We used ROCE based on continuing costs of supply as found in Appendix 7.7, Table 11.

<sup>208</sup> The estimate relies on our midpoint estimate of the GB cement producers' cost of capital (WACC)—10 per cent—as set out in Appendix 4.2.

<sup>209</sup> We used total net assets as found in Appendix 7.7, Table 11.

<sup>210</sup> Hanson argued that, if coordination (were it to exist) led to sustainable prices to customers in line with long-run average incremental costs, then such coordination would not be detrimental to customers, and might confer positive benefits. However, we considered that excessive prices amounting to detriment to customers of the order of £180 million over a five-year period outweighed any putative benefits to customers from sustainable prices.

<sup>211</sup> For example, when estimating ROCE we did not adjust asset values for the higher operating costs undoubtedly associated with some older and less well-located plant locations and therefore the cement producers' profitability based on continuing costs of supply will be understated.

### *Cement competitive assessment: conclusions*

- 8.274 Evidence on market outcomes indicated that competition in the GB cement markets was not working effectively and was consistent with a degree of coordination on shares of sales. This evidence included (a) increases in average prices in real terms between 2007 and 2011 and maintenance of the GB producers' variable profit margins—with three out of the four GB producers able to increase their margins—against a backdrop of declining demand and increasing costs; (b) profitability based on the continuing costs of supply across the GB producers (and for Lafarge, Hanson and Cemex taken together) exceeding the cost of capital from 2007 to 2011 despite the demand slump during this period and the fact that this profitability measure was not adjusted for the higher operating costs undoubtedly associated with some older and less well-located plant. In addition, the profitability of three out of four cement producers (on all the bases we analysed) rose to levels beyond those at that start of the period despite the continued adverse trading conditions; and (c) there being only small changes in shares of sales despite the significant demand slump in 2009. We also found that customers who did not switch between cement suppliers did not benefit from the relatively lower prices of those customers that did switch—in other words, there was price discrimination. In a well-functioning market, faced with a demand slump, significant excess capacity and high fixed costs, we would expect that market participants would compete vigorously on price to maintain volumes, resulting in greater volatility in shares, significant erosion of margins with returns at or below the cost of capital (and not increasing beyond previous levels while adverse trading conditions continued).
- 8.275 Internal documents provided direct evidence of coordination by Lafarge, Hanson and Cemex and/or a strategic approach by them to activity in the market by Lafarge, Hanson and Cemex that was aimed at coordinating to achieve market stability. As noted above, the strength of the evidence in the internal documents varied over time.

The more recent internal documents also provided evidence of examples of competition between GB producers.<sup>212</sup> In relation to this last observation, as noted in paragraph 8.36, the earlier internal documents we reviewed were collected using a different methodology from the more recent internal documents we reviewed, and we did not expect these document sets to be fully comparable. In particular, the 2008 documents are a selected set of documents, [REDACTED].

8.276 We found that the GB cement markets were characterized by high concentration (see paragraph 7.15), a significant degree of transparency (see paragraph 8.162), frequent interactions between the main cement producers and a lack of complexity in the competitive environment and the products (see paragraphs 7.29 and 7.30). These factors, taken together, suggest that the GB cement producers have strong awareness of each other's actions and are able to anticipate each other's future actions, leading to strategic interdependence in the competitive behaviour of the cement suppliers and coordination between Cemex, Hanson and Lafarge. Additional factors that in our view increased the structural susceptibility of these markets to coordination included high barriers to entry (see paragraph 7.56), limits to the competitive constraint imposed by imported cement (see paragraph 7.105) and vertical integration into downstream operations (see paragraph 8.219).

8.277 We found evidence that three GB cement producers (Cemex, Hanson and Lafarge) recognized the current (and past) structural susceptibility of the GB cement markets to coordination and took steps to exploit this susceptibility, using shares of sales as a focal point and with Lafarge taking a leadership role. This evidence included a strategic focus on maintaining market stability between the members of the coordinating group rather than independently pursuing unconstrained growth, frequently manifested in a focus on maintaining existing (or returning to pre-existing) relative shares

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<sup>212</sup> A degree of competition within bounds is compatible with coordination for the reasons set out in paragraph 8.176.

of sales (see paragraphs 8.51 to 8.58, 8.89 to 8.114 and 8.171 to 8.178); price announcement behaviour (contributing to price leadership and price following, and to softening of customer resistance to price increases—see paragraph 8.164); tit-for-tat share balancing and retaliation (see paragraphs 8.69 to 8.73, 8.76, 8.115 to 8.139 and 8.193 to 8.201); use of cross-sales as a mechanism for transparency, signalling and, on occasion, share balancing and retaliation (see paragraphs 8.46 and 8.47, 8.85 and 8.203 and 8.204); and attempts to target importers beyond normal competition on price and service (see paragraphs 7.105, 8.74 and 8.146 to 8.149).

- 8.278 We concluded that, although the extent to which they were satisfied might vary over time, the conditions for coordination to be sustained were met in the GB cement markets (with shares of sales as the focal point) in relation to the ability to reach and monitor coordination, the existence of a mechanism for internal sustainability and the external sustainability of coordination.
- 8.279 We described a mechanism for coordination (with shares of sales as the focal point) which was supported by the available evidence. There was some evidence that there were periods when coordination was more successful, and periods when it was less successful (for example, in 2009 following Hanson's large internalization of cement volumes).
- 8.280 We found that it was likely to be in the interests of Lafarge, Cemex and Hanson to adhere to the mechanism for coordination we described, whereas Tarmac was likely to be a fringe player. Furthermore, Lafarge's position as the largest cement producer, as well as the least vertically-integrated producer, is likely to give it strong incentives to take a leadership role in the coordination—and in particular to take on more of the costs of coordination (including the costs of accommodating the growth in share of sales of fringe cement suppliers, ie Tarmac and cement importers). The different

incentives of the GB producers (arising, for example, from differences in their size and in the extent to which they made external sales of cement) explain the different roles they adopt in the market, which in turn explains why shares of sales have not been perfectly stable despite the coordination which has been occurring in the market. Their different incentives also explain why asymmetries in their shares of sales, capacity and degree of vertical integration do not prevent—and may even facilitate—coordination.

8.281 In relation to recent market developments, the evidence and analysis available to us indicated that the structural susceptibility of these markets to coordination, and the behaviour of market participants seeking to exploit this susceptibility, had existed over a number of years, and had been resilient to other large changes in market conditions (in particular, the significant downturn in demand and the vertical integration of Hanson into cement production over the years 2007 to 2009). Therefore we considered that the replacement of Tarmac (a single plant producer which we had found to be outside the coordinating group of firms without coordination breaking down as a result) by HCM (which is also a single-plant producer—albeit with some additional capacity compared with Tarmac) as the smallest GB cement producer was likely to be insufficiently market disrupting on its own materially to reduce our concerns about coordination in the GB cement markets. Similarly, we did not consider that a possible future recovery in demand was likely to undermine coordination in these markets, given that coordination has persisted during the current period of significantly reduced demand.

8.282 We conclude that there is a combination of structural and conduct features that give rise to an AEC in the GB bulk and bagged cement markets.

8.283 The structural features are:

- (a) high market concentration;
- (b) transparency of sales and production shares, wins and losses and customer-supplier relationships;
- (c) high barriers to entry (including limits to the constraint imposed by imported cement);
- (d) homogeneity of product;
- (e) customer characteristics and behaviour (in particular, regularity of purchases, purchases at fixed locations, concentration of customer base and single sourcing for a particular job site); and
- (f) vertical integration from cement into downstream operations.

8.284 The conduct features, the individual significance of which varies over time, are:

- (a) a strategic focus on maintaining market stability between the members of the coordinating group, frequently manifested in a focus on maintaining existing (or returning to pre-existing) relative shares of sales;
- (b) price announcement behaviour (which facilitates price leadership and price following, and softens customer resistance to price increases);
- (c) tit-for-tat behaviour used to balance shares and for retaliation;
- (d) use of cross-sales as a mechanism for transparency, signalling and, on occasion, share balancing and retaliation; and
- (e) attempts to target importers beyond normal competition on price and service.

8.285 These structural and conduct features combine together to give rise to an overarching feature in the GB cement markets, namely coordination among Cemex, Hanson and Lafarge.

8.286 The likely effect of these features is higher prices of cement in GB than would otherwise be the case for all GB cement users,<sup>213</sup> whether this cement is ultimately sold through independent RMX and concrete producers, independent merchants or through the downstream businesses of the Majors.

8.287 We consider there to be a material customer detriment arising from high cement prices. Using one of several possible approaches to quantifying this detriment (which was based on our profitability analysis and which we considered to be reasonable) indicated that this detriment was of the order of £180 million over the period from 2007 to 2011. However, there are several reasons that we consider this figure likely to be an underestimate of the actual detriment arising. These reasons include the short-term impact on profitability arising from the cement producers' adjustment to the recent large reduction in cement demand and the possibility that detriment may manifest itself through the ongoing inefficiency of some suppliers rather than through high profitability. We expect to refine our estimate of the detriment in the context of our work on remedies.

## **GGBS**

8.288 As set out in paragraphs 7.127 to 7.130, we found evidence of possible competition problems in relation to the supply of GGBS in GB. Although we did not define the GB cement markets to include GGBS, the GB cement markets include blended cement made with GGBS (see paragraph 5.53). Total GGBS production is equivalent to about 18 per cent of total cement production in GB (see paragraph 7.113). GGBS represents the clear majority of total GGBS and PFA sales in the UK: GGBS sales are about three times higher than PFA sales, and the constraint imposed on GGBS

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<sup>213</sup> Although certain buyers (such as Aggregate Industries and some of the larger bulk and bagged cement buyers) may be able to exert a degree of buyer power and offer some resistance to price increases, these customers represent only a modest proportion of total cement sales and, given the high degree of price discrimination in the GB cement markets, their buyer power is unlikely to benefit customers of cement more generally.

by PFA did not appear sufficient to offset any competition problems in the supply of GGBS (see paragraphs 7.122 and 7.127 to 7.130).

8.289 Hanson told us that it was not able to exercise market power in relation to GGBS in GB. It said that this was because (a) Hanson competed with importers of GGBS products; (b) the substitutability of GGBS with cement constrained the pricing of GGBS; (c) PFA was a readily available substitute for GGBS which served as a strong constraint on all GGBS; and (d) the majority of GGBS purchasers were big companies using large volumes of the material, and purchasers had significant bargaining power.

8.290 However, in our view, the existence of an upper limit on pricing (for example, from GGBS imports or cement made principally from clinker and/or PFA) is not sufficient to show that there is no market power. Further, regardless of the size of buyers, countervailing buyer power would only exist where purchasers had access to a sufficiently attractive alternative to purchasing GGBS. In addition, buyer power exerted by some GGBS purchasers would seem unlikely to protect all buyers from higher prices, given the bilateral and confidential nature of purchase negotiations.

8.291 Hanson supplies the vast majority of GGBS in the UK (see paragraph 7.114) as a result of its exclusive long-term contract with Tarmac (now Lafarge Tarmac) for the purchasing of GBS for grinding into GGBS, and Lafarge Tarmac's exclusive agreements with the GB steel producers for the production of GBS. There are no other suppliers of GB-produced GGBS, and there is evidence that imported GGBS faces disadvantages compared with GB-produced GGBS (see paragraphs 7.114, 7.116 and 7.130). Our comparison of Hanson's GGBS volumes, prices and margins with its cement volumes, prices and margins (see paragraphs 7.128 and 7.129) was

consistent with Hanson possessing a degree of market power in relation to GGBS, resulting in higher prices for GGBS in GB than might otherwise be the case.

8.292 We therefore found that Lafarge Tarmac's exclusive agreements with the GB steel producers for the production of GBS, and Hanson's exclusive long-term contract with Lafarge Tarmac for the production of GGBS, in combination with Lafarge Tarmac's and Hanson's participation in the GB cement markets, were features that gave rise to an AEC in the GB cement markets,<sup>214</sup> resulting in higher prices for cement than might otherwise be the case. Our initial estimate of the detriment associated with higher cement prices than might otherwise be the case is set out in paragraph 8.273.

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<sup>214</sup> Because both Hanson and Lafarge Tarmac are active in the GB cement, aggregates and RMX markets, their conduct in relation to GGBS may, under section 131(2) of the Act, be taken to be a feature of the cement market (see paragraph 4.9).

## **9. Competitive assessment: RMX**

### ***Introduction***

- 9.1 As set out in paragraph 5.53, we have defined a single relevant product market for RMX, including all specifications of RMX, RMX supplied from fixed plants and site plants and concrete supplied from volumetric trucks. We found that RMX markets were highly localized in nature, with narrow catchment areas within about 8 to 10 miles of RMX plants, albeit with some scope for variation in catchment area according to local factors and the means of distribution.
- 9.2 In this section, we set out our assessment of whether there are features that give rise to one or more AECs in the GB RMX markets through unilateral market power or coordination (see paragraph 4.20). As explained in Section 4, much evidence is relevant to consideration of both unilateral market power and coordination and we therefore present our assessment of the scope for unilateral market power and coordination together in a single section of this report.
- 9.3 Paragraphs 4.25 and 4.28 contain key extracts from the Guidelines on how the CC will conduct its assessment of unilateral market power and coordination. In light of the Guidelines, to conduct our assessment of whether unilateral market power or coordination may be giving rise to one or more AECs in GB RMX markets, in this section we analyse:
- (a) aspects of market structure;
  - (b) market outcomes; and
  - (c) the impact of recent market developments (see paragraphs 4.35 to 4.37).<sup>1</sup>

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<sup>1</sup> To the extent that companies' conduct in GB RMX markets was relevant to our assessment, this was covered as part of our assessment of market structure, market outcomes and market developments.

9.4 We conclude this section by setting out our competitive assessment of the GB RMX markets in light of this analysis.

### ***Market structure***

9.5 In this subsection, we look at several aspects of the structure of RMX markets in GB that are relevant to our assessment of the possible existence of unilateral market power or coordination in these markets:

- (a) shares of supply at GB and county level;
- (b) the characteristics of RMX customers and their purchasing behaviour; and
- (c) the extent of barriers to entry and expansion in RMX markets.

9.6 GB RMX markets are characterized by considerable vertical integration from aggregates and cement into RMX production (see paragraphs 2.78 to 2.80). We assess the availability of cement and aggregates as inputs for RMX production as part of our assessment of barriers to entry and expansion in RMX markets (see paragraphs 9.44 to 9.52). Our assessment of the impact of vertical integration on competition more broadly is set out in Sections 8 and 10.

### ***Shares of supply at GB level***

9.7 We examined shares of supply of RMX in GB as a whole to understand the position of the key market players overall.

9.8 Table 9.1 shows the pre-2013 Majors' shares of supply of RMX in GB (ie before the creation of Lafarge Tarmac and the entry of HCM into the relevant markets), alongside the total share of supply held by the non-Majors. The table shows that the pre-2013 Majors collectively supplied 66 per cent of RMX in GB, based on 2011 volumes and including volumetric trucks.

TABLE 9.1 **Pre-2013 Majors' and non-Majors' shares of supply of RMX in GB**

	<i>Aggregate Industries</i>	<i>Cemex</i>	<i>Hanson</i>	<i>Lafarge</i>	<i>Tarmac</i>	<i>Total pre-2013 Majors</i>	<i>Total non-Majors</i>
	[10–12]	[16–18]	[1–18]	[6–8]	[14–16]	6	33

Source: CC, based on BDS data for 2011 including volumetric trucks.

9.9 Table 9.2 shows the 2013 Majors' shares of supply of RMX in GB (ie following the creation of Lafarge Tarmac, the entry of HCM into the relevant markets), alongside the total share of supply held by the non-Majors. The table shows that the 2013 Majors collectively supply 66 per cent of RMX in GB (including volumetric trucks), just as the pre-2013 Majors did.

TABLE 9.2 **2013 Majors' and non-Majors' shares of supply of RMX in GB**

	<i>Aggregate Industries</i>	<i>Cemex</i>	<i>Hanson</i>	<i>Lafarge Tarmac</i>	<i>HCM</i>	<i>Total Majors</i>	<i>Total non-Majors</i>
Total GB	[10–12]	[16–18]	[16–18]	[8–10]	[12–14]	66	33

Source: CC, based on BDS data for 2011 including volumetric trucks; assuming total volumes divested to HCM of 2,800m<sup>3</sup>; as reported by Anglo-American and Lafarge to the CC during the Anglo–Lafarge remedies process.

9.10 RMX markets are local (see paragraph 5.52), and it is local concentration that is key to any assessment of the scope for unilateral market power or coordination in specific local markets. Given that in our initial assessment we have not found any significant evidence on barriers to entry and expansion in RMX (see paragraph 9.52), and in light of limited time and resources, we did not have reason to analyse local RMX markets in detail. However, to understand in general terms the possible extent of concentration in RMX production in different parts of GB, we examined shares of production at county level:<sup>2</sup>

(a) In terms of the Majors' individual shares of supply, in 2010, the highest RMX share held by any Major in a county was 56 per cent. Not all Majors had RMX

<sup>2</sup> Source: BDS data. There are a total of 64 counties in GB. Local markets for RMX would be likely to be smaller than these counties.

operations in all counties, and two Majors had no RMX operations in over a third of counties. Several non-Major RMX producers had shares of production in individual counties in the range of 22 to 42 per cent. However, we noted that the larger non-Major producers tended not to be present (or to have only a small share of production) in those counties where total RMX production was high.

(b) In terms of the Majors' collective share of supply, of the 64 counties in GB, the Majors collectively had a share of 100 per cent of production in six counties; and the Majors collectively had a share of more than 50 per cent of production in 51 counties.

9.11 There were around 194 non-Major RMX suppliers in GB in 2011, operating around 352 RMX plants. In addition to this, there were around 183 volumetric truck operators in 2011 (some of which overlap with the RMX suppliers), operating around 206 volumetric trucks.<sup>3</sup> Most independent RMX producers are small, with many operating only one site (1.81 sites on average); in comparison, the five Majors operated 781 RMX plants collectively. Non-Majors' sites tend to be smaller than Majors' sites on average; as shown in Figure 9.1 below, the Majors' sites tend to have a higher concentration of the larger RMX sites than the non-Major RMX producers.<sup>4</sup>

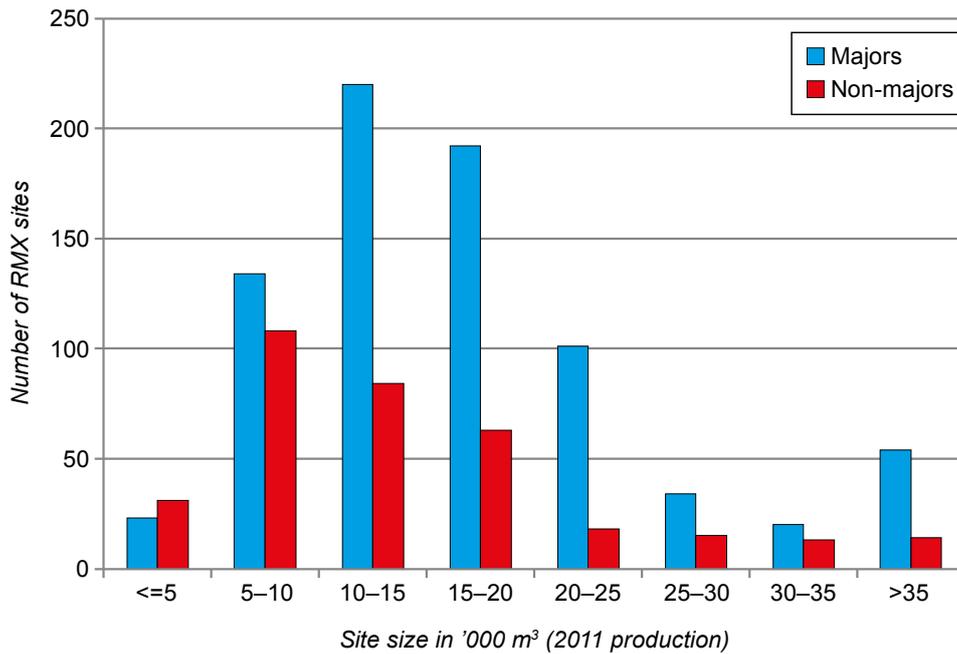
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<sup>3</sup> Source: BDS data.

<sup>4</sup> The mean volume production by site, according to BDS data in 2011, was 19,000 m<sup>3</sup> for sites operated by the Majors versus 15,000 m<sup>3</sup> for sites operated by non-Majors.

FIGURE 9.1

**Distribution of Majors' and non-Majors' RMX sites by size**



Source: BDS data, CC analysis.

*RMX customers and their purchasing behaviour*

*Characteristics of RMX customers*

9.12 The large majority of RMX customers purchase RMX on a project base; there are very few fixed outlet customers. However, the size and type of project for which RMX is purchased, and the type of customers, varies widely. Table 9.3 sets out, for each Major's RMX business, the top 10 customer types by amount purchased in 2011. This shows that there are many different types of customer for RMX and uses of RMX.

TABLE 9.3 Top 10 customer types by total amount purchased, 2011

Rank	RMX customer types			
	Cemex	Hanson	Lafarge	Tarmac
1	Large civils frame & flooring	[X]	Building contractors	Building/civil engineering
2	Regional specialists	[X]	Civil engineering contractors	Building contractor
3	Ground workers	[X]	Ground worker	Ground worker
4	Large contractors & house builders	[X]	Cash sales	Concrete frame contractor
5	Local builders	[X]	Specialist contractors	Piling
6	Regional builders	[X]	Builders' merchants	Flooring specialist
7	Small civils	[X]	Specialist flooring contractors	Utility contractor
8	Small builders & DIY	[X]	Precast producers	Private/cash sales
9	Builders merchants	[X]	Piling contractors	Builders' merchants
10	Farmers	[X]	Cable and utility contractors	Ground stabilization

Source: CC analysis of parties' transaction data.

Note: [X] In this table the ranking refers to customers for whom we know the type, excluding customers with unknown type, even though those customers account for a large part of the Majors' sales.

9.13 Table 9.4 sets out the distribution of Majors' RMX customers by amount purchased in 2011. We see that customers purchasing 1,500m<sup>3</sup> or more of RMX per year account for the majority of revenue of all of the Majors in 2011.

TABLE 9.4 Distribution of RMX customers by amount purchased, 2011

Size band	Share of all purchases, per cent				
	Aggregate Industries	Cemex	Hanson	Lafarge	Tarmac
<3m <sup>3</sup>	[X]	[X]	[X]	[X]	[X]
3–15m <sup>3</sup>	[X]	[X]	[X]	[X]	[X]
15–45m <sup>3</sup>	[X]	[X]	[X]	[X]	[X]
45–200m <sup>3</sup>	[X]	[X]	[X]	[X]	[X]
200–1,500m <sup>3</sup>	[X]	[X]	[X]	[X]	[X]
>1,500m <sup>3</sup>	[X]	[X]	[X]	[X]	[X]

Source: CC analysis of parties' transaction data.

9.14 Table 9.5 measures the concentration of RMX customer base, by showing the percentage of each Major's total RMX sales accounted for its top 50 customers. We see that, in contrast to cement and aggregates, the customer base for RMX is relatively fragmented, with the top 50 customers accounting for around 20 per cent or less of three of the Majors' RMX sales, but with higher concentration in the customer base for the other two Majors.

TABLE 9.5 **Percentage of sales accounted by top 50 customers, 2011**

	<i>Share of all purchases, per cent</i>				
	<i>Aggregate Industries</i>	<i>Cemex</i>	<i>Hanson</i>	<i>Lafarge</i>	<i>Tarmac</i>
Top 50 customers	[x]	[x]	[x]	[x]	[x]

Source: CC analysis of parties' transaction data.

*Purchasing behaviour*

- 9.15 Lafarge told us that it did not publish prices for RMX. All prices were given in a quotation which was personal to each particular customer and would be specific to a particular delivery or collect location (except for a very limited number of customers who might have prices specific to a slightly wider geographic area—such as a city or district).
- 9.16 Lafarge said that although formal tenders were comparatively rare, its RMX customers (typically building contractors, civil engineering companies and other specialists) invariably operated a less formal tender process to secure the best supply. Typically, when a contractor was bidding for work on a particular project, it would request quotations for material prices from Lafarge and other suppliers in order to establish costings for its bid. Once the project or sub-project had been awarded to the winning contractor or subcontractor, it would then enter negotiation with the various suppliers giving each the opportunity to beat the lowest price received. This negotiating process might be repeated more than once.
- 9.17 Lafarge said that where it had entered into partnering arrangements with major customers to supply major public schemes, the material supply to partner companies was still subject to formal or informal retendering which partner companies would undertake to 'market test' the prices they received from Lafarge.

- 9.18 Tarmac told us that 'formal tenders' tended to be received in relation to work in either the public sector or for larger contracts. In the public sector this type of approach was common among local authorities where they were looking to secure supplies of materials for use in highways maintenance over a set period (typically 12 months or more). Formal tenders might result in a contract award based on sealed bids (usual in the public sector) or might be a means to move through to a more detailed negotiation on a 'preferred supplier' basis with the customer/client.
- 9.19 Tarmac said that written/verbal enquiries were the basis for the majority of quotations issued by it. Customers approached Tarmac with the basic details of their requirements, and Tarmac responded to such an enquiry with a quotation. Larger volumes would be pursued through Account Managers with the Internal Sales team taking responsibility for smaller volumes. However, due to prioritization of limited sales team resources, a large number of small-volume quotations were not followed up by Tarmac unless the customer proactively approached the business.
- 9.20 Published price lists were not common practice within the sector. Tarmac told us that it published price lists only for cash sale customers (ie customers that did not have an account with Tarmac) calling directly at one of Tarmac's plants to collect material. Each plant would hold a list of site-specific cash sale prices.
- 9.21 [REDACTED] told us that it tailored the way in which it marketed its products and negotiated for new work according to the type of customer and type of work it was hoping to secure. It said that it differentiated between major projects, non-major projects and casual sales of RMX.
- 9.22 In relation to major projects, [REDACTED] told us that it invested resources in tracking possible projects and often would seek early engagement with the client. It would sometimes

seek to identify and align itself with the contractor that it judged had the best chance of winning the end-customer contract. Almost all major projects were tendered either to construction contractors or directly to material producers. If the project was tendered to construction contractors, these contractors in turn would often tender the supply of RMX. More commonly, however, the construction contractor and the materials suppliers would team up before submitting a bid. As a starting point for negotiation on most major contracts, [REDACTED] used an internal price list set on a regional basis. The RMX price lists reflected a plant mix cost plus a margin with an increment added for the standard cost of haulage. The price lists were not published. Together with these lists, [REDACTED] circulated instructions on the level of discount that certain grades of sales staff were authorized to agree off the list prices.

9.23 In relation to non-major projects (including national, regional and local construction companies), [REDACTED] said that these projects constituted the bulk of its work. [REDACTED] would be approached by construction contractors at a local level to quote for the potential supply of RMX to a specific project. It would also try to identify other construction companies that were likely to be bidding and to offer to quote for supply of the relevant material. It typically negotiated contracts for the supply of aggregates and RMX to non-major projects on a bilateral basis. Formal tendering was less common, although some larger customers would engage in a formal tender process, despite the overall quantities procured being relatively small. The [REDACTED] sales team would typically provide a construction contractor with a quote based on the price lists. The prices contained in the various local price lists were the starting point for negotiations between [REDACTED] and the customer.

9.24 Casual customers could often be drop-in sales, often called cash sales. They could also be cash delivery of a low volume of RMX (minimix). [REDACTED] used a different price list for drop-in cash sales than it did for delivered sales. It also had a separate price

list for minimix deliveries. The purchaser would pay a price commensurate with the relatively specialized nature of the product and small load size they required.

9.25 Hanson told us that formal tenders might be run by public sector purchasers, customers who were required to undergo tendering procedures and other customers for big projects. Hanson told us that whilst formal tenders represented a relatively low proportion of RMX customers (albeit a higher proportion of volumes as larger jobs were generally subject to formal tenders), most customers conducted informal tendering or testing the market in order to secure the best price and processes.

9.26 Hanson said that RMX customer purchasing patterns typically had the characteristics of classic spot purchasing, including: purchasing on a job-by-job basis; showing little loyalty to existing suppliers (where relevant); seeking quotes from multiple suppliers; and choosing a supplier largely on price.

9.27 Hanson told us that some of the factors relevant for the determination of the price which it was prepared to offer new and spot customers or the final price offered to existing customers following a price negotiation included: the location of the customer; quality and technical considerations; and the likely volumes to be purchased by the customer and the extent to which higher volumes led to cost savings for Hanson.

9.28 In relation to prices, Hanson said that prices were generally individually negotiated. [REDACTED] Hanson only used externally available price lists for ad hoc sales to customer

who purchased on a cash basis, and these accounted for a small proportion of its total sales.<sup>5</sup>

- 9.29 Cemex told us that customers would generally obtain quotations from a number of RMX suppliers before placing an order. Cemex RMX's sales were made through a range of different customer interactions, from a large number of straightforward verbal or written enquiries, through to requests to complete short tender sheets or a full formal tender process.
- 9.30 In relation to formal tenders, Cemex said that the UK RMX industry tended to have two main stages of quotation or tendering before an order was confirmed. The first stage was where a number of building/construction contractors tendered for a particular job with an end-client. Quotations provided by Cemex to the contractors at this stage were normally indicative to help the contractor to provide a quotation to the end-client. Cemex was not always asked to provide quotes to all potential contractors on a bid but in principle would provide a quote to any of the tendering contractors that requested one. At the second stage, the end-client would have determined a smaller number of building/construction contractors to continue to tender based on their own selection criteria. If a contractor to which Cemex had provided a quotation in the first stage remained in the process, Cemex would typically be asked to resubmit a further quotation to that contractor. The contractor would typically seek a number of competitive quotes from different RMX suppliers again at this stage.
- 9.31 Cemex also told us that Cemex RMX did not use published price lists for RMX supplied in the UK.

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<sup>5</sup> Hanson told us that the proportion of customers who paid the 'list price' was low—for example, only around [§] per cent of Hanson's supplies of RMX in the North region were to cash customers.

*Customers undertaking large projects*

- 9.32 Given the evidence of the specialist requirements of some RMX customers undertaking large projects and requiring very large volumes of RMX,<sup>6</sup> we considered whether such customers might have a more limited choice of RMX supplier than might be indicated simply by considering shares of RMX production locally.
- 9.33 Hanson told us<sup>7</sup> that many suppliers (both Majors and non-Majors) had the necessary capability to supply such customers, and RMX producers from outside the local area could compete by setting up a site plant.
- 9.34 According to Aggregate Industries,<sup>8</sup> our concerns about whether large RMX customers had less choice than smaller ones were unfounded because:
- (a) These large customers were small in number and were sophisticated purchasers, well able to protect their own interests.
  - (b) Independents had a wide range of large-capacity and small-capacity RMX plants to meet such customers' requirements.
  - (c) For a small number of very large (and often very high-profile) projects such as [REDACTED], security of supply was an issue for customers. Aggregate Industries acknowledged that suppliers with an integrated supply chain and back-up sources of supply would be at an advantage for such projects. However, it also pointed out that it found itself increasingly competing with contractors planning to set up on-site plants for such projects.
  - (d) Large suppliers might be at an equivalent disadvantage when bidding for smaller projects as independent suppliers might be perceived to be more local.

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<sup>6</sup> [BAM Nuttal hearing summary](#), paragraphs 5–6.

<sup>7</sup> [Hanson response to updated issues statement](#).

<sup>8</sup> [Aggregate Industries response to updated issues statement](#).

- 9.35 Tarmac told us<sup>9</sup> that it had seen no evidence that customers requiring large volumes of RMX had a more limited choice of RMX supplier than other customers. In its view:
- (a) Low barriers to expansion meant that small RMX producers could expand to meet the demands of larger customers.
  - (b) Large customers could set up their own site plants.
  - (c) It had seen an increasing use of volumetric trucks and site plants for larger jobs.
- 9.36 Lafarge argued<sup>10</sup> that site plants also competed with fixed RMX plants for large jobs, and that the Majors did not control the rental of RMX site plants. According to Lafarge, RMX suppliers did not have to be in the vicinity of a large project to bid for that project, given the possibility of using a site plant. It noted that customers could also operate site plants themselves. Therefore, in its view, customers requiring large volumes of RMX did not face less choice of supplier than other customers.
- 9.37 Cemex said<sup>11</sup> that, due to the volumes involved, there was invariably intense competition for larger projects both from Majors and increasingly from independents. According to Cemex, such orders tended to be subject to additional downward pressures on prices given the increased buyer power.
- 9.38 Our conclusions on competition for customers requiring very large amounts of RMX are set out in paragraph 9.68.

### *Entry and expansion*

- 9.39 In order to understand the extent to which entry and expansion were able to constrain RMX producers, we examined:
- the extent of past entry and exit into the GB RMX markets; and

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<sup>9</sup> Tarmac response to updated issues statement.

<sup>10</sup> Lafarge response to updated issues statement.

<sup>11</sup> Cemex response to updated issues statement.

- barriers to entry into and expansion in the GB RMX markets.

Further details of our analysis of entry and expansion in RMX markets are presented in Appendix 9.1.

### *Extent of past entry and exit*

9.40 Aggregate Industries and Tarmac provided us with estimates of the total number of RMX sites that were opened and closed in the UK between 2007 and 2010. These estimates are set out in Table 9.6. The table shows that, according to both Aggregate Industries and Tarmac, the Majors accounted for a substantial proportion of the total sites opened and closed.

TABLE 9.6 **RMX sites opened and closed in the UK, 2007 to 2010**

	<i>Information provider</i>	
	<i>Aggregate Industries</i>	<i>Tarmac</i>
Total sites opened	[X]	133
Sites opened by the Majors	[X]	89
Total sites closed	[X]	204
Sites closed by the Majors	[X]	166

*Source:* Aggregate Industries, Tarmac.

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*Note:* In both cases the information was based on reports prepared by BDS, and supplemented in the case of Aggregate Industries with its own market intelligence. Possible reasons for the inconsistencies between the information provided by Aggregate Industries and Tarmac are that the submissions do not distinguish between sites and plants, entries and expansions, closure and mothballing or entry and reopening.

9.41 Tarmac also told us that, according to BDS, 23 new RMX suppliers commenced production between 2005 and 2009 and that the share of supply accounted for by local and regional suppliers (not including volumetric trucks) increased from 17 per cent in 2000 to 27 per cent in 2010. Tarmac noted that the Majors made the largest number of exits from RMX.

9.42 These figures are consistent with the share of supply figures in Table 10.1, which indicate that, in terms of share of supply of RMX in GB, the independent and non-integrated suppliers have grown at the expense of the Majors.

9.43 In addition to fixed plants, RMX can be supplied by volumetric operators. It is estimated that the share of sales of RMX by volumetric trucks has increased from 8.2 to 9.2 per cent between 2009 and 2011 (see Table 9.7).<sup>12</sup> Lafarge estimated that, between 2006 and 2010, the share of sales of RMX by volumetric trucks increased from [0–5] per cent in 2006 to [5–10] per cent in 2010 and to [8–10] per cent in 2011.

TABLE 9.7 Growth in volumetric trucks over time

	<i>Market share of volumetric trucks, per cent</i>					
	2006	2007	2008	2009	2010	2011
BDS estimates				8.2	8.9	9.2
Lafarge estimates	[0–5]	[0–5]	[0–5]	[0–5]	[5–10]	[8–10]

Source: BDS and Lafarge estimates.

Note: BDS estimates are taken from BDS 2009 and 2010 annual reports and BDS data for 2011. Lafarge's estimates (submitted in the market questionnaire) are using BDS figures from the same reports for 2009, 2010 and 2011 and the assumption that prior to the recession, new volumetric trucks were being commissioned at a rate of around [8–10] per year (as set out in BDS reports).

### *Barriers to entry and expansion*

9.44 We considered the evidence relating to the following possible barriers:

- capital cost;
- availability of raw material;
- planning permission; and
- barriers to expansion.

9.45 The Majors told us that the capital investment required for RMX production was low. Estimates ranged from £0.1 million for second-hand plant to £1.5–£2 million for a large-scale plant. The Majors also told us that entry into the supply of RMX using volumetric trucks required very little initial capital investment as the trucks could be purchased second-hand or leased. Evidence from volumetric truck operators confirmed that even with associated costs (eg cement silos), the capital costs need not be high. The size of these costs would vary depending on site acquisition costs, scale of entry etc (see Appendix 9.1).

<sup>12</sup> BDS estimates; BDS only started estimating volumetric truck shares in 2009.

- 9.46 One concern raised with us was whether independent RMX producers could gain access to supplies of cement and aggregates given that the suppliers might also be competitors in RMX. The Majors told us that independent RMX producers formed an essential customer base for their businesses. They said that aggregates were readily available from a variety of suppliers, given the excess production capacity in aggregates in the UK. We note the findings from our aggregates PCA and EEA analysis that nearly 100 per cent of aggregates customers have more than five aggregates plants with 20 miles for urban job sites and 28 miles for rural job sites, suggesting that there is significant supplier choice available to independent RMX producers (see paragraph 6.18). Hanson also told us that the Majors' networks of aggregates plants and RMX plants were not optimized for self-supply, with the result that individual aggregates plants might be dependent on sales to non-vertically-integrated RMX producers.
- 9.47 Similarly, the Majors told us that independent RMX producers formed an essential customer base for cement, and that imported cement was readily available to RMX producers.
- 9.48 We received mixed evidence from medium-sized RMX producers, some saying that access to cement had not been a problem whereas others expressed concern, particularly with respect to the price of cement that went into their RMX (see Appendix 9.1). However, we found evidence that was inconsistent with widespread foreclosure of independent RMX producers in recent years (see Section 10).
- 9.49 We did not receive evidence to indicate that planning permission raised a barrier to entry for RMX plants. We were told that any planning consents required could be obtained within three months of application.

9.50 The Majors told us that there were few or no barriers to expansion. They said that, as prevailing levels of capacity use were low, expansion within existing capacity would not be problematic. We were told that, because variable costs constituted the great majority of RMX production costs, no significant increase in fixed costs would be incurred to increase production within existing capacity.

9.51 The Majors also told us that there were no significant barriers to increasing the capacity of an existing site. This would be likely to be achieved by replacing the plant with a higher-capacity model. We were told that a revision to the site's planning consent would probably be required but this would not be costly or difficult.

#### *Conclusions on entry and expansion*

9.52 We concluded that barriers to entry and expansion in the GB RMX markets were generally low, though this may vary depending on the particular circumstances of local markets. We found that low levels of capital investment were required, there was a lack of economies of scale and there were low regulatory barriers. The use of volumetric trucks enables entry at a small scale with a limited investment. There is little evidence that the terms on which aggregates and cement are available for purchase by RMX producers raises a barrier to entry into the supply of RMX.

#### **Market outcomes**

9.53 In light of what the Guidelines say on market outcomes that the CC may take into account in its AEC assessment (see paragraph 4.13) and our unilateral market power and coordination theories of harm for RMX (see paragraph 4.20), in this subsection we look at the following outcomes in the GB RMX markets:

(a) profitability; and

(b) margins.

## Profitability

- 9.54 We have conducted an assessment of the profitability of the Majors' RMX operations across GB in accordance with our profitability framework as set out in Appendix 4.1. Appendix 9.2 also sets out our detailed results and our interpretation of RMX profitability in GB.
- 9.55 We assess the Majors' profitability by comparing their ROCE<sup>13</sup> with their cost of capital. We calculated their ROCE by using accounting information prepared on a (modified<sup>14</sup>) HCA basis, the basis on which the Majors routinely prepare their financial information. We have not analysed profitability on a CCA basis as we have been able to infer that such an analysis would not alter our conclusions.<sup>15</sup>
- 9.56 ROCEs based on the Majors' own valuation of their assets (modified) HCA basis suggest that the generally large ROCEs in 2007 have deteriorated a great deal since that time. As set out in Table 9.8, the Majors taken together have been loss-making since 2008 and each has been loss-making since 2009 albeit with some variation across the individual Majors. This finding suggests that it would be in the economic interest of at least some of the Majors to rationalize further the number and/or location of their RMX sites, so that their remaining portfolio of sites becomes profitable on a sustainable basis.

TABLE 9.8 Calculated ROCE for each Major on an HCA basis over the period 2007 to 2011

	<i>Profit/capital employed, per cent</i>				
	2007	2008	2009	2010	2011
Cemex	[X]	[X]	[X]	[X]	[X]
Hanson	[X]	[X]	[X]	[X]	[X]
Tarmac	[X]	[X]	[X]	[X]	[X]
Aggregate Industries	[X]	[X]	[X]	[X]	[X]
Lafarge	[X]	[X]	[X]	[X]	[X]
Overall	0.7	(5.1)	(25.2)	(33.6)	(27.5)

Source: CC analysis based on Appendix 9.2, Tables 3(a) to (e).

<sup>13</sup> ROCE is a measure of profitability. For this purpose it is measured as the operational profit for a period divided by the value of the operational net assets relevant to the same period expressed as a percentage.

<sup>14</sup> Some Majors have revalued some of their fixed assets.

<sup>15</sup> See Appendix 9.2, paragraph 26.

## *Margins*

- 9.57 Appendixes 6.5 and 6.6 describe our analysis of the cost structures and the profit margins of the RMX operations of the Majors and of the medium-tier independents.
- 9.58 Our analysis of the cost structures of the Majors' and medium-tier independents' RMX divisions showed that variable costs accounted for the highest proportion of their total costs, where variable costs predominantly comprised the costs of raw material inputs, ie aggregates and cement. Therefore the prices at which the Majors' RMX businesses purchase aggregates from their own upstream operations (known as transfer prices) will have a significant effect on the apparent profitability of their RMX businesses, and the margins being made. As set out in paragraphs 7.84 and 7.85, Hanson and Tarmac told us that they transferred aggregates to their downstream RMX businesses at higher prices than they sold aggregates externally, and the other Majors told us that they transferred aggregates internally at market prices.
- 9.59 Our analysis shows that, for each Major, RMX margins (at divisional level) have eroded over the period 2007 to 2011—with price increases being outpaced by growth in variable costs. However, these margins are lower for [REDACTED] and [REDACTED] due to their higher internal aggregates transfer pricing policy. Adjusting for this, their RMX margins improve considerably.<sup>16</sup> Our analysis also shows that the 'mid-tier' RMX producers have also faced margin erosion, driven by a combination of price erosion and upward cost pressures.

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<sup>16</sup> We calculated the 'financial impact' for each Major of its aggregates transfer prices, by multiplying the difference between average internal and external prices for primary aggregates (further split into seven product subcategories, eg crushed rock graded and crushed rock dust, etc) for that Major by the internal volumes of that product subcategory. In calculating divisional margins, this financial impact should correctly be allocated to the aggregates division if internal prices are the same as market prices, whereas this financial impact should be allocated to the RMX division if internal prices are higher than market prices. If it is assumed that internal prices are set higher than external prices on a like-for-like basis, then this would result in an RMX margin enhancement of [REDACTED] per cent for [REDACTED], and [REDACTED] per cent for [REDACTED].

9.60 We also compared the costs of aggregates and cement per cubic metre of RMX between the Majors and a selection of the medium-tier independents. We found that the cost of aggregates for the medium-tier independents was broadly within the range of the costs incurred by the Majors. However, we found that whilst the cost of cement per cubic metre of RMX was broadly similar for all the Majors, there was far greater variation for the medium-tier independents we looked at. Our analysis of cost structures for the Majors' and medium-tier independents' RMX divisions are set out in Appendices 6.5 and 6.6.

### **Market developments**

9.61 The impact of the formation of Lafarge Tarmac and the entry of HCM on shares of supply of RMX at GB level may be seen by comparing Tables 9.1 and 9.2.

9.62 Prior to the formation of Lafarge Tarmac and the divestitures required by the CC, Lafarge had [X] RMX plants (of which [X] were mothballed) producing [X] million m<sup>3</sup> of RMX (2010 figures). Tarmac had [X] plants (of which [X] were mothballed) producing [X] million m<sup>3</sup> of RMX (2010 figures). Lafarge Tarmac now has [X] RMX plants (of which [X] were mothballed as at 1 May 2012) producing [X] million m<sup>3</sup> of RMX (2010 figures) and HCM has [X] plants producing just over [X] million m<sup>3</sup> of RMX (2010 figures).<sup>17</sup>

9.63 There has therefore been little overall change in terms of consolidation in shares of supply of RMX at GB level as a result of the formation of Lafarge Tarmac and the entry of HCM. The number of major RMX producers is unchanged, as is the combined share of supply at GB level of the four UK cement producers and of the five Majors. Assuming similar overall levels of capacity utilization, Lafarge Tarmac has a

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<sup>17</sup> A further five RMX plants were not sold to HCM. As at the end of April 2013, Lafarge Tarmac had sold one of these to an independent RMX producer, and had yet to sell the remaining four (which will be divested separately by Lafarge Tarmac during 2013).

GB share of RMX supply similar to that held by Lafarge prior to divestiture, and HCM has a similar share to that held by Tarmac prior to divestiture (although Lafarge Tarmac and HCM both now own a combination of former Lafarge and Tarmac RMX plants).

- 9.64 At a local level, it was not possible to repeat our county-level analysis of RMX concentration with the data available to us, as this analysis relied on county-level production figures which were not broken down by individual plant. However, it is possible that the formation of Lafarge Tarmac and the entry of HCM may have resulted in high concentration in slightly more local RMX markets than beforehand (eg where a local overlap was considered unproblematic during the CC's Anglo–Lafarge JV inquiry, or where the remedy required by the CC as a result of its Anglo–Lafarge JV inquiry did not require divestment of the entire overlap). However, the CC in its Anglo–Lafarge JV report did not expect any such increases in local concentration to give rise to competitive harm, once the divestitures had been implemented.

### ***Our assessment***

- 9.65 As set out in paragraphs 4.20 and 4.21, we assessed whether features of GB RMX markets gave rise to one or more AECs as a result of unilateral market power or as a result of coordination.
- 9.66 Our analysis indicates that:
- (a) Whilst the Majors collectively supply 66 per cent of RMX at GB level, the extent of concentration in local markets for RMX appears to be limited.
  - (b) The customer base for RMX is relatively fragmented; RMX customers tend to purchase on a project basis.
  - (c) Whilst not all local RMX producers may be able to supply customers requiring very large volumes of RMX for a particular project, such customers are also likely

to have some purchaser power, and have other options such as tendering for (or self-supply through) an RMX site plant. RMX suppliers may not have to be in the vicinity of such a project to bid for it.

- (d) Barriers to entry and expansion are low.
- (e) The generally large ROCEs in 2007 by the Majors in their RMX operations have deteriorated a great deal since then and that the Majors' RMX operations taken together had been loss-making since 2008.
- (f) For each Major, RMX margins (at divisional level) have eroded over the period 2007 to 2011, and the 'mid-tier' RMX producers have also faced margin erosion.
- (g) There has been little overall consolidation in shares of supply of RMX at GB level as a result of the formation of Lafarge Tarmac and the entry of HCM, and we had limited concerns about the impact of these market developments on concentration in local markets.

### *Unilateral market power*

#### *Parties' views*

9.67 The Majors told us that there was no unilateral market power in any GB RMX market.

In particular:

- (a) Aggregate Industries told us<sup>18</sup> that RMX customers had a choice of suppliers and returns were under substantial pressure. It said that RMX demand was shrinking in a very competitive market, and that independent producers could compete for [X] per cent or more of Aggregate Industries' sales.
- (b) Hanson said that independent RMX producers competed with it in every RMX market. It told us<sup>19</sup> that RMX markets were highly competitive for the following reasons:

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<sup>18</sup> [Aggregate Industries response to updated issues statement.](#)

<sup>19</sup> [Hanson response to updated issues statement.](#)

- There were multiple suppliers (Majors, independents and volumetric truck operators).
- Volumetric trucks could supply outside their local area, as the RMX was produced on site.
- Barriers to entry and expansion were low.
- Independent producers had increased and continued to increase their share of supply and capacity, during a time of depressed demand and reduced capacity of the Majors.

(c) Lafarge said<sup>20</sup> that there was dynamic competition in the supply of RMX in all local markets, in particular due to:

- competition from a large number of other national and local RMX producers;
- significant excess capacity in the hands of competitors, which could be utilized should any producer seek to increase prices;
- relatively low costs of entry into the production of RMX; and
- competition from volumetric trucks.

### *Assessment*

9.68 Given the indications that the extent of concentration in local markets for RMX may be limited, the lack of barriers to entry, the ease with which existing suppliers of RMX could expand their output and the relatively poor performance of the RMX businesses we analysed, we found that widespread unilateral market power in the GB RMX markets was unlikely. We found little evidence that competition for customers requiring very large volumes of RMX for particular projects would be less effective than competition for other customers.

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<sup>20</sup> [Lafarge response to the issues statement.](#)

## *Coordination*

### *Parties' views*

9.69 The Majors told us that there was no coordination in any GB RMX market. Aggregate Industries said that the market conditions necessary to sustain tacit coordination were not met. In particular, it told us that there would be no ability to reach and monitor coordination because of the lack of homogeneity of the products supplied, the fact that customers had a wide choice in many local markets, and that there was no symmetry in market shares or cost structures among suppliers. It also told us that there was no internal ability to sustain coordination because it had significant excess capacity which gave it a strong incentive to seek additional business and because barriers to switching were low. Finally, it said that coordination would not be externally sustainable because of the low barriers to entry and countervailing buyer power.

### *Assessment*

9.70 Taking into account what the Guidelines say regarding the assessment of whether coordination is giving rise to an AEC (see paragraphs 4.28, 8.159, 8.160, 8.181 and 8.2085), the supply of RMX in GB appeared to have fewer structural features than in the case of aggregates or cement that might give rise to concerns about coordination. There was some evidence that the Majors collectively held a high market share in some local RMX markets (see paragraph 9.10). However, the lack of barriers to entry and expansion into RMX supply (see paragraph 9.52), the complexity of maintaining coordination in multiple local RMX markets, the declines in the profitability of the Majors' RMX operations since 2007 coupled with the erosion of their margins (at divisional level) meant that we found that widespread coordination in the GB RMX markets was unlikely.

*RMX competitive assessment: conclusions*

- 9.71 Overall, we did not find evidence indicating widespread problems across multiple local RMX markets (whether as a result of unilateral market power or coordination). Given the lack of concerns raised by our analysis and given constraints on the time and resources available for our investigation overall, we did not carry out further analysis of individual local markets for RMX. We have not identified any features giving rise to an AEC in any market in GB for the supply of RMX through unilateral market power or coordination.
- 9.72 We considered that recent market developments (see paragraphs 9.63 and 9.64) did not have a material impact on our competitive assessment of the GB RMX markets.

## **10. Vertical integration and its effects on competition**

- 10.1 Aggregates and cement are key inputs into the supply of RMX. Some of the largest companies involved in these sectors are vertically integrated, and some have become more vertically integrated in recent years as a result of acquisitions (see Appendix 3.2). Notably, the four GB cement producers also have significant aggregates and RMX operations: together, these four cement producers accounted for [about 55] per cent of the share of supply of primary aggregates in GB, and about 66 per cent<sup>1</sup> of the share of supply of RMX in GB. Other companies have both aggregates and RMX operations and may be involved in the importation of cement. Aggregate Industries in particular has significant aggregates and RMX operations in GB and is owned by a major European cement producer, Holcim Ltd.
- 10.2 In addition to the increased vertical integration in the sector as a result of various acquisitions, there has been a trend in the past five years for the Majors to increase the amount of cement that is sourced internally by their RMX operations (as opposed to purchases from other GB cement producers—see Appendix 2.3). For aggregates, there has not been a similar trend, but the proportion of aggregates which are self-supplied has remained high throughout the period for all of the Majors' integrated RMX and asphalt businesses.
- 10.3 In this section, we set out our assessment of whether vertical integration in aggregates, cement and RMX may give rise to one or more AECs through exclusionary behaviour towards rivals (see paragraphs 4.30 to 4.32).<sup>2</sup> We also present evidence on the possible efficiencies which may be associated with vertical integration.<sup>3</sup>

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<sup>1</sup> Source: BDS report 2011; combined share of Majors for sales of RMX in GB including volumetric trucks.

<sup>2</sup> We did not receive any submissions on whether vertical integration might soften competition in the RMX markets, and therefore do not consider this theory of harm in this section.

<sup>3</sup> Our analysis of the way in which vertical integration may affect competition in the cement market through its impact on ability and incentives to coordinate is set out in Section 8 and Appendix 8.5.

10.4 We first review evidence on the rationales for vertical integration and the possible efficiencies associated with it. We then present our assessment of whether vertical integration may give rise to one or more AECs through exclusionary behaviour.

### ***Rationales for and efficiencies from vertical integration***

10.5 The Majors told us that vertical integration enabled them to:

- (a) exploit efficiencies in their supply chains;
- (b) remove double marginalization;<sup>4</sup>
- (c) more efficiently forecast demand for aggregates and cement;
- (d) obtain access to RMX end-customers allowing a better understanding of their needs and allowing integral solutions for complex and value-added projects; and
- (e) ensure the supply and quality of inputs for their RMX businesses.

10.6 On the other hand, some parties have indicated that increased vertical integration could lead to some logistical difficulties and could make it more difficult to serve some customers that might prefer a more 'local' approach. Appendix 10.1 provides supporting evidence on the possible efficiencies, advantages and disadvantages of vertical integration from parties' submissions and internal documents.

10.7 In general, many internal documents of the Majors (for example, strategy reports) view vertical integration as a strength (or the lack of sufficient vertical integration as a weakness), and having a balanced portfolio of aggregates, cement and RMX is seen as beneficial. The main advantages of vertical integration that come out of the internal strategy documents of the Majors appear to be the ability of the upstream businesses to sell internally (route to market) and of the downstream businesses to source internally (security of supply).

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<sup>4</sup> The elimination of double marginalization appears unlikely to be a significant efficiency in this market. Indeed, double marginalization occurs if both the upstream and the downstream businesses hold market power. RMX appears to be generally competitive (see Section 9), which makes it doubtful that double marginalization would occur if companies were not vertically integrated.

- 10.8 There are very few internal documents which refer to specific efficiencies linked to vertical integration over and above the two advantages in paragraph 10.7. Further, no vertically-integrated company was able to quantify the total value of these benefits. Lafarge told us that its ability to produce value-added products (adding £[redacted] in profits) relied on its vertical structure. Hanson stated that vertical integration was not essential to compete in the industry or to provide an independent customer base. However, Hanson told us that vertical integration was key to its business, in allowing Hanson the efficiencies and independence of self-supply. We also reviewed evidence from smaller aggregates and RMX producers and from customers (see Appendix 10.1). Evidence from mid-tier independents highlights the importance of having a balanced portfolio. Breedon Aggregates, for example, explained how it usually tried to expand its aggregates business into markets where it already produced concrete or similarly increased its RMX presence in areas where it could supply aggregates. Brett Group told us that vertical integration gave cement producers the ability to balance their position.
- 10.9 Customers maintained some of the advantages of dealing with vertically-integrated suppliers in certain instances, although vertical integration did not seem to be always the primary or sole factor affecting their choice of supplier. Balfour Beatty explained that there might be advantages in dealing with vertically-integrated companies when there was a major project and it required large volumes. BAM Nuttal said that security of supply was an advantage of vertically-integrated companies and could be part of its decision-making process.
- 10.10 In summary, although the evidence from internal documents we reviewed suggested that the Majors perceived vertical integration to be a strength, we did not find evidence that there were large efficiencies associated with vertical integration between cement, aggregates and RMX.

## ***Vertical integration and exclusionary behaviour***

- 10.11 Foreclosure describes a behaviour by a vertically-integrated company to restrict its rivals' access to customers or to an essential input. If the strategy is successful, rivals may be excluded from the market (total foreclosure) or be unable to compete effectively (partial foreclosure).
- 10.12 None of the parties alleged, and nor did we find any evidence, that vertically-integrated producers are bundling cement, aggregates and/or RMX in a way that may distort competition in any of the reference markets. However, some parties made allegations that the vertical integration of the Majors from cement into RMX resulted in partial foreclosure of independent RMX competitors, for instance through restricting supply of cement (including by charging high prices of cement) to independent RMX competitors and/or because of cross-subsidies from the GB producers' cement businesses to their integrated RMX businesses, thereby creating a squeeze on the independent producers' margins.<sup>5</sup>
- 10.13 Most of the concerns of possible exclusionary behaviour related to the possibility of foreclosure with respect to the supply of cement, rather than the supply of aggregates. The high-level evidence on the supply of aggregates suggested that Majors may generally lack the ability to engage in such foreclosure because the five major vertically-integrated companies only account for around 30 per cent of aggregates used by independent RMX producers at a national level, suggesting that the majority of independents are able to source aggregates from companies other than the vertically-integrated companies. However, the Majors may account for a higher share of supply of aggregates in some local markets, which we have not investigated (see paragraph 6.125). We therefore do not consider foreclosure of downstream competitors through the supply of aggregates any further.

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<sup>5</sup> See [summary of hearing with BAA](#).

*Overview of the conditions for foreclosure through the supply of cement: ability and incentives*

10.14 As set out in the Guidelines, for vertical relationships to result in foreclosure of rivals, the firms involved must have significant market power in one or more markets along the supply chain. They will also need to have both the ability and an incentive to seek to foreclose rivals (this will not necessarily be the case, even if the firms enjoy significant market power).<sup>6</sup>

*Ability to foreclose*

10.15 Vertically integrated companies may have the ability to pursue a strategy to foreclose RMX rivals, either partially or fully, where the following conditions are satisfied:

- (a) the input supplied is important;
- (b) the vertically-integrated companies have a significant degree of market power in the supply of cement (either individually, or through the exercise of joint market power); and
- (c) RMX rivals do not have effective counter-strategies (such as switching to a different input).

10.16 We did not undertake a detailed analysis of the ability of vertical-integrated companies to foreclose rival RMX suppliers, for the reasons set out below in paragraph 10.33. However, we note that it is likely that vertically-integrated companies may have the ability, either unilaterally or in a coordinated manner, to foreclose independent RMX suppliers in certain local areas, for the following reasons:

- (a) Cement is a necessary input into the production of RMX. We estimate that cement and cementitious materials account for 39 to 45 per cent of variable costs of production of RMX (see Appendix 6.5, Table 6). A relatively small increase in

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<sup>6</sup> The Guidelines, [paragraph 274](#).

the price of cement may therefore adversely affect the ability of independent RMX suppliers to compete.

- (b) As set out in Section 8, we think that three of the four GB cement producers are likely to be able to exercise a degree of joint market power.
- (c) It does not appear likely that there are timely and effective counter-strategies that would allow independent RMX suppliers to avoid a price increase by switching from cement to a different input. Though some partial substitution to cementitious products (such as GGBS or PFA) may be possible, this will only be possible for RMX producers who have the facilities to store the additional inputs, and GGBS and PFA cannot substitute fully for cement.

*Incentives for foreclosure*

10.17 Incentives to engage in foreclosure strategies will depend on whether such a strategy is likely to be profitable. Foreclosure of downstream rivals will almost necessarily entail some costs, and therefore the incentives for foreclosure will depend on whether the potential gains from foreclosure outweigh the costs of a foreclosure strategy. The potential gains from foreclosure, and costs of foreclosure, can be thought as:

- (a) *Gains from foreclosure*: the proportion of RMX sales that switch from the foreclosed RMX producer(s) to the downstream RMX businesses of the vertically integrated producers, multiplied by the margin earned on those additional RMX sales.
- (b) *Costs of foreclosure*: the proportion of RMX sales that do not switch to the vertically-integrated supplier multiplied by the cement margins earned on those lost cement sales.

10.18 There may also be further gains from foreclosure above the immediate impact on RMX margins: it may be a profitable long-term strategy, in some circumstances, for a

vertically-integrated producer to seek to squeeze the margins of independent RMX producers in order to prevent the growth of independent RMX producers and limit the likelihood of their potential upstream entry in cement production or importation.

10.19 The higher the margin earned on RMX sales relative to the margin earned on cement sales, the more likely it will be profitable to foreclose downstream RMX rivals. If margins earned on RMX sales are low relative to cement margins, a strategy of foreclosure will be profitable only if the vertically-integrated producer is able to capture a relatively large proportion of the customers of the foreclosed independent RMX suppliers. This, in turn, is more likely to be the case if a Major is the closest competitor to the foreclosed independents.

10.20 Our estimates of margins on RMX and cement sales are presented in Appendix 6.5. We found that unit profit margins over variable costs were consistently higher for cement sales than they were for RMX sales: they ranged from [X] to [X] per cent for RMX and [X] to [X] per cent for cement for the period from 2007 to 2011. This was also consistent with submissions from various parties who told us that the RMX markets were generally competitive and did not generate high returns. The fact that RMX margins were generally low in comparison with cement margins suggested to us that a strategy of foreclosing independent RMX suppliers in order to capture a larger share of the RMX market (but with the cost of losing some cement sales) could only be profitable in local areas where a Major was the closest competitor to the foreclosed independent RMX suppliers.

### *Outcomes*

10.21 If foreclosure had been or was occurring, we could expect one or more of the following outcomes:

- (a) reduction in the margin on RMX earned by independent RMX producers (due to input prices increasing relative to RMX prices—thereby creating a margin squeeze);
- (b) exit by independent RMX producers; and
- (c) increase in the share of supply of RMX held by the vertically-integrated producers.

#### *Evidence of margin squeeze*

10.22 We found that there was evidence that the price of cement to independents had increased more, on average, than the average downstream price of RMX, suggesting that the margin available to RMX producers over cement costs was likely to have reduced between 2007 and 2011. We found that the average price of RMX charged by the Majors increased by between [X] and [X] per cent between 2007 and 2011 depending on the Major,<sup>7</sup> whereas the average price of cement charged by the GB cement producers to independents increased by between [X] and [X] per cent depending on the cement producer<sup>8</sup> between 2007 and 2011. This suggests that, all other things being equal, the margin of independent RMX producers over cement costs has reduced on average between 2007 and 2011, which could be indicative of a margin squeeze (though we note that impact on overall variable RMX margins would also depend on how other variable costs had evolved between 2007 and 2011).<sup>9</sup>

10.23 The GB cement producers told us that the observed fall in RMX prices compared with cement prices was not a consequence of foreclosure, but due to market conditions, and in particular the intensity of competition as a result of significant excess

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<sup>7</sup> Based on ex-works prices; calculated as gross revenue / cubic metre. See Appendix 6.5, Figure 31.

<sup>8</sup> Based on average weighted prices of CEM I charged by GB producers to independent customers; see Appendix 7.12, Figure 1.

<sup>9</sup> We also analysed variable profit margins of three mid-tier independent RMX suppliers in Appendix 6.6. However, there were no consistent results across the three producers.

capacity in the RMX sector due to the reduction in demand, as well as the emergence of new competitors in RMX (volumetric trucks).

10.24 We also noted that the Majors' internal pricing policies suggested, if anything, that their aim was to attempt to set high RMX prices rather than a policy of aggressive RMX pricing so as to attempt to squeeze independents margins. Indeed, to the extent that there was any cross-subsidization, the cross-subsidization occurred in the opposite direction:<sup>10</sup> relatively high aggregates internal prices were charged to internal RMX businesses—which would have the effect of transferring profits upstream rather than downstream and would not have the effect of incentivizing downstream management to compete particularly aggressively downstream.<sup>11</sup> We also noted that our analysis of the prices which GB cement producers charged each other for cement suggested that, in many cases, GB cement producers tended to charge each other higher prices, on average, than they did to independent customers (see paragraph 7.202). This did not appear consistent with strategies to foreclosure independent RMX producers. The internal pricing policies of the Majors and the evidence on pricing of cement cross-sales suggested that, rather than trying to foreclose independent RMX producers, the aim of the Majors was to soften competition in the downstream RMX markets.<sup>12</sup>

10.25 The internal documents we reviewed were generally not conclusive on the existence of foreclosure strategies (see Appendix 10.1). Although some Aggregate Industries documents alluded to low cement costs through vertical integration being a factor in driving down prices of RMX, other internal documents suggested that the reason for

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<sup>10</sup> See Appendix 6.5.

<sup>11</sup> Although we are looking at foreclosure in cement, it would not appear a consistent strategy for suppliers to both squeeze cement margins and try to inflate RMX prices through high aggregates prices.

<sup>12</sup> The potential for vertical integration to dampen competition is discussed in the Guidelines, [paragraph 271](#). Though we note that vertical integration could have the effect of dampening competition in RMX markets, we thought the main impact of vertical integration would be to dampen competition between cement suppliers through the role of vertical integration in coordination (see Section 8 and Appendix 8.5).

the reduction of RMX prices was increased competition as a result of the downturn and also due to increased presence of some independents.

10.26 There was an internal document which suggested that the vertically-integrated producers, rather than attempting to squeeze the margins of RMX competitors, were maintaining internal prices of aggregates artificially high in an attempt to dampen incentives on their downstream business to erode margins in RMX which would be inconsistent with foreclosure strategies. An example of this is an internal email from [REDACTED] to [REDACTED], dated 7 January 2008:

We must remember that Hanson [REDACTED] will follow their normal in-house policy of inflating their inter-company transfer prices and then letting their ready-mix concrete division find its own pricing level in the market- this is just what their main competitors [REDACTED] and [REDACTED] are currently doing!

[REDACTED]<sup>13</sup>

10.27 [REDACTED]

*Evidence on exit by independent RMX producers*

10.28 Estimates of the number of RMX sites that were opened and closed between 2007 and 2010 are presented in Section 9, Table 9.6. We note that, although there has been some exit by independent RMX producers in the period between 2007 and 2010, the estimates in Table 9.6 suggest that the Majors have closed many more sites than the independent RMX producers during the period, with the Majors accounting for 81 to 98 per cent of RMX sites closed between 2007 and 2010.

10.29 In addition, the estimates in Table 9.6 suggest that, while there has been net exit by the Majors between 2007 and 2010 (the number of sites closed by the Majors far

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<sup>13</sup> [REDACTED]

exceeds the number of sites opened by the Majors), there has been a small net entry by independent RMX producers. These facts do not appear consistent with any widespread foreclosure of independent RMX producers by the Majors, who appear to have reduced capacity in RMX since 2007.

*Evidence on RMX shares of supply*

10.30 We set out in Table 10.1 below estimates of the GB shares of RMX sales for years 2005 to 2011. This table does not include sales of RMX by volumetric trucks because BDS started to report on sales of RMX by volumetric trucks in 2009, and for the purpose of this analysis data on a longer time period was necessary. Therefore, the shares reported here are not the shares of sales on the relevant product market as defined in Section 5 and as reported in Section 9. Table 10.1 suggests that the share of independent RMX producers has grown from 21 per cent in 2005 to 27 per cent in 2011.<sup>14</sup> This appears inconsistent with any widespread foreclosure of independents by the Majors.

TABLE 10.1 **GB shares of RMX sales over time, 2005 to 2011**

	2005	2006	2007	2008	2009	2010	2011
							<i>per cent</i>
Hanson	[18–20]	[18–20]	[18–20]	[18–20]	[16–18]	[16–18]	[18–20]
Cemex	[20–22]	[20–22]	[18–20]	[18–20]	[18–20]	[16–18]	[18–20]
Tarmac	[18–20]	[18–20]	[20–22]	[20–22]	[18–20]	[16–18]	[14–16]
Aggregate Industries	[8–10]	[8–10]	[10–12]	[10–12]	[10–12]	[10–12]	[10–12]
Lafarge	[8–10]	[8–10]	[8–10]	[8–10]	[8–10]	[8–10]	[8–10]
Total Majors	<u>79.2</u>	<u>78.0</u>	<u>78.6</u>	<u>78.1</u>	<u>73.5</u>	<u>72.8</u>	<u>73.1</u>
Independents	20.8	22.0	21.4	21.9	26.5	27.2	26.9

Source: BDS reports.

<sup>14</sup> If volumetric trucks had been included, the increase in the share of independent RMX sector is likely to be larger. However, we do not have data on sales by volumetric trucks prior to 2009.

10.31 Brett Group told<sup>15</sup> us that high-level statistics on shares might be misleading and skewed by growth of independent RMX activity in and around the London region (and limited to lower-specification RMX products).

### *Conclusions*

10.32 The high-level evidence on shares, entry and exit, and pricing behaviour of the Majors did not point in the direction of any widespread foreclosure. On this basis and given the constraints on the time and resources available for our investigation overall, we did not have reason to prioritize further work to establish whether any foreclosure may have occurred in particular local markets for RMX, and did not do so.<sup>16</sup>

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<sup>15</sup> Brett Group hearing.

<sup>16</sup> This approach is supported by [paragraph 36](#) of the Guidelines—see paragraph 4.5.

## **11. Competitive effects of policy and regulation**

### ***Introduction***

11.1 In this section we consider whether certain aspects of regulation that cover the aggregates and cement markets in GB could affect the way competition works in those markets. We have focused on the areas of regulation and policy that were highlighted in the submissions we received from main and third parties. These are:

- (a) the planning regime for land-won primary aggregates, marine aggregates and secondary and recycled aggregates;
- (b) the aggregates levy;
- (c) the EU ETS; and
- (d) the CRC, CCAg and the CCL.

11.2 These areas of policy and regulation are described in Section 2 and Appendices 2.1 and 2.2.

### ***The planning regime***

#### ***Land-won primary aggregates***

11.3 We first consider whether aspects of the planning regime could affect competition. In particular, we discuss (a) whether the planning system creates barriers to entry, (b) issues relating to landbanks and (c) whether the role of AWP's increases market transparency in such a way that it could facilitate coordination between producers.

#### ***Obtaining planning permission***

11.4 We found in paragraph 6.55 that expanding an existing aggregates site, either by increasing its output or by extending the site, is likely to be easier, faster and cheaper than developing a new site, because the planning process is likely to be simpler and much of the required equipment will already be in place. We found that this implies that existing producers have an incumbency advantage over new entrants by

favouring extensions of existing quarries over developing new sites.<sup>1</sup> This applies to companies—regardless of size—with existing operational sites.

- 11.5 This is confirmed by planning permission approvals, which indicate that considerably more permissions are granted for extensions than for new developments. The Aggregates Minerals 2009 Survey showed that between 2006 and 2009, for sand and gravel, 126 permissions were granted for extensions as opposed to 36 permissions that were granted for new quarries. Similarly for crushed rock, for the same period, 49 permissions were granted for extensions of existing quarries and ten permissions were granted for new quarries.<sup>2</sup>

#### *Landbanks*

- 11.6 One of the key characteristics of the planning system for land-won primary aggregates is the use of landbanks.<sup>3</sup> This is described in Appendix 2.1. We considered possible ways in which planning policy regarding landbanks could have adverse implications for competition:
- (a) The MPA identified concerns that some LMPAs had interpreted the landbank recommendations (ie seven years' landbank for sand and gravel, and ten years' landbank for crushed rock) too rigidly with the effect that planning applications for aggregates sites might be refused if the landbank in an area extended beyond the periods set out in the planning guidance—this might make it more difficult for a new entrant to undertake aggregates extraction in competition with the incumbents in areas where the landbank targets were exceeded.

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<sup>1</sup> The MPA noted that local authorities might favour extensions to new sites in order, for example, to minimize the number of sites operating in a given area to minimize amenity and traffic impacts. Two of the Majors told us that LMPAs may have a preference for granting extensions to existing sites rather than for greenfield quarries, because they were not popular with local communities and for environmental reasons, although they said that local authorities would have to grant permissions for new developments in order to ensure sufficient supply to meet local demand (see Appendix 11.1, paragraphs 3 and 4).

<sup>2</sup> Collation of the results of the 2009 aggregates minerals survey for England and Wales.

<sup>3</sup> A landbank is defined as a stock of planning permissions (measured in years) for permitted reserves. It is calculated by dividing the volume of existing permitted reserves by the average annual provision in the area.

(b) Aggregates producers might have an incentive to obtain and hold sites with permitted reserves (either without developing them further, or by mothballing previously operational sites) so that the landbank in an area remains above the minimum target period and new entrants would find it difficult to obtain planning permission for new sites.

*Length of landbanks and ownership of permitted reserves*

11.7 The competition concerns expressed in the previous paragraphs are interrelated, in that overly-stringent interpretation of the landbank rules by LMPAs might reduce the competitive constraints on incumbent suppliers from new entrants, and incumbent suppliers might take steps (by holding sites with permitted reserves) to exacerbate the impact on competition of any such LMPA policy. In order to assess whether there might be geographic areas where there might be cause for concern, our approach has been to identify areas:

- (a) in which the landbank of sand and gravel or crushed rock met or exceeded the relevant minimum period (on the basis that in those areas, the relevant LMPA might be less willing to grant planning permission for new aggregates sites); and
- (b) of the areas in (a), whether one or more of the Majors had a significant share of the permitted reserves.<sup>4</sup>

11.8 Our analysis is set out in Appendix 11.2. We found that there were a minority of counties in England, and regions in Scotland and Wales, where landbanks exceeded seven years and one Major had over 50 per cent of permitted reserves in that area, or two Majors collectively held over 75 per cent of permitted reserves.

11.9 We then compared the overall share of permitted reserves owned by each of the Majors in GB at the end of 2010 with their share of the production of primary aggre-

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<sup>4</sup> Information on permitted reserves and landbanks was taken from AWP reports for 2009; market shares based on BDS data for 2010.

gates in 2011 (see Appendix 11.2, Table 3). We found the shares of permitted reserves and production to be similar. We also analysed the correlation between each Major's share of reserves and its share of production on a county-by-county basis and found that for sand and gravel, the correlation coefficients were over 0.75 for all the Majors and for crushed rock the correlation coefficients were over 0.6 for all the Majors.

11.10 Taken together, these factors indicated to us that the Majors were not holding significant inactive sites of permitted reserves in the landbanks to prevent entry, since the size of each Major's local stock of permitted reserves appeared to be positively correlated to its local share of production. If permitted reserves were being 'warehoused', we might expect to see that the size of a Major's local stock of permitted reserves exceeded its local share of production.

11.11 Notwithstanding the concerns set out in paragraph 11.6(a), the MPA reported that the annual surveys of its members between 2000 and 2008 found that most planning applications for new primary aggregates sites were successful. We also noted that other research indicated that industry participants generally felt that the planning system worked well and that environmental factors were more common reasons for refusing planning permission than the length of the existing landbank.<sup>5</sup> Furthermore, our analysis suggested that in most counties where aggregates were extracted, the landbank recommendations were met, as shown in Appendix 11.2, Annex 1.

*Incentives to produce aggregates at sites where planning permission has been granted*

11.12 We considered whether aggregate producers had an incentive to hold sites with permitted reserves without developing them (or to mothball previously operational

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<sup>5</sup> [www.british-aggregates.co.uk/documentation/doc88.pdf](http://www.british-aggregates.co.uk/documentation/doc88.pdf).

sites) in order to maintain the length of the landbank in an area and prevent a new entrant from gaining planning permission for another site in the same area (see also Appendix 2.1).

11.13 The regulatory framework provides against holding sites with permitted reserves without utilizing them in that LMPAs can make orders prohibiting the resumption of minerals development on land where no such development has been carried out to any substantial extent for a period of at least two years and where, on the evidence available to the LMPA at the time when it makes the order, it appears that development is unlikely to resume to any substantial extent.<sup>6</sup> Sites subject to such prohibition orders are not included in permitted reserves.

11.14 The Majors told us that holding undeveloped sites in a landbank and/or mothballing previously active sites did not make commercial sense for the following reasons:

- (a) Once permission had been granted to operate a quarry, there was in most cases a strong incentive to produce aggregates from the site because often the leasehold arrangements granting permission to quarry materials imposed minimum rents per year regardless of whether aggregates were quarried.
- (b) Given the lengthy and costly process of obtaining planning permission, there was a clear commercial imperative for implementing it as soon as possible to recoup the costs of obtaining it.
- (c) The costs of mothballing a site could be significant, including the cost of making the workforce redundant, rent, security, maintenance and other costs.
- (d) The local geographic scope of aggregates markets made it inefficient to mothball sites and withdraw from local areas.

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<sup>6</sup> Minerals Planning Guidance 4. We noted that the use of these powers will generally involve the payment of compensation to the affected aggregates producer, for 'loss of value', unless these powers are used in agreement with the producer. This suggested to us that these powers are rarely used.

### *The role of aggregates working parties*

11.15 We considered whether AWP provided a mechanism for the exchange of commercial information between their members which might facilitate coordination. The role of AWP is set out in paragraph 2.27 and Appendix 2.1. We were told that AWP drew members from the LMPAs in its region, the aggregates industry (by representation from the MPA, the BAA and the National Federation of Demolition Contractors) and government bodies. The MPA is represented on the AWP by its own officials and by employees of the Majors and small and medium-sized enterprises.

11.16 The Majors told us that the procedures and controls maintained by the AWP prevented the AWP being used as a forum for disclosure or exchange of information between aggregates producers. They said that meetings of the AWP were technical in nature and that commercially sensitive information was not disclosed (data was collated so that information on sales and reserves of any individual operator or for any individual quarry could not be ascertained). Hanson said that the Secretary and Chairman<sup>7</sup> of each AWP set the agenda for each meeting, and these individuals were invariably from LMPAs. Hanson also noted that industry personnel represented a relatively small proportion of those involved in AWP and that members were drawn from smaller producers as well as the Majors. Aggregate Industries said that minutes of the meetings were published on the DCLG website, which was difficult to reconcile with an inappropriate information exchange.<sup>8</sup>

### *Conclusions on the planning regime for land-won aggregates*

11.17 We have already concluded that the length of the planning process limits the competition faced over the medium term by existing aggregates producers from entry by operators developing new sites (see paragraph 6.46). The planning regime also

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<sup>7</sup> Each AWP is chaired by a County Planning Officer or the equivalent, or other independent member.

<sup>8</sup> [Aggregate Industries response to the issues statement](#).

creates incumbency advantages for existing aggregates producers as site extensions are likely to be preferred to new site developments by LMPAs and the planning process for site extensions is generally much shorter and simpler than for new sites (see paragraphs 6.55 and 11.4).

11.18 Our analysis of aggregates landbank data indicates that aggregates producers' shares of permitted reserves in landbanks are in most cases in proportion to their share of supply of aggregates. Further we saw from BAA evidence that the planning system was felt to work well and applications for new primary aggregates sites did not tend to be constrained by landbank considerations (see paragraph 11.11). We note the arguments that holding sites with permitted reserves without developing them (or mothballing previously operational sites) in order to preserve landbanks and prevent competitors obtaining planning permission would not be commercially viable, and the possibility that LMPAs could issue prohibition orders on such sites which would prevent the extraction of aggregates in the future. We also note the new NPPF and planning guidance issued by DCLG helps address these concerns (see Appendix 2.1). Taken together, these factors suggest that planning policy concerning aggregates landbanks is unlikely to be distorting competition in local aggregates markets.

11.19 While some of the detailed ways in which the aggregates planning system functions have the potential to increase market transparency between suppliers, we consider that the procedures adopted by AWP, together with the number of parties and public bodies represented on the AWP, make it unlikely that commercially sensitive information would be exchanged during AWP meetings.

### *Marine, secondary and recycled aggregates*

11.20 Marine, secondary and recycled aggregates are subject to different planning regimes—see paragraphs 2.31 to 2.37 and Appendix 2.1. We noted in paragraph 6.58 that the length of time required to obtain a production agreement for marine dredging creates a barrier to entry in the medium term in a similar way to the extraction of land-won aggregates. We also found that the planning regime was considerably less of a barrier to entry into the production of secondary and recycled aggregates than for primary aggregates as the planning process was typically considerably shorter (see Appendix 6.2).

### ***The aggregates levy***

11.21 Details of the aggregates levy are set out in paragraphs 2.38 to 2.40 and Appendix 2.1. The aggregates levy was introduced in 2002 with the aims of internalizing some of the externalities from quarrying, such as dust, noise, visual intrusion and biodiversity loss and introducing a price incentive to encourage the use of waste, spoil and recycled aggregates.

11.22 The Majors told us that the fact that secondary and recycled aggregates were exempt from the aggregates levy was one of the reasons why these were cheaper to produce than primary aggregates, and so why their share in the overall aggregates market had grown in recent years. They said that recycled and secondary aggregates directly constrained the pricing of primary aggregates.

11.23 Aggregate Industries told us that it was strongly of the view that aggregates taxes and credits distorted efficient production. It said that the aggregates levy had been a barrier to the expansion of primary aggregates and resulted in the favouring of secondary and recycled aggregates over primary aggregates. The BAA made similar points and said that the levy meant it was cost-effective to transport secondary

aggregates further. According to Aggregate Industries, the levy constituted approximately 20 to 25 per cent of the average sales price of aggregates.<sup>9</sup> Wardell Armstrong (an independent mining, minerals and engineering consultancy) estimated that the levy comprised approximately 15 to 20 per cent of the average sale price of aggregates to consumers (net of VAT), with the percentage varying across a range of aggregates products and regions as the levy was applied as a flat rate irrespective of value (see Appendix 11.1, paragraph 26).

11.24 The BAA told us that the Majors were able to cover the cost of the levy with revenue from other areas of their business while the independents could not, and therefore the impact of the levy fell disproportionately on the independents. It also told us that china clay, slate aggregates and shale were classified as secondary aggregates, According to the BAA, these aggregates are known as secondary aggregates because they are supposed to be by-products of another process and are not therefore subject to the levy. However, the BAA noted that the by-products of primary aggregate production, such as crushed fines and scalpings, were subject to the levy. The BAA therefore considered that the levy distorted the market. In our view, the levy is designed to distinguish between primary and secondary aggregates, effectively to encourage the use of aggregate materials that would be produced in any event as by-products of other activities rather than the production of primary aggregates. We consider that it is a matter for HMT and DCLG to ensure that the rules on the application of the Aggregates Levy accurately reflect the intended public policy outcome.

11.25 However, Hanson commented that the exemption of recycled and secondary aggregates from the aggregates levy, together with support for the greater use and production of secondary and recycled aggregates (through the NPPF and other

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<sup>9</sup> See also Appendix 11.1, paragraph 22.

public and regulatory initiatives), was an example of the policy and regulations in place enhancing and directly subsidizing competition, since these materials could be substituted in full for all primary low-grade aggregates.<sup>10</sup>

### *Conclusions on the aggregates levy*

11.26 We recognize that the introduction of the aggregates levy has placed an additional cost on primary aggregates production resulting in an increase in the price of primary aggregates. We also recognize that the effectiveness of the levy in incentivizing the use of secondary and recycled aggregates (which is the primary aim of the levy) might be limited by the extent of substitutability between primary aggregates and secondary and recycled aggregates. However, we conclude that the aggregates levy does not give rise to specific concerns relating to competition, as the effects of the levy on patterns of aggregate use are consistent with—and do not extend beyond—the intended policy aims. While it may be possible that the Majors can cover the cost of the levy from other areas of their business more easily than smaller producers, any potential distortion arising from the different scale and diversity of activities of producers is not a direct consequence of the aggregates levy.<sup>11</sup> The fact that the levy applies in the same way to all primary aggregates producers means that there is no distortion between competitors introduced as a result of the levy.

### ***The EU Emissions Trading Scheme***

11.27 The EU ETS is described in paragraphs 2.54 to 2.60 and Appendix 2.2.

11.28 The EU ETS as a whole, including the changes introduced in Phase III, has implications for companies' costs and production decisions. Several concerns were

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<sup>10</sup> [Hanson's response to the updated issues statement](#), paragraph 18.8.

<sup>11</sup>As with other aspects of policy (eg the planning system), the differential impact of the costs of policy and regulation on small and large producers as alleged by BAA (see Appendix 11.1) is not unique to the aggregates sector. Larger companies have deeper pockets and there is a distribution of different-sized companies in these markets. Even where a large company can more readily fund costs imposed by regulation, its incentives and actions are also affected by those policies. Vertically-integrated companies may have an ability and incentive to cross-subsidize particular stages of production for strategic reasons—we assess the scope for vertical effects in these markets in Section 10.

raised about the potential effects on competition in the GB cement market, as set out in Appendix 2.2 and Appendix 11.1.

- 11.29 It was put to us that because allocations of free EU Allowances were unlikely to be sufficient to cover all emissions, cement manufacturers would need to buy additional allowances. Therefore, producers outside the EU would have a significant competitive advantage relative to EU producers because they did not incur this cost. We were told that as well as the direct cost in purchasing allowances, the use of allowances implied an opportunity cost in cement production. Hanson noted that this cost was volatile and would be driven by exogenous factors (for example, the severity of the winter). It said that the ability to pass this input cost increase through to price depended on the symmetry of market participants. We were told that the policy had encouraged the closure of less carbon-efficient cement plants but could discourage new investment in greenfield plants because of the cost of allowances.
- 11.30 One of the key aspects of Phase III of the EU ETS is the introduction of the partial cessation rule. The Majors told us that this was a change that had important effects regarding imports from outside GB. They told us that the 50 per cent (and 25 and 10 per cent) production thresholds (see Appendix 2.2) provided strong incentives for cement producers in countries where domestic demand was extremely low relative to recent production levels (eg Spain, Greece and the Republic of Ireland—countries that already exported to GB) to export. This was because those cement manufacturers that were not producing at least 50 per cent of their historical clinker production (with thresholds also at 25 and 10 per cent) would have their EU Allowances dramatically reduced (and since the allowances were tradable, their loss would represent a significant loss of revenue).

11.31 We were also told that the partial cessation rule could have an effect on production efficiencies, as there was an incentive to keep all plants open, albeit at a reduced rate of capacity utilization, so as to obtain a full entitlement of EU Allowances.

### *Conclusions on the EU Emissions Trading Scheme*

11.32 We note that the EU ETS is intended to help promote reductions in carbon emissions and so is designed to provide financial incentives to seek efficient production.

Therefore it is consistent with the policy intentions to increase marginal production costs for inefficient plants. In relation to the argument that the ETS creates a distortion in the relative costs of producing cement inside and outside the EU, this could in principle be the case. However, because none of the cement supplied in GB is currently imported into GB from outside the EU, we do not believe that the existence of the ETS is distorting competition in the GB cement market in favour of non-EU producers to a material extent. We consider the impact of the ETS on the incentives to import cement into GB from other EU countries in Section 7.

11.33 We have seen evidence that the way EU Allowances are allocated to cement producers under the ETS, together with the partial cessation rule, create incentives for GB producers to allocate production between their plants in a less efficient way than would otherwise be the case, in order to retain in full their free allocations of carbon allowances. This is because, in a period of under-utilization of capacity, the ETS system may provide incentives to maintain at least 50 per cent (or 25 or 10 per cent) utilization of all plants, rather than (say) mothballing one plant and using another at full capacity. This means that some less efficient plants may continue to operate and that economies of scale from concentrating production at fewer plants are not being realized. These inefficiencies could have the effect of increasing the cost of cement production and ultimately increasing the price consumers pay for cement. As set out in Appendix 11.1, there is some evidence that producers actively take into account

the impact on their EU Allowances in making production decisions. However, we do not have evidence that, even if marginal costs are increased for some producers as a result of these production decisions, this has had a material effect on cement prices. Therefore we reach no decision on whether the incentives for inefficient production created by the ETS partial cessation rules represent a distortion of competition. We are, however, concerned to note that we observe incentives for inefficient production (ultimately resulting in higher carbon emissions than might otherwise be the case), which are generated by the way in which EU Allowances are allocated to cement producers under the ETS and the partial cessation rules.

### ***Carbon Reduction Commitment, Climate Change Agreements and the Climate Change Levy***

11.34 The CRC, CCAg and CCL are described in paragraphs 2.62 to 2.72.

11.35 The CRC does not apply to those carbon emissions already covered by the ETS (eg cement) but covers large aggregate sites. If over 25 per cent of an organization's emissions are covered by a CCAg, it will be exempt from certain aspects of the CRC (cement, ground granulated blast furnace slag and lime producers—among others—are covered by CCAgs but not aggregates producers). DECC told us that this could result in 'differential impacts' within the regulated sector, where an integrated aggregates and cement producer which had a CCAg would be exempt from the CRC, but a stand-alone aggregates company would have to comply with the CRC in full. DECC also told us that it was currently in the process of simplifying the CRC, including changes to the current CCAg exemption rules.<sup>12</sup>

11.36 Cemex told us that, with regard to aggregates, the CRC was an example of environmental legislation that had a greater impact on larger operators and created a greater

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<sup>12</sup> [www.decc.gov.uk/en/content/cms/emissions/crc\\_efficiency/crc\\_efficiency.aspx](http://www.decc.gov.uk/en/content/cms/emissions/crc_efficiency/crc_efficiency.aspx).

barrier to large operators looking to expand than new entrants. It said that the scheme covered organizations whose electricity consumption exceeded 6,000 MWh in the relevant qualification period—which Cemex estimated would apply only to aggregates producers extracting more than 1 million tonnes annually. Cemex's view was that the CRC was unlikely to apply to smaller operators (see Appendix 11.1).

11.37 Aggregate Industries told us that the CRC distorted competition. It noted that large cement producers were exempted from the CRC and small aggregates producers fell below the electricity consumption threshold at which the CRC took effect. Aggregate Industries submitted that this effect would be exacerbated by the new government plan to disapply the CRC rules on the supply of energy to facilities covered by the EU ETS (such as cement plants).

### *Conclusions on the CRC*

11.38 We conclude that these policies and their interaction distort competition in that they have different impacts on different types of producers of the reference products in a manner that is unrelated to the carbon footprint of their operations (ie the intended policy outcome of these regulations). For example, an integrated aggregates and cement producer which had a CCAg would be exempt from the CRC but a stand-alone large aggregates company would have to comply with the CRC in full. This arises because:

- the CRC does not apply to those carbon emissions already covered by the ETS (eg cement operations) but covers large aggregates sites;
- smaller aggregates producers would be exempt; and

- if over 25 per cent of an organization's emissions are covered by a CCAg (which cover, among others, producers of cement but not producers of aggregates), it will be exempt from certain aspects of the CRC.<sup>13</sup>

11.39 The interaction between CCAgs and the CRC appears to increase the costs of some aggregates producers more than others, regardless of the relative efficiencies of producers in terms of carbon emissions per tonne of aggregates produced. This would have led us to find an AEC and to consider whether a remedy was necessary. A remedy would most likely have been a recommendation to DECC that the CCAg exemption be reformed or abolished. However, DECC already proposes to abolish the CCAg exemption from 1 April 2014 under an Order currently before Parliament. In the circumstances it is unnecessary for us to find an AEC or to consider a remedy. We support DECC's proposal for reform.

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<sup>13</sup> The MPA noted that most integrated aggregates and cement companies with cement CCAgs were still involved in the CRC because the potential 'one organization' exemption is difficult to apply to larger businesses which typically have more complex organizational structures. The MPA also noted that the rules of CRC would change on 1 April 2014 with the effect that all energy consumption covered by EU ETS and CCAgs would be completely excluded from CRC, but if the remaining energy consumption of a company/organization met the qualification thresholds for CRC then it would become a full participant. This would be the case even if the emissions from this remaining energy were less than 25 per cent of the total of the company's emissions (the exemption rules were being removed from the scheme). The result of these changes was that the same operations would be covered by the same regulations so there would be a level playing field for companies within the scope of the CRC.

## 12. Provisional findings

- 12.1 As described in paragraph 1.1, on 18 January 2012, the OFT referred the supply or acquisition of aggregates, cement and RMX to the CC for investigation, under sections 131 and 133 of the Act. Section 134(1) of the Act requires us to decide whether ‘any feature, or combination of features, of each relevant market prevents, restricts or distorts competition in connection with the supply or acquisition of any goods or services in the United Kingdom or a part of the United Kingdom’. If the CC decides that there is such a feature or combination of features, then there is an AEC.<sup>1</sup>
- 12.2 For the reasons given in Sections 6, 9, 10 and 11, we did not identify any features giving rise to an AEC in any market in GB for the supply of aggregates or RMX.
- 12.3 For the reasons given in Sections 7 and 8, we concluded that there was a combination of structural and conduct features that gave rise to an AEC in the GB bulk and bagged cement markets.
- 12.4 The structural features are:
- (a) high market concentration;
  - (b) transparency of sales and production shares, wins and losses and customer–supplier relationships;
  - (c) high barriers to entry (including limits to the constraint imposed by imported cement);
  - (d) homogeneity of product;
  - (e) customer characteristics and behaviour (in particular, regularity of purchases, purchases at fixed locations, concentration of customer base and single sourcing for a particular job site); and

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<sup>1</sup> [Section 134\(2\)](#) of the Act.

- (f) vertical integration from cement into downstream operations.
- 12.5 The conduct features, the individual significance of which vary over time, are:
- (a) a strategic focus on maintaining market stability between the members of the coordinating group, frequently manifested in a focus on maintaining existing (or returning to pre-existing) relative shares of sales;
  - (b) price announcement behaviour (which facilitates price leadership and price following, and softens customer resistance to price increases);
  - (c) tit-for-tat behaviour used to balance shares and for retaliation;
  - (d) use of cross-sales as a mechanism for transparency, signalling and, on occasion, share balancing and retaliation; and
  - (e) attempts to target importers beyond normal competition on price and service.
- 12.6 These structural and conduct features combine together to give rise to an overarching feature in the GB cement markets, namely coordination among Cemex, Hanson and Lafarge.
- 12.7 The likely effect of these features is higher prices of cement in GB than would otherwise be the case for all GB cement users, whether this cement is ultimately sold through independent RMX and concrete producers, independent merchants or through the downstream businesses of the Majors.
- 12.8 We also found that Lafarge Tarmac's exclusive agreements with the GB steel producers for the production of GBS, and Hanson's exclusive long-term contract with Lafarge Tarmac for the production of GGBS, in combination with Lafarge Tarmac's and Hanson's participation in the GB cement markets, were features that gave rise to an AEC in the GB cement markets, also resulting in higher prices for cement than might otherwise be the case.

12.9 We considered there to be a material customer detriment arising from high cement prices. Using one of several possible approaches to quantifying this detriment (which was based on our profitability analysis and which we considered to be reasonable) indicated that this detriment was of the order of £180 million over the period from 2007 to 2011. However, there are several reasons that we considered this figure likely to be an underestimate of the actual detriment arising. These reasons include the short-term impact on profitability arising from the cement producers' adjustment to the recent large reduction in cement demand and the possibility that detriment may manifest itself through the ongoing inefficiency of some suppliers rather than through high profitability. We expect to refine our estimate of the detriment in the context of our work on remedies.