

# Anticipated acquisition by Clariant of certain assets of Kilfrost

Provisional findings report

Notified: 19 May 2016

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The Competition and Markets Authority 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 [Some numbers have been replaced by a range.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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### Glossary

## Summary

1. On 17 February 2016, the Competition and Markets Authority (CMA), in exercise of its duty under section 33(1) of the Enterprise Act 2002 (the Act), referred the anticipated acquisition by Clariant AG (Clariant)<sup>1</sup> of the European aircraft de-/anti-icing fluid (ADF) business, the rail de-/anti-icing fluid business and associated assets (the Target Business) from Kilfrost Group Public Limited Company (Kilfrost) (altogether the Merger) for further investigation and report by a group of CMA panel members (Group). Throughout this report, where relevant, we refer to Clariant and Kilfrost collectively as the Parties.
2. Clariant is a Swiss-based global specialty chemicals company with a turnover of CHF 5.8 billion (£3.9 billion)<sup>2</sup> in financial year ending 31 December 2015. Clariant supplies the aviation sector with a number of products, including ADF and runway de-icing products. It began selling ADF in the UK in 2012 when it won two large supply contracts.
3. Kilfrost is a family owned UK-based supplier of ADF and rail de-icing fluids. Its turnover in the 18 months to 31 March 2015 was £75 million. Kilfrost's headquarters and main manufacturing facility are in Haltwhistle near Newcastle upon Tyne, from which it serves customers, mainly in the UK and the European Economic Area (EEA). Prior to August 2015, it also operated in North America and Asia.
4. There are three types of ADF that are used in the UK (and the EEA): Type I, Type II and Type IV.<sup>3</sup> Type I is used only for de-icing aircraft (the removal of frost, ice, slush or snow), while Types II and IV can be used for both de-icing and anti-icing (the protection against the formation of frost or ice and accumulation of slush or snow), as they contain thickeners to increase their viscosity. Before they can be sold commercially, ADF products and the facilities in which they are manufactured need to be certified in accordance with SAE International's standards.
5. Aside from Clariant and Kilfrost, one other supplier sells ADF in the UK: Belgium-based Proviron. A French company, ABAX, also supplied in the UK until the end of the winter season 2013/14. Other suppliers in the EEA are

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<sup>1</sup> Through its subsidiaries, Clariant International AG, Clariant Produkte GmbH (Deutschland) and Clariant Production UK Limited.

<sup>2</sup> Unless otherwise indicated, currency conversions are based on Bank of England published spot prices for the relevant period. Conversions should be treated as indicative only.

<sup>3</sup> Type III is used in Canada and Russia but not in the EEA, because it uses monoethylene glycol.

LNT Solutions Limited (LNT Solutions) and ADDCON Europe GmbH (ADDCON).

6. The sale of Kilfrost's business involved a formal bidding process that took place in summer 2015, at the end of which Clariant agreed to purchase customer contracts, some intellectual property (IP) rights and limited operating assets (but not the factory or employees) relating to the ADF and railway de-icing operations of Kilfrost. The acquisition was implemented as a staggered transaction, with the first phase consisting in the North American and Asian operations and completing in August 2015. The second phase was for the European operations and resulted in an Asset Purchase Agreement being signed in Autumn 2015. Only the second phase (the Merger) was subject to regulatory approvals. We are satisfied that this Merger, if completed, will create a relevant merger situation.
7. In order to identify the relevant market within which to examine the competitive effects of the Merger, we first defined the product market before examining issues relating to geographic market definition:
  - (a) The assessment of the relevant product market starts with the products of the merging parties: both Clariant and Kilfrost supply ADF of Type I, II, and IV to customers in the UK. There are however no overlaps between the Parties in relation to rail de-icing and having made some preliminary enquiries, we focused our investigation on the other elements of the Target Business, ie the supply of ADF of Type I, II, and IV.
  - (b) We sought evidence from customers about the substitutability of different types of ADF and found that ADF products are largely complementary. However, we also found that although there are some exceptions, customers tend to buy all the types of ADF they require from the same supplier. Although two of the suppliers currently supply only Type I ADF in the EEA, they are in the process of obtaining certifications for Types II and IV. The other suppliers with sales in the EEA are able to offer the three relevant types of ADF to customers. In addition, we were informed by suppliers that although the tanks in which ADF products are made are dedicated to a given type of ADF, they can be easily and quickly re-allocated to the production of another type, although they would typically do this at the beginning of a winter season. We therefore provisionally conclude that the relevant product market comprises all types of ADF that are certified for use in the EEA.
  - (c) In order to define the geographic market, we considered three factors: the characteristics of ADF products, including the types of products that can be used in different geographies; customer requirements and supply-side

issues, including the extent to which local operations are necessary; and at what distance suppliers can profitably sell their products. We provisionally conclude that there are no clear boundaries to the geographic market, but that it is unlikely to be wider than the EEA, while there are also local aspects of competition resulting from a combination of each customer's specific requirements and each supplier's ability to meet those requirements which indicate that the geographic market may be narrower than the EEA.

8. We therefore provisionally conclude that the relevant market in which to assess the competitive effects of the Merger is the market for ADF products in the EEA, recognising that there are local variations in the competitive constraints faced by the Parties in different parts of the EEA, which are taken into account within the assessment of the competitive effects of the Merger, as they relate to UK customers.
9. Before turning to our analysis of the competitive effects of the Merger, we considered what would have happened to Kilfrost in the absence of the Merger (the counterfactual). To reach a view, we examined three possible scenarios: whether Kilfrost would have continued to operate independently; whether it would have been acquired (either in whole or in part) by an alternative purchaser; and whether it would have exited the market. In order to make this assessment, we obtained evidence from the Parties, the advisers to Kilfrost and the potential purchasers that had made indicative offers. Based on this evidence, we provisionally conclude that the most likely counterfactual to the sale of Kilfrost to Clariant would have been its acquisition by an alternative purchaser which would have continued to supply ADF within Europe including the UK. We have therefore analysed the competitive effects of the Merger against the pre-merger conditions of competition.
10. We next turned to the assessment of the effects of the Merger on competition. We first examined the nature of competition before the Merger, and in particular the requirements that customers have in relation to ADF, the nature of contractual arrangements, competitive processes and switching issues.
11. We provisionally conclude that the two key dimensions of competition are price and security of supply. In addition, to be credible, the supplier must also have a product that meets the required quality standards (ie internationally recognised certifications and approvals). In terms of processes, customers either simply renew their contracts with their current supplier following a renegotiation, or seek alternative quotes, either formally or informally. Even though demand for ADF is relatively inelastic and customers' willingness to pay is high, prices are constrained through a number of mechanisms, including:

- (a) Where they have credible options, customers seek to obtain better prices through negotiations, either informally or through formal tenders, and we have seen evidence that this has resulted in lower prices.
  - (b) In particular we have seen evidence that customers have been able to achieve better prices by playing off Clariant and Kilfrost.
  - (c) Some customers have taken steps to increase the options they have available (for example, by dual sourcing) although customers have a limited ability to use such strategies.
12. Against this background, we considered whether, following the Merger, Clariant would have the ability and incentive to increase the price of ADF (or to submit less attractive bids) or otherwise worsen other elements of its offering (including security of supply), compared with its and Kilfrost's pre-Merger offerings. As part of this assessment, we obtained evidence on the competitive positions of the Parties and other ADF suppliers with operations in the EEA. We also sought the views of customers on the overall offerings of suppliers, including the Parties, and examined in more detail evidence relating to the product range and quality (including innovation), cost management and supply chain management of these suppliers. Our main provisional findings are that:
- (a) Clariant and Kilfrost are the two largest suppliers of ADF, not only in the UK where their share of supply exceeds 90%, but also in the EEA, and perhaps globally. In the EEA, the Parties' share of supply is well in excess of 80% and between them they hold most of the large customer contracts (including in the UK).
  - (b) The Parties regard each other as close competitors and we have seen extensive evidence of intense competition between them, at least for large contracts both in the UK and the EEA. When the Parties compete, it is across all aspects of their offering.
  - (c) The combination of long-term track records in the supply of ADF and extensive and well-established logistics infrastructures, which demonstrates their ability to meet security of supply requirements, together with their large customer bases give both Kilfrost and Clariant significant competitive advantages over competitors.
  - (d) The offerings of ADF suppliers are differentiated and consist of a number of elements that comprise the ADF product itself, price and other contract terms, additional services and non-price elements. Other ADF suppliers are viewed by customers in the UK as less credible than the Parties across all aspects of their offerings. They also have significantly more

limited geographic footprints, and have not (yet) been able to establish a large customer base or logistical infrastructure, or to prove their ability to deliver ADF reliably in difficult weather conditions.

13. Finally, we considered whether it was likely that timely and sufficient entry or expansion by other suppliers might prevent a substantial lessening of competition (SLC). In the light of the significant barriers to entry we identified (in particular: evidence of a good track record of delivery under any weather conditions; the risks and costs of putting in place an appropriate infrastructure before winning sizeable contracts; and the risks and costs of holding large stocks of product) and the lack of credibility of suppliers other than Kilfrost and Clariant in the UK, we provisionally conclude that expansion by any of the existing suppliers (ie Proviron, ABAX, LNT Solutions and ADDCON) would be unlikely to occur at sufficient scale or within a short enough timescale to mitigate the effects of the loss of Clariant's closest competitor in the supply of ADF to UK customers.
14. In view of the above, we provisionally conclude that the proposed acquisition of certain assets of Kilfrost by Clariant may be expected to result in an SLC in the market for the supply of ADF in the UK. We expect that following the Merger, Clariant would have an incentive to increase prices and/or worsen non-price aspects of its offering (including security of supply). We consider that there is a particular risk of price increases given that the price sensitivity of customers is relatively low.

## Provisional findings

### 1. The reference

- 1.1 On 17 February 2016, the Competition and Markets Authority (CMA), in exercise of its duty under section 33(1) of the Enterprise Act 2002 (the Act), referred the anticipated acquisition by Clariant AG (Clariant)<sup>4</sup> of the European aircraft de-/anti-icing fluid (ADF) business, the rail de-/anti-icing fluid business and associated assets (the Target Business) from Kilfrost Group Public Limited Company (Kilfrost) (altogether the Merger) for further investigation and report by a group of CMA panel members (Group).
- 1.2 In exercise of its duty under section 36(1) of the Act, the CMA must decide:
- (a) whether arrangements are in progress or in contemplation which, if carried into effect, will result in the creation of a relevant merger situation; and
  - (b) if so, whether the creation of that situation may be expected to result in an SLC within any market or markets in the UK for goods or services.
- 1.3 Our terms of reference are in Appendix A. We are required to publish our final report by 3 August 2016.
- 1.4 This document, together with its appendices, constitutes our provisional findings, published and notified to Clariant and Kilfrost in line with the CMA's rules of procedure.<sup>5</sup> Further information relevant to this inquiry, including non-confidential versions of the submissions received from Clariant and Kilfrost, as well as summaries of evidence received in oral hearings, can be found on our [webpages](#).
- 1.5 Throughout this document, where relevant, we refer to Clariant and Kilfrost collectively as the Parties.

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<sup>4</sup> Through its subsidiaries, Clariant International AG, Clariant Produkte GmbH (Deutschland) and Clariant Production UK Limited.

<sup>5</sup> [CMA rules of procedure for merger, market and special reference groups \(CMA17\)](#), Rule 11.

## 2. The companies and the industry in which they operate

### **Clariant**

- 2.1 Clariant AG is a Swiss-based global specialty chemicals company. It is listed on the SIX Swiss stock exchange. It has a market capitalisation of CHF 5.29 billion (£3.8 billion).
- 2.2 Clariant was formed in 1995 as a spin-off from the chemical company Sandoz. It has seven business units: Additives, Catalysts, Functional Minerals, Industrial & Consumer Specialties (ICS), Masterbatches, Oil & Mining Services, and Pigments.
- 2.3 Clariant had a turnover of CHF 5.8 billion (£3.9 billion) in FY2015,<sup>6</sup> (CHF 6.116 billion (£4.0 billion) in FY2014).
- 2.4 Within its ICS business unit, Clariant supplies a number of industries, one of which is the aviation industry, to which it supplies aircraft de/anti-icing and runway de-icing products among other things. In FY2015, ICS achieved sales of CHF 1.4 billion (£1.0 billion), of which worldwide sales of ADF accounted for CHF [X] million (£[X] million) in FY2015.
- 2.5 In Europe, sales of ADF in 2015 were CHF [X] million (£[X] million). Its main ADF manufacturing facility is in Gendorf in Germany. Clariant told us that it has [X].
- 2.6 Clariant began selling ADF in the UK in 2012 when it won two supply contracts, which it serves from [X].<sup>7</sup> Sales of ADF in the UK in the past four years were £[X] million, £[X], £[X] million, and £[X] million<sup>8</sup> in FY2012/13, 2013/14, 2014/15, and 2015/16 respectively.

### **Kilfrost**

- 2.7 Kilfrost is a family owned UK-based manufacturer and distributor of anti- and de-icing products to the civil aviation and transportation industries. It has been in operation since the 1930s.
- 2.8 Kilfrost has two major divisions: (1) Kilfrost's Winter Division which manufactures and distributes de- and anti-icing products to the aviation (ADF), rail (rail de-icing fluids) and ground de-icing sectors; and (2) Kilfrost's Speciality Fluids Division which produces a wide range of inhibited glycol-

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<sup>6</sup> Financial Review Full year / Fourth quarter 17 February 2016 (unaudited). Year end is 31 December. See [its website](#).

<sup>7</sup> Clariant has two subsidiaries in the UK: Clariant Services UK Ltd (a holding company) and Clariant Production UK Ltd (CPUK), which purchases, warehouses and distributes traded products. [X]

<sup>8</sup> CHF [X] million.

based heat transfer fluids that are used in heating, cooling and industrial applications as well as general ground de-icing products.

2.9 Kilfrost's headquarters and main manufacturing facility are in Haltwhistle near Newcastle Upon Tyne, UK. Prior to [X] August 2015, Kilfrost also operated in North America and China.

2.10 During the past five years, Kilfrost has experienced volatile trading due to variations in seasonal conditions (both mild winters and very cold winters). During this period, Kilfrost also saw a rapid expansion in its North American operations and entered China. Table 1 shows the performance of Kilfrost over this period.

**Table 1: Kilfrost performance from September 2011**

	£'000			
	12 months to 30 September 2011	12 months to 30 September 2012	12 months to 30 September 2013	18 months to 31 March 2015
Turnover	54,930	39,143	62,614	75,211
Gross profit	14,415	6,715	12,711	6,935
Operating profit/(loss)	6,715	(1,227)	4,363	(3,949)

Source: Kilfrost's statutory accounts.

2.11 In the 12 months to 30 September 2013 Kilfrost's UK and European turnover was £46.8 million, and in the 18 months to 31 March 2015, it was £36 million. In the winter season 2012/13, 2013/14, 2014/15 and 2015/16, Kilfrost's UK ADF turnover was £[X] million, £[X] million, £[X] million and £[X] million respectively.

2.12 Further details of Kilfrost's background and financials are included in Appendix B.

### ***The products***

2.13 ADF is used for two purposes:

- (a) the de-icing of aircraft: the removal of frost, ice, slush or snow from an aeroplane in order to provide clean surfaces; and
- (b) the anti-icing of aircraft: the protection against the formation of frost or ice and accumulation of slush or snow on treated surfaces of the aeroplane for a limited period of time (holdover time).

2.14 ADF falls into four different categories: Types I, II, III and IV. All types of ADF contain glycol mixed with various amounts of water and additives. The glycol compound used is either monopropylene glycol (MPG) or monoethylene glycol (MEG).

- 2.15 ADF can be sold at different concentration levels – either in ‘concentrated form’ (ie glycol, water and additives blended together), which may require dilution by the customer for certain applications, or in ‘pre-mixed’ form where the supplier carries out that dilution for the customer in advance. Kilfrost told us that [✂].
- 2.16 ADF can be used in the following ways:<sup>9</sup>
- (a) Type I, whether it is sold as ‘pre-mixed’ by the manufacturer or as a concentrate to be diluted with water on site, is typically used for de-icing<sup>10</sup> the aircraft. It can however also be used for anti-icing purposes if heated at a minimum temperature of +60°C, with the same temperature being considered desirable for de-icing purposes. Type I fluids contain 80% glycol and 18 to 19% water, with some additives. They do not contain any thickeners and therefore will run off the wing surfaces after a certain time leaving only a marginal protective layer, which is seldom sufficient for prolonged protection. It is the heat of the mixture and spray pressure rather than any chemical reaction that makes the fluid suitable for de-icing. Type I fluids supplied as concentrate (ie with a mixing ratio of 100%)<sup>11</sup> for dilution with water prior to use are not used undiluted.
  - (b) Types II, III and IV contain thickeners to increase their viscosity and therefore holdover time.<sup>12</sup> They are therefore particularly suited to anti-icing. They contain a minimum of 50% glycol and 48 to 49% water, with some additives. Thickened fluids are in general not heated when used as anti-icing fluids, as heat will diminish the viscosity of the products. For anti-icing, mixtures with a stated mixing ratio of 100%, 75% or 50% can be used. If diluted below these levels and heated, thickened fluids can be used for de-icing, but the AEA recommends that de-icing should be performed with Type I fluid to avoid residue problems.<sup>13</sup>
- 2.17 As the use of MEG in ADF is prohibited in Europe for environmental reasons, Type III ADF is not supplied in the EEA. In the remainder of the document, the term ‘ADF’ therefore refers to Types I, II and IV only and the term ‘thickened fluids’ to Types II and IV only.

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<sup>9</sup> Association of European Airlines (AEA) (2015), [Recommendations for De-icing/Anti-icing Aeroplanes on the Ground](#) and [Training Recommendations and Background Information for De-icing/Anti-icing of Aeroplane on the Ground](#).

<sup>10</sup> Heated water can also be used for the de-icing of aircraft.

<sup>11</sup> 100% means the product is a concentrate, not that there is no water content. Lower percentages, eg 75% indicate that the concentrate has been further diluted.

<sup>12</sup> Holdover time is the estimated time for which an anti-icing fluid will prevent the formation of frost or ice and the accumulation of snow on the protected surfaces of an aeroplane, under weather conditions – AEA (2015), [Recommendations for De-icing/Anti-icing Aeroplanes on the Ground](#).

<sup>13</sup> AEA (2015), [Recommendations for De-icing/Anti-icing Aeroplanes on the Ground](#).

- 2.18 ADF suppliers' products and manufacturing facilities must meet certain standards before they can be used.
- 2.19 The International Organization for Standardization's (ISO) Standard 11075:2007 defines the requirements for Type I fluids while Standard 11078:2007 defines the requirements for Types II, III and IV fluids. These standards correspond to SAE International's Aerospace Material Specifications (AMS 1424 and 1428).<sup>14</sup> This certification process is valid for the supply of ADF in the whole of Europe and North America, and much of the rest of the world (Russia and China operate domestic certification regimes).<sup>15</sup>
- 2.20 In order to meet these standards, the ADF product must undergo tests of the anti-icing and aerodynamic performance of the fluid ('AMIL testing'), of the physical properties of the fluid ('SMI testing') and holdover testing ('APS testing').<sup>16</sup>
- 2.21 Additionally, certification and approval of ADF is undertaken for each production site. If a production site is changed, the manufacturer would need to seek re-certification. Periodic re-certification is also undertaken according to SAE International requirements. See Appendix C for further detail on ADF testing and certifications.
- 2.22 Individual airlines maintain their own lists of ADF products which they approve for use on their aircraft – typically based on whether or not the products meet the criteria set out above.
- 2.23 Some airports undertake their own testing of each ADF batch to ascertain the viscosity, percentage of glycol, and other properties of the product.
- 2.24 More information on the products and their application can be found in Appendix C.

### ***Other ADF suppliers***

- 2.25 Aside from Kilfrost and Clariant, there are four ADF suppliers currently serving customers in the EEA and a number of potential ADF suppliers, which we briefly describe in paragraphs 2.26 to 2.31 below.
- 2.26 ABAX Industries SPCA (ABAX) is a France-based producer of hygiene and industrial cleaning products, as well as ADF. ABAX told us that its total turnover is generally between €15 million and €20 million (but can be up to

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<sup>14</sup> See [ISO 11075:2007](#) and [ISO 11078:2007](#).

<sup>15</sup> [Clariant initial submission](#), paragraph 9.18.1, [Kilfrost initial submission](#), footnote 3.

<sup>16</sup> [Clariant initial submission](#), paragraph 9.11 & 9.12.

€35 million when the winter is harsh) (£12 million and £16 million, up to £28 million). Over [ ]% of this turnover is generated from sales in France. ABAX supplies Types I, II and IV ADF from its manufacturing facility in France.

- 2.27 Proviron Functional Chemicals NV (Proviron) is a Belgian chemicals manufacturer and supplies Types I, II and IV ADF under licence from Cryotech (a US ADF manufacturer), from its manufacturing facility in Belgium.<sup>17</sup> Proviron told us that it has a total annual European turnover of approximately €170 million (£134 million).
- 2.28 ADDCON Europe GmbH (ADDCON) is a manufacturer of Type I ADF only, as well as runway de-icer, food products, feed additives and oil-drilling fluids. ADDCON's ADF production is carried out from manufacturing sites in Germany and Norway. ADDCON told us that its total turnover ranges from €60 million to €100 million (£47 million to £79 million) depending on weather.
- 2.29 LNT Solutions primarily supplies ADF, runway de-icing fluid and rail track adhesion products. It also supplies related retail products for facility management. LNT Solutions is active in the UK, Europe, the USA and Canada. LNT Solutions sells Type I ADF in Europe and Type I ADF and additives to make Type I ADF in North America from a manufacturing facility located in Germany. The turnover of LNT Solutions is approximately £9 million per year.
- 2.30 Boryszew SA (Poland) is seeking to supply ADF in the EEA by offering a Chinese ADF product but to our knowledge, has not won any contracts in the EEA to date.
- 2.31 There are also a number of ADF suppliers operating outside the EEA. These include AllClear Systems LLC (USA, Types I and III), Deicing Solutions LLC (USA, Type I), Dow Chemical Company (USA, Types I and IV) and Cryotech Deicing Technology (USA, Types I and IV).

### ***The supply chain***

- 2.32 ADF comprises three inputs: MPG, additives and water, blended together to create a finished product or 'concentrate' which can then be diluted further. The product is transported and stored at or close to customers' locations.

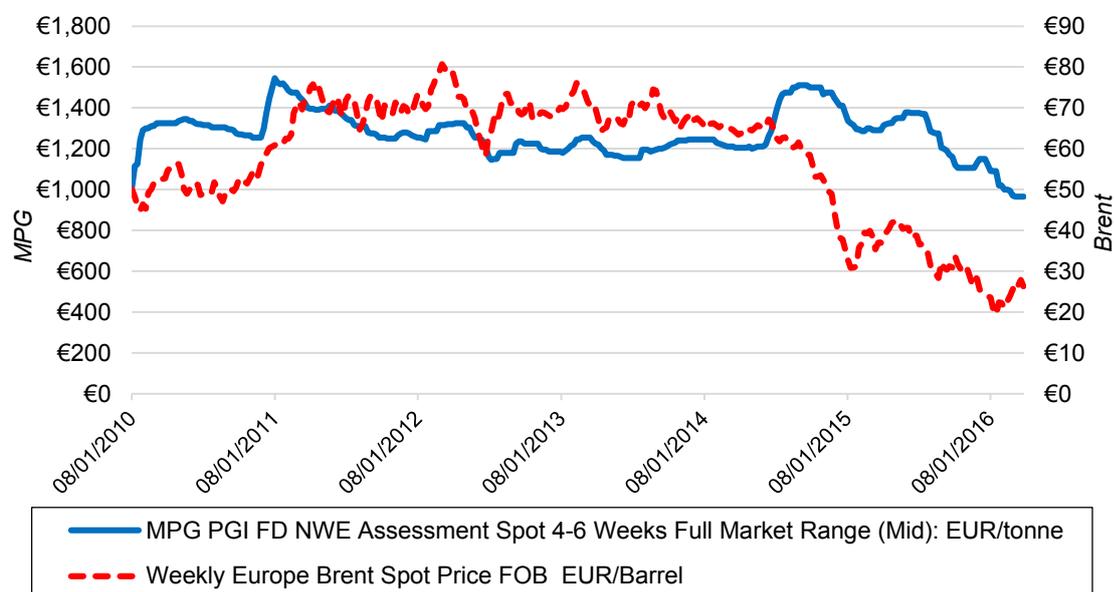
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<sup>17</sup> [Proviron hearing summary](#), paragraph 4.

## MPG supplies

- 2.33 MPG is a petroleum based product used for various applications. There are two grades of MPG: 'technical' grade and 'food/pharmaceutical' grade. The main fields of application for technical grade MPG are unsaturated polyester resins, paints, detergents and antifreeze products. For food grade MPG, the main field of application is in cosmetics, where it is used as a moisture regulator. In 2012, European propylene glycol production capacity amounted to around 730 kilotonnes. Of this, approximately one-third was used for pharmaceutical grade and two-thirds are used for industrial (or 'technical') grade propylene glycol.<sup>18</sup>
- 2.34 There are five suppliers of MPG in the EEA: BASF SE (BASF), Dow Europe GmbH (Dow), Ineos Manufacturing Deutschland GmbH (Ineos), LyondellBasell Industries (LyondellBasell) and Repsol Quimica, S.A (Repsol).<sup>19</sup>
- 2.35 MPG represents the largest share of costs of ADF. Depending on the type of ADF, this may range between around [40–50]% and [80–90]%. This is also the cost factor with the greatest degree of variation as it is somewhat linked to the oil price (see price chart below in Figure 1).

**Figure 1: ICIS MPG and Brent oil price chart (2010 to 2015)**



Source: ICIS index as submitted by Clariant, Brent Spot price: Intercontinental Exchange

<sup>18</sup> [www.propylene-glycol.com](http://www.propylene-glycol.com) (retrieved 15/04/2016).

<sup>19</sup> See *Propylene Oxide / Propylene Glycols Sector Group: Guidelines for Handling and Distribution of Propylene Glycol USP / EP* (retrieved 15/04/2016) although this relates to pharmaceutical grade MPG. Shell Chemicals Europe BV stopped selling MPG in Europe in 2014.

- 2.36 MPG manufacturing plants in the EEA are at the following locations: Ineos: Cologne (Germany), LyondellBasell: Fos-sur-Mer (France), Rotterdam and Botlek (Netherlands), Dow: Stade (Germany), BASF: Ludwigshafen (Germany) and Antwerp (Netherlands), Repsol: Tarragona (Spain).
- 2.37 MPG is mainly sold on the spot market, but a number of ADF suppliers buy on a contract basis. This can be through long-term supply contracts (up to [X] years) with a pricing formula based on cost/market index or prices can be freely negotiated on a [X] basis. [One supplier] told us that some contracts for MPG are undertaken on an ad-hoc or monthly negotiated basis. Other contracts may last [X] years based on a cost plus or market minus model.<sup>20</sup> We are aware of one other MPG supplier operating on the basis of seasonal contracts when dealing with ADF suppliers. See Appendix D for further details about arrangements for MPG supply.
- 2.38 Some ADF suppliers [X] engage in multiple-sourcing for MPG, while others buy entirely [X] from one MPG producer only.
- 2.39 During the winter of 2010/11, very cold weather saw a shortage of MPG in Europe. As a consequence, ADF suppliers struggled to supply their customers. In France, the shortages led the government to requisition ABAX's ADF manufacturing facilities on 23 December 2010.<sup>21</sup>

#### *Additives and water*

- 2.40 Additives and water are the other raw materials used in the production of ADF.
- 2.41 Water accounts for between [10–20]% and [50–60]% by volume in ADF concentrate, depending on the type. Additional water can be added for dilution to reduce the quantity of ADF used at higher temperatures.
- 2.42 The additives consist of a mixture of liquid and solid substances and represent around [0–5]% to [20–30]% by volume in ADF concentrate, depending on the type. These provide for the required chemical and physical characteristics of the different ADF types, including: viscosity, surface tension, wetting ability, anti-foam capacity, corrosion inhibition, and colouring for identification. The additives are usually provided with a certain amount of MPG and water (sometimes called an 'add pack') to facilitate the production of the finished (concentrate) product.

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<sup>20</sup> [X]. Also for its production in the UK, Kilfrost buys [X].

<sup>21</sup> Conseil général de l'Environnement et du Développement durable – [Fonctionnement de l'aéroport Paris – Charles de Gaulle lors de l'épisode neigeux des 23 et 24 décembre 2010](#).

2.43 Additives play a major role in the production of Types II and IV to achieve the necessary properties in these ADF products. The exact ingredients and formulations of the additives are commercial secrets kept by the manufacturers.

### *Manufacture*

2.44 The manufacturing process is a simple one: according to Clariant, ‘the product is unsophisticated in technical terms’<sup>22</sup>; ‘there is no complex chemical process (but simply a mixing of ingredients), it is easy to produce’.<sup>23</sup>

2.45 The main production stage is the mixing of ingredients. The product is then decanted into bulk storage tanks, road tankers, or ISO tank containers (commonly around 23,000 litres) and intermediate bulk containers (IBCs) (commonly around 1,000 litres) for transport. Production and decanting happens at ambient temperatures under atmospheric pressure and there are no complex chemical reactions or special safety precautions to be taken.

2.46 The ADF suppliers either carry out this process in-house or may subcontract to toll manufacturers in some geographies. For example, Clariant manufactures ADF in Europe at its sites at Gendorf (Germany), Uddevalla (Sweden), [REDACTED], and through toll manufacturers in Rauma (Finland) and Moscow (Russia). Kilfrost supplies UK customers of ADF from its site in Haltwhistle (UK) and also supplies Type I to customers in Europe from a toll manufacturer’s site in Antwerp (Belgium). LNT Solutions manufactures ADF and runway [REDACTED].<sup>24</sup> ADDCON manufactures ADF at its own sites in Bitterfeld, Germany and in Norway. ABAX manufactures ADF at its own site near Paris.

2.47 For ADF supply, toll manufacturing involves blending MPG, water and additives in the relevant proportions. As far as we are aware, there are currently no businesses undertaking ADF toll blending activities in the UK.

### *ADF distributors*

2.48 Esseco told us that it supplied ADF in the UK until 2013. Esseco bought ABAX’s Type II ADF, transported it to the UK where it sold it to UK customers.<sup>25</sup> We are not aware of any other ADF distributors in the UK. Clariant told us that it used a local distributor in some parts of Eastern Europe

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<sup>22</sup> [Clariant response to issues statement](#), p3.

<sup>23</sup> [Clariant initial submission](#), paragraph 1.3.

<sup>24</sup> [LNT Solutions hearing summary](#), paragraph 8.

<sup>25</sup> [Esseco hearing summary](#), paragraph 1.

[REDACTED]. Clariant also used an approved distributor for one particular client in [REDACTED], due to the client's preferences.

### *Transport by logistics providers*

- 2.49 ADF is mainly transported either in 23,000 litre ISO containers or 1,000 litres IBCs.
- 2.50 ADF suppliers contract logistics providers to deliver ADF from the manufacturing site to the customer, or to one of the supplier's depots (see paragraph 2.54 below). Kilfrost told us that it used [REDACTED]. Clariant said it used [REDACTED].
- 2.51 To our knowledge, no ADF supplier in the EEA carries out its own transportation.

### *Storage*

- 2.52 Due to the highly variable and seasonal nature of demand for ADF, together with contractual requirements in terms of delivery times, the management of stocks is an important consideration for suppliers.
- 2.53 Once manufactured and transported, ADF is stored at one of the supplier's depots or at the premises of the customer.
- 2.54 ADF suppliers have one or more depots where they keep stocks of ADF for later delivery and use by their customers.<sup>26</sup> We understand that ADF suppliers would usually not own the tank containers in which the ADF is stored but instead rent these at a certain cost per day from logistics contractors. Similarly, they may rent storage space for such a tank container from a logistics company at one of their terminals or yards. This service would entail a daily charge as well as a handling charge for moving the container in and out, both to be paid by the ADF supplier.
- 2.55 ADF is also stored at customers' premises at airports, and the quantities held vary widely from airport to airport. These stocks are typically held on consignment by the ADF supplier. Storage space is often at a premium at large airports, so this acts as an on-site supplement to stocks held elsewhere. Small airports on the other hand may be able to hold most of their requirement on site, often in IBCs.

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<sup>26</sup> We understand that this is the most common way of operation. An ISO container would usually contain 23,000 litres of fluid. Storage in bulk storage tanks or IBCs (containing around 1,000 litres of fluid) are alternative containers for storing ADF.

2.56 While not an ADF customer itself, London Heathrow Airport also holds large contingency stocks of ADF [✂] from the ADF supplier.<sup>27</sup>

### **ADF customers**

2.57 ADF is bought by airports, airlines, ground handlers and defence customers.

2.58 Airports buy ADF where they provide de-icing services to airlines directly. We understand that most UK airports do not operate in this way, though the practice is more common elsewhere in Europe. For example, [✂] is a major customer of Kilfrost. Airports are covered by the EU Utilities Directive, so must put contracts out to a formal tendering process.<sup>28</sup>

2.59 In some cases, airlines handle their own de-icing services (such as British Airways (BA) at London Heathrow Terminal 5 and Eastern Airways at Newcastle Airport), though they usually outsource this to specialist ground handlers.

2.60 Ground handlers provide a number of services to airlines. These may include cabin cleaning, passenger services, luggage handling, towing, refuelling and de-icing. In the UK, ground handlers account for a large share of ADF purchased.

2.61 Defence customers may also buy ADF. For example, the UK Ministry of Defence purchases a unique ADF product for its own use. The volumes involved are small as a proportion of ADF sold in the UK.<sup>29</sup>

2.62 The chart below shows the distribution of contract sizes in the UK.

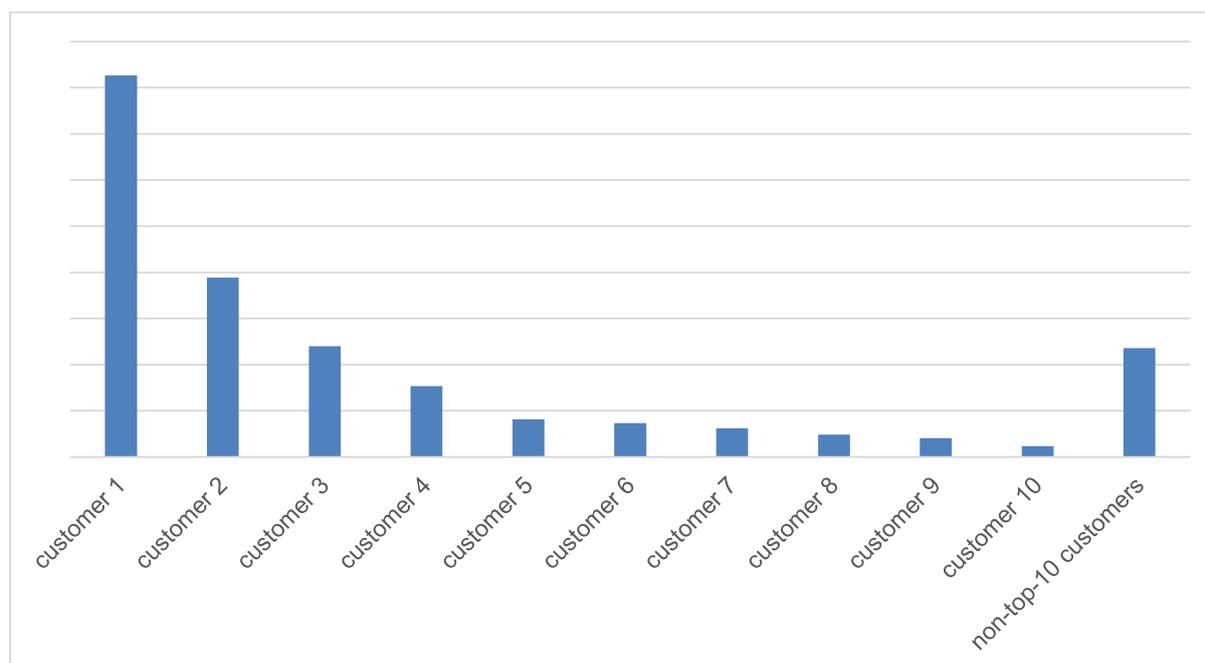
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<sup>27</sup> Clariant initial submission, paragraph 1.6.4.

<sup>28</sup> Clariant initial submission, paragraph 7.9

<sup>29</sup> Clariant initial submission, paragraph 1.7 and Kilfrost initial submission, paragraph 4.6.

Figure 2: Chart showing ADF contract sizes in the UK (2015/16)\*



Source: Data from the Parties.

\* [REDACTED], [REDACTED], and [REDACTED] are now under common ownership. We treat them as three separate contracts here.

2.63 The top three ADF customers in the UK by value are [REDACTED] and [REDACTED]. Together they account for [70–80]% of sales.

2.64 Elsewhere in the EEA customers fall into the same categories, though airports are more likely to supply aircraft de-icing services directly to airlines, so account for a greater proportion of the ADF purchased.

### 3. Merger and relevant merger situation

#### *The transaction*

3.1 Kilfrost told us that in 2013/14 it began to experience cashflow pressures, arising primarily as a result of two successive mild winters in Europe. During this period, Kilfrost began looking for opportunities to dispose of a significant part of its overall business, or raise alternative finance, in order to stabilise its financial position.<sup>30</sup>

3.2 An initial approach was made to Kilfrost by [REDACTED] in [REDACTED] and the [REDACTED] companies carried on discussions until [REDACTED] with regard to the purchase of the Kilfrost group. A formal offer was made [REDACTED], but no agreement was reached. Further discussions took place in [REDACTED], at which point the Kilfrost board decided to widen its search. In April 2015, it appointed [REDACTED] to manage a formal sale

<sup>30</sup> [Kilfrost initial submission](#), paragraph 2.2.

process to trade buyers. In June, [REDACTED] it engaged [REDACTED] was tasked by Kilfrost with finding potential financial purchasers and investors and [REDACTED].

- 3.3 [REDACTED] received a formal expression of interest from [REDACTED] potential trade buyer(s): Clariant. [REDACTED] received offers from [REDACTED] potential financial purchaser(s): [REDACTED]. Although [REDACTED] carried out informal discussions with the management of Kilfrost in parallel to the formal process, these discussions did not progress further. Having considered the [REDACTED] indicative offers, the Kilfrost board decided [REDACTED] to enter into exclusivity agreements with [REDACTED]. However, following a brief due diligence process, [REDACTED] informed [REDACTED] that any deal with it would need to [REDACTED]. In [REDACTED] 2015, Clariant indicated it planned to make a formal offer of £[REDACTED] million [REDACTED] for Kilfrost's global business, and proposed to take a staggered approach by which the North American, South Korean, Japanese and Chinese operations would be acquired first (Phase 1), with the UK and European business to be acquired later (Phase 2). This approach was proposed because of [REDACTED] and the time that would be incurred in Europe by potential merger control procedures in Austria, Spain and the UK. The Kilfrost board decided to take Clariant's offer forward. The Phase 1 deal was signed and completed on [REDACTED] August 2015 and a non-binding letter of intent to undertake Phase 2 was sent by Clariant to Kilfrost [REDACTED]. Phase 2 was [REDACTED] for Clariant and while Clariant could not be forced to buy Kilfrost's European business, there is no suggestion that it ever considered not to go forward with Phase 2.
- 3.4 [REDACTED] 2015, the Asset Purchase Agreement (APA) was signed on [REDACTED] 2015, and the proposed transaction was announced by Clariant on 20 November 2015.<sup>31</sup> The consideration is £[REDACTED] million.
- 3.5 Under the terms of the APA, Clariant will acquire the assets relating to Kilfrost's European ADF and rail de-/anti-icing fluids businesses consisting of customer and supply contracts, open tenders, business IP [REDACTED], stock, goodwill and a few selected fixed asset items, for the provision of ADF and rail de-/anti-icing fluids products. Kilfrost is also [REDACTED] the Parties will continue to compete in specialty fluids, runway de-icing fluids or multi-purpose ground de-icing products.
- 3.6 As part of the transaction, Clariant and Kilfrost also [REDACTED].<sup>32</sup>
- 3.7 Following completion of the sale of the European assets, the APA provided for the [REDACTED].

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<sup>31</sup> Clariant news story: '[Clariant to acquire Kilfrost's aircraft deicing business in Europe](#)'.

<sup>32</sup> [Clariant initial submission](#), paragraph 11.1.

- 3.8 The transaction does not include the transfer of Kilfrost's [REDACTED], nor the purchase of [REDACTED] or the production plant at Haltwhistle (with the exception of the few selected fixed asset items referred to in paragraph 3.5). Kilfrost's research and development technology facility is also not included.
- 3.9 Completion was expressed to be conditional upon clearance by the Austrian, Spanish and UK competition authorities. The transaction is subject to a longstop date [REDACTED] for completion of the conditions including clearance by the CMA. [REDACTED]. The Transaction was classified as *de minimis* in Austria and was cleared without substantive review, and cleared at Phase 1 in Spain on 28 January 2016.<sup>33</sup>

### ***The rationale for the transaction***

- 3.10 As explained in paragraph 3.1, Kilfrost's financial situation led to it seeking a buyer for its business.
- 3.11 Clariant told us that from its perspective, the acquisition of the Kilfrost ADF business represented an attractive investment because the acquisition would allow its ICS business unit to improve its offering for its customers in Europe. Clariant was paying primarily for [REDACTED].
- 3.12 Clariant told us that it considered that the acquisition of the European assets would lead to a number of benefits and efficiencies through the [REDACTED].
- 3.13 [REDACTED]. Clariant identified synergies amounting to CHF [REDACTED] million (£[REDACTED] million) per year in [REDACTED] as Kilfrost's costs were [REDACTED].
- 3.14 We noted that none of Clariant's internal documents relating to the transaction referred to the rail de-/anti-icing fluids part of the Target Business. We asked Clariant to clarify what its plans for this part of the business were. Clariant told us that, [REDACTED], it would be in a position to produce and supply rail de-/anti-icing fluids [REDACTED].
- 3.15 We have accepted this evidence and therefore focused our investigation on the other elements of the Target business, ie the ADF operations, as reflected in the remainder of this report.<sup>34</sup>

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<sup>33</sup> [Spanish clearance decision](#)

<sup>34</sup> We indicated in our [issues statement](#) that we did not intend to pursue a theory of harm relating to the loss of potential competition in the supply of rail or runway de-icing fluids, unless we received submissions on these matters. No third party has expressed any concern to us.

## ***Jurisdiction***

- 3.16 Under section 36 of the Act and our terms of reference (see Appendix A), one of the questions we are required to decide is whether arrangements are in progress or in contemplation which, if carried into effect, will result in the creation of a relevant merger situation.
- 3.17 Section 23 of the Act provides that a relevant merger situation is created if:
- (a) two or more enterprises have ceased to be distinct within the statutory period for a reference;<sup>35</sup> and
  - (b) the ‘turnover test’ or the ‘share of supply test’ (as specified in that section of the Act) is satisfied, or both are satisfied.

### ***Enterprises ceasing to be distinct***

- 3.18 The Act defines an ‘enterprise’ as ‘the activities, or part of the activities, of a business’. A ‘business’ is defined as including ‘a professional practice and includes any other undertaking which is carried on for gain or reward or which is an undertaking in the course of which goods or services are supplied otherwise than free of charge’.<sup>36</sup> The CMA’s guidance on jurisdiction and procedure (CMA2) explains the concept of ‘enterprise’ and in particular the considerations the CMA has regard to in deciding what constitutes an ‘enterprise’.<sup>37</sup>
- 3.19 Taking the elements of the transaction described in paragraph 3.5 and in particular, having regard to the acquisition of goodwill, customer contracts, confidential formulae and know-how, we are satisfied that the combination of assets transferred enables the business activity, namely the manufacture and supply of ADF, to be carried on by Clariant and therefore that the assets that will be acquired by Clariant constitute an ‘enterprise’ for the purposes of the Act.
- 3.20 The Act provides that two enterprises ‘cease to be distinct’ if they are brought under common ownership or control.<sup>38</sup> The transaction described in paragraph 3.4, when completed, will bring under the common ownership of Clariant enterprises which were previously separate.
- 3.21 The condition set out in paragraph 3.17(a) is therefore satisfied.

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<sup>35</sup> As set out in [section 24](#) of the Act.

<sup>36</sup> [Sections 129\(1\) & 129\(3\)](#) of the Act.

<sup>37</sup> [Mergers: Guidance on the CMA’s jurisdiction and procedure, January 2014 \(CMA2\)](#), paragraph 4.8.

<sup>38</sup> [Section 26](#) of the Act.

### *Share of supply test*

- 3.22 As the turnover test is not met,<sup>39</sup> we considered whether the share of supply was satisfied. This would be the case if the merger created or otherwise increased a share of at least 25% in the supply of goods or services of any description in the UK, or in a substantial part of the UK.<sup>40</sup>
- 3.23 We estimate that Clariant's share of supply of ADF to customers in the UK will increase from [20–30]% to [90–100]% as a result of the transaction.
- 3.24 The condition set out in paragraph 3.17(b) is therefore satisfied.

### *Provisional conclusion on jurisdiction*

- 3.25 For the reasons given in paragraphs 3.21 and 3.24, we are satisfied that a relevant merger situation will be created by the acquisition of the Target Business by Clariant, and that we therefore have jurisdiction to decide whether the creation of that situation may be expected to result in an SLC within any market or markets in the UK for goods or services.

## **4. Market definition**

- 4.1 The purpose of market definition is to provide a framework for the analysis of the competitive effects of the merger. The relevant market contains the most significant competitive alternatives available to the customers of the merger firms and includes the sources of competition to the merger firms that are immediate determinants of the effects of the merger. Market definition is a useful tool, but not an end in itself, and an assessment of whether a merger may give rise to an SLC may take into account constraints outside the relevant market, segmentation within the relevant market, or other ways in which some constraints are more important than others.<sup>41</sup>
- 4.2 Clariant told us that whilst the different types of ADF consisted of partly different chemical components; had partly different thickening agents; were of slightly different viscosities; and had slightly different properties and applications, it did not consider that they each constituted a separate product market.<sup>42</sup> This was mainly because:

- (a) From a demand-side perspective, a customer would often buy Type I together with either Type II or IV, ie it would use Type I for de-icing the

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<sup>39</sup> Sales of ADF by Kilfrost in the UK are well below the required threshold of £70 million.

<sup>40</sup> [Section 23\(2\)\(b\)](#) of the Act.

<sup>41</sup> [Merger Assessment Guidelines](#), paragraphs 5.2.1 & 5.2.2.

<sup>42</sup> [Clariant initial submission](#), paragraph 4.5.

aircraft and then Type II or IV for anti-icing directly after. Types I and II/IV were commonly but not exclusively purchased together and some customers held a supply of Type I and either Type II or Type IV in order to deploy the correct type of fluid as conditions dictate. However some customers might only purchase one type, particularly if their storage facilities were limited. Type II and Type IV fluids were also largely comparable in price, although the supply price of Type I was generally higher due to the fact that it contained a higher proportion of MPG.

(b) From a supply-side perspective, suppliers of ADF were flexible and were able to adjust their production to supply a customer with any of Types I, II and IV as required. It was relatively easy for a supplier to switch production of the various types of ADF. All types had a similar base, consisting of MPG, water and various additives. Type I required a simple blending of the various ingredients. For Types II and IV, the blending process was similar but was more complex as it required more quality control/testing during the process and different thickening agents were used.

4.3 However Clariant told us that it was not necessary for a supplier of ADF to be able to provide all three types of ADF to be considered credible. While customers commonly purchased all three types of fluid from the same suppliers, mostly for reasons of efficiency and convenience, there was no technical reason for customers to do so or obstacle to them purchasing these separately.

4.4 With regard to geographic market definition, Clariant told us that for the purpose of our assessment this was not meaningful and could be left open. This was because the market was principally characterised as a tender market, and suppliers could act as credible bidders for contracts in the UK irrespective of their location. As such, the location of suppliers was not relevant in determining the strength of constraint they might pose.

4.5 Kilfrost did not express a view on the relevant product market. It stated however that the geographic scope of the supply of ADF was at least EEA wide. This was because from the demand side, customers purchased on a pan-European basis. In addition, customers (airports, airlines and ground handling agents) tended to request quotations from suppliers across Europe to give them the maximum possible choice of supplier and in order to obtain

the lowest possible price and utmost security of supply. There were many examples of customers switching between the various European suppliers.<sup>43</sup>

4.6 In line with normal practice, we examine two dimensions of market definition in this section:

(a) the product dimension (paragraphs 4.7 to 4.34); and

(b) the geographic dimension (paragraphs 4.35 to 4.52).

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

4.7 The relevant product market is identified primarily by considering the degree of demand-side and, to a lesser degree, supply-side substitution. It is usual to define markets using the hypothetical monopolist test. This test delineates a market as a set of substitute products over which a hypothetical monopolist would find it profitable to impose a small but significant non-transitory increase in prices (SSNIP). The test is described in detail in paragraphs 5.2.10 to 5.2.20 of the CMA Merger Assessment Guidelines.<sup>44</sup>

4.8 We applied the hypothetical monopolist test framework by starting with a narrow set of relatively homogeneous products, and considered whether there was likely to be demand-side and/or supply-side substitution if prices were to rise for these products. A strict quantitative application of a SSNIP test is difficult in this case, where prices are individually negotiated and are influenced by product and geographical differentiation. We therefore focused on a qualitative assessment of demand- and supply-side substitutability of the products supplied by the Parties, which includes a consideration of different end-uses of products.

4.9 Clariant and Kilfrost both supply three types of ADF to UK customers: Type I, Type II and Type IV. Kilfrost supplies them both as pre-mixed products and as concentrates requiring dilution on customer sites, while Clariant only supplies them as concentrates.

### ***Substitutability between different types of fluids***

4.10 As discussed in Appendix C, the different types of ADF have different physical characteristics and generally fulfil different functions although there is some flexibility in the way in which they can be used (eg at certain temperatures Type II and Type IV have similar holdover times). Within a given type,

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<sup>43</sup> [Kilfrost initial submission](#), paragraph 3.8.

<sup>44</sup> [Merger Assessment Guidelines](#), paragraphs 5.2.10–5.2.20.

products supplied by various manufacturers can be regarded as functionally substitutable as they are certified and generally regarded as equivalent once certified.

4.11 We asked customers about their ability to switch between types of ADF. Their responses are grouped below, based on the types of ADF they currently purchase, starting with customers buying two types of products:

(a) Type I and Type IV fluids ([REDACTED]). Customers all told us that they did not consider the two products they bought to be interchangeable, as they were used for different purposes, and as such were complementary. [One customer] told us that from an operational point of view they were only really interchangeable in certain weather and in case of emergencies. It added that price was not a relevant consideration in the choice of which to use.

(b) Type I and Type II ADF ([REDACTED]). Customers also did not consider the different types of ADF to be substitutable. In particular, [REDACTED] told us that the interchangeability between ADF types was restricted. To purchase a different type of ADF to fulfil the same purpose was not straightforward because storage and vehicles would have to be emptied and cleaned out at a huge cost. The fluid type was also largely driven by the airlines it contracted with insofar as they usually had a preference for the type of fluid used to spray on their aircraft.

4.12 One company [REDACTED], told us that it had done so for operational rather than commercial reasons. It considered that it was safer and resulted in higher customer satisfaction.

4.13 A number of the customers from whom we received evidence buy only Type II ADF to carry out single stage spraying: [REDACTED]. Their evidence indicates that switching to other types of ADF would involve significant changes to their operation. In particular:

(a) [REDACTED] told us that it only carries out single stage spraying, which involves applying heated 75% Type II mix on the aircraft surface, thus both de-icing it and preventing the build of new ice. It told us that it did not consider switching to a two-stage process involving two types of fluid (Type I and Type II or IV). It also told us that this approach tends to be taken by specialist aircraft de-icing services companies. Those companies apply anti-icing fluid preventatively early in the morning (12.00am or 1.00am), and by doing so minimise the amount of de-icing fluid that is required before departure.

(b) [REDACTED] told us that it uses a single type of fluid but in two forms, one which is pre-mixed with water and the other which is neat, and it would not use two different types of fluid in its operation. As it is set up to use Type II fluid, it could not change ADF type without a significant amount of work on its side. This would include ensuring all its existing stock was used prior to the 'new' ADF type being delivered, ensuring its de-icing equipment was capable of dispensing this ADF, having its manuals and processes updated and informing customer airlines of the new type of fluid to be used. This would not be something it would undertake in normal circumstances and it has never done it in the past.

4.14 The evidence shows that the three types of ADF products are largely complementary and that customers would not switch between them in response to a small but significant non-transitory price rise.

#### *Purchases from one or more suppliers*

4.15 Customers varied in their views as to whether different types of ADF could be bought from different suppliers. Some expressed a strong preference for purchasing from a single supplier for operational and commercial reasons or informed us that this was their usual practice [REDACTED] but others did or would consider buying from different suppliers [REDACTED].

4.16 With regard to practices adopted in continental Europe, [REDACTED] told us that generally customers bought all their ADF products from the same supplier to minimise the risk of human error and obtain better pricing. [REDACTED] also told us that since ADF from different suppliers could not be used together, dual sourcing constrains the movement of ADF between airports in the event of a shortage. One exception to this preference for single sourcing was [a major airport] which had bought Type I from one supplier and Type II and IV from another in the past.

4.17 Clariant told us that dual-sourcing was very unusual in Europe although [a major airport] was one such dual-sourcing customer.

4.18 Kilfrost told us that most ADF customers used a single supplier, but that large customers such as [REDACTED] may seek a second as a backup.

4.19 ADDCON told us that UK customers did not buy from it because it was only able to supply Type I. It added that this was the situation at [an airport in Europe], but that at [another airport in Europe], the airport splits its purchases and therefore provides ADDCON with a market opportunity. ADDCON thought that the reason for wanting a multi-type vendor might be that this simplified a customer's operations.

- 4.20 LNT Solutions told us that customers could split supply between two suppliers but generally if one supplied Type I, it also supplied Type II or Type IV.<sup>45</sup>
- 4.21 The evidence indicates that although there are some notable exceptions, customers, both in the UK and Europe, tend to buy all the types of ADF they require from the same supplier. This is both for operational and commercial reasons.

#### *Substitutability between pre-mixed fluids and concentrates*

- 4.22 Kilfrost provided us with a list of [REDACTED] customers who purchase pre-mixed ADF at least for certain locations. The locations identified by Kilfrost include [REDACTED].
- 4.23 Some customers that bought pre-mixed ADF told us that they were able to dilute ADF on site due to the de-icer rigs capability ([REDACTED]) and some told us that although they bought pre-mixed ADF, they could switch to undiluted products if needed ([REDACTED]).
- 4.24 However the vast majority of the customers we talked to who bought pre-mixed ADF, did so because they could not use concentrated ADF for operational reasons. They would need to make substantial investments and/or changes to their processes to be able to switch to the use of concentrates ([REDACTED]). For example, [REDACTED] told us that where it used a pre-mixed fluid it was because it was essential, as mixing 'hard' water could degrade ADF, and therefore [REDACTED] local water could not be used. In a number of airports [REDACTED] uses the local water supply to prepare the finished product, rather than pre-mixed, where it is the appropriate type of water. If the pre-mixed fluid were not supplied, the only alternative would be to have distilled water and storage tanks for this [REDACTED], which would be more expensive. [REDACTED] also noted that when bought as a finished product, the fluid was available for immediate use without having to wait for the fluids to mix up in de-icing trucks to achieve the correct refractive index. With concentrate it took around 20 to 30 minutes to mix fluids in rigs and this extra time could lead to unacceptable delays with de-icing, resulting in aircraft missing slots and a backlog of aircraft building up. [REDACTED] told us that at the airports where it mixed the fluids itself, this had required investing in equipment to 'balance and control' the water. [REDACTED] told us that it did not have the capability to mix fluids at some of its stations, and the price (and operational impact) of setting up the infrastructure would make that unviable.

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<sup>45</sup> [LNT Solutions hearing summary](#).

- 4.25 The responses from customers show that at some locations and for some customers, switching from buying pre-mixed to buying concentrates would be at best expensive and in some cases may be operationally problematic. However for some other customers, buying pre-mixed fluids appears to be a matter of habit or convenience. There may therefore be a degree of demand-side substitutability between pre-mixed and concentrated ADF for some, but not all, customers.

### *Supply-side substitutability*

#### *Various types of ADF*

- 4.26 As explained in Appendix E, the time and cost involved in developing product formulae and the process and cost of obtaining the necessary certification to produce the different types of ADF are substantial.
- 4.27 However, once a producer has the necessary certifications, it is able to switch production capacity between different products easily: [REDACTED] told us that cleaning and reconfiguring the equipment to move from one type of ADF to another would take [REDACTED], the proportion of tanks allocated to each type was adjusted at the beginning of the season to reflect [REDACTED] required to fulfil the contracts won ahead of the season. [REDACTED] told us that it would typically use dedicated tanks for each type of ADF to avoid having to clean tanks out frequently. Blending vessels could potentially be used for simple blends during the summer. [REDACTED] added, however, that an ADF supplier could in principle switch the ADF type under production in a tank with ease.
- 4.28 Two ADF suppliers (LNT Solutions and ADDCON) currently supply only Type I ADF but are in the process of obtaining certifications for Types II and IV ADF. The other suppliers with sales in the EEA (the Parties, ABAX, and Proviron) are able to offer the three relevant types of ADF to customers.

#### *Pre-mixed and concentrates*

- 4.29 We considered whether suppliers that supply ADF concentrate could switch to supplying pre-mixed ADF. In principle, given that this only requires the addition of water, an activity that is routinely undertaken by ADF customers before they apply the product, suppliers should be able to switch from producing one to producing the other.<sup>46</sup>

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<sup>46</sup> [Airline Services hearing summary](#), paragraph 13.

### *Provisional conclusion on product market definition*

- 4.30 As ADF fluids are proprietary and the use of the fluids is heavily regulated, customers cannot purchase the same ADF type from two different suppliers without incurring significant additional costs (eg separate tanks) and potential risks (eg two types being mixed accidentally). The evidence provided by customers shows that they all consider that the three types of ADF are not substitutable because they perform different functions and switching between types involves significant costs and operational difficulties, particularly if the application process itself needs to be modified (eg where it would involve switching from a one-stage to a two-stage de-icing process).
- 4.31 Many customers in the UK buy all their ADF types from the same supplier (ie Kilfrost) and some would not switch to dual supply ([X]). However some ([X]) have split their purchases between two suppliers, buying one type from one and the other type from the other. Some customers told us that although they currently bought from the same supplier, in principle they could buy each type of ADF from a different supplier. Suppliers however consistently told us that most customers (in the UK and EEA) would buy all the ADF types from one supplier and some told us that only suppliers that were able to offer Types I, II and IV were regarded as credible by customers.
- 4.32 From a supply-side perspective, there are few technical barriers to switching between types, once a supplier has developed suitable formulae and obtained certifications.<sup>47</sup>
- 4.33 The evidence we have received from customers indicates that at least some of those customers who buy pre-mixed fluids are constrained in their ability to switch to concentrated fluids by the set-up costs associated with doing so, but it may be that others simply buy pre-mixed fluids because they are available and would be prepared to switch to concentrate if faced by a price rise. In principle we see no reason why a manufacturer of concentrates could not also supply pre-mixed products. The cost of doing so would be unlikely to be high, as this is simply a matter of adding more water to the product and shipping it in different containers.
- 4.34 We provisionally conclude that the relevant product market comprises all types of ADF that are certified for use in the EEA. We recognise that two suppliers (ADDCON, LNT Solutions) currently supply only ADF Type I, but we

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<sup>47</sup> As explained in Appendix E, developing such formulae and obtaining certifications is a costly and time consuming process.

note that both are in the process of obtaining certifications for Types II and IV. We explore the implications of this in Section 6 below.

### ***Geographic market definition<sup>48</sup>***

- 4.35 The geographic market is also defined using the framework of the hypothetical monopolist test.
- 4.36 We have considered three factors in defining the geographic scope of the ADF market:
- (a) the characteristics of ADF products, including the types of products that can be used in different geographies;
  - (b) customer requirements; and
  - (c) supply-side considerations.

### ***Properties of ADF and regulatory requirements***

- 4.37 MPG based ADF is a non-corrosive and non-perishable liquid, which has a very low toxicity, and can be transported over long distances in bulk or in containers.
- 4.38 Evidence received on the properties of ADF from suppliers in the EEA and standards stipulated in the relevant guidelines has shown that outside the EEA different specifications of ADF may be required. For instance, in Canada and Russia, MEG-based ADF may be required as it performs better in lower temperatures whereas in the EEA MPG-based ADF is required for environmental reasons.
- 4.39 The Type I MPG-based ADF sold in Scandinavia can be different to products sold in the rest of Europe due to differences in environmental laws. We understand that this can require minor modifications to the formulation of the ADF. This appears to be a unique feature of Type I MPG-based ADF products sold in Scandinavia and does not necessarily apply to other types of ADF.

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<sup>48</sup> We received evidence from some suppliers (Esseco, Proviron) and some customers ([REDACTED]) that transporting pre-mixed fluid to the UK is not economically viable. However, our provisional view is that there is one product market for all ADF and to the extent that certain customers are unable to switch from pre-mixed fluids to concentrates, we consider that a supplier of concentrate could easily set up a mixing facility close to customers' facilities. We therefore do not consider the issue of market definition for pre-mixed fluids separately.

### *Customer requirements*

- 4.40 Customers' demand for ADF is weather dependent and customers require timely deliveries when the product is needed. Customers therefore value proximity of suppliers which in turn determines the set of credible suppliers from which customers will want to buy ADF.
- 4.41 The product that customers contract for is an option to buy ADF of different types on specified terms for delivery at a certain time and at a given place. They typically negotiate these contracts annually well ahead of the winter season when the product is needed. The contracts describe a complex bundle of characteristics that comprise, among other things, the notice that needs to be given for their delivery (eg [✂]) and the place of delivery (eg London Heathrow Airport).
- 4.42 Potential suppliers must demonstrate that they are able to supply all aspects of this complex bundle. We consider that some of the aspects of the bundle (for example a [✂] delivery time and [✂] delivery time) might be substitutable, with this aspect of quality being traded-off for price. The extent to which such trade-offs are possible depends, among other things, on the storage capacity available to customers and their appetite for taking logistics risks. For example, we have been told that Milan Malpensa Airport has enough storage to last a whole season, as does Paris Charles de Gaulle. Therefore, for these airports, different delivery terms may be substitutable and the price of two offers with different delivery terms cannot differ by very much (all other things unchanged). Conversely, for a customer that has little storage capacity and little appetite for carrying ADF stock or managing its complex logistics, the substitutability between offers with different delivery terms may be much more limited.
- 4.43 However, we consider that the place of delivery of the bundle is not substitutable with other places of delivery. For example, delivery at London Gatwick is not a substitute in any plausible respect for delivery at London Heathrow.

### *Supply-side considerations*

- 4.44 We have found evidence that from a supply-side perspective, a solid commitment to a local geography is necessary to be a credible supplier of ADF:
- (a) The reputation of suppliers may be 'local' – customers may be concerned that providers would not be able to supply them reliably even though they

have established operations in other areas. For instance, [REDACTED] appears to have [REDACTED].

- (b) Clariant's own strategy is to [REDACTED] i.e. Central Europe (Gendorf), Scandinavia (Uddevalla), Finland (Rauma) and Russia (Moscow). Clariant also [REDACTED].
- (c) Similarly, Kilfrost serves the UK, not only from its manufacturing plant in Haltwhistle, but also from [REDACTED]. Kilfrost also has a substantial presence in continental Europe, [REDACTED].
- (d) Local sales force – we have learned that established ADF suppliers typically have local representatives in the UK to monitor opportunities, contact prospective customers, present the offering, and take part in competitions.

4.45 However, we have also found several indicators that the relevant geographic market is wider than the UK market from a supply-side perspective: ADF manufacturers in the EEA submitted information about their manufacturing and blending facilities and the geographies they were able to serve from those facilities. Suppliers located in the EEA were prepared to serve any customer in Europe, provided they could meet their service requirements, even if they were located far from their production facilities. For instance, Clariant supplies customers in Spain,<sup>49</sup> Kilfrost supplies customers in Austria, and Proviron supplies customers in Iceland. We note that Clariant has plans to serve the UK from [REDACTED]. Kilfrost supplies products from its European facilities (including from the UK) to countries outside of the EEA.<sup>50</sup>

4.46 Similarly, we have heard of instances in which the raw material, MPG, was transported over even greater distances (eg Kilfrost imported from [REDACTED]) and that concentrate or additives are transported between continents (eg Kilfrost transports additives to blending facilities in [REDACTED]; Clariant transports concentrate from its production facility in [REDACTED] to its blending facility in [REDACTED]). Therefore, there appears to be no technical or logistical limit to the distance ADF can be transported, although the commercial viability of supply will be affected by transport costs and the ability to meet customers' security of supply requirements.

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<sup>49</sup> [Spanish clearance decision](#), pp2 & 3.

<sup>50</sup> Kilfrost told us that there was no maximum distance beyond which it was not profitable to supply and that it had, for example, shipped products from the UK to [REDACTED], even though it took a considerable amount of time for the product to reach customers there. This was because customers tended to be small airports that could stock sufficient amounts of products.

- 4.47 Suppliers told us that they could, and did, relatively easily set up storage capacities near the customer or at the customer location from which they then would supply that customer. Accordingly, a supplier whose manufacturing or blending facilities were too far away from a customer requiring a certain delivery time, would usually store ADF at the customer's location or within a reasonable distance that allowed it to deliver within the customer's required delivery time.
- 4.48 The distance over which ADF can be profitably transported is limited by transport costs. This depends on a number of factors (including, in particular, the mode of transport and the retail price of ADF) and there is no clear distance threshold for determining the area that can be served from a production facility. As a rough guide, we estimate that the maximum distance a 23,000-litre ISO container can profitably travel ([REDACTED]) is in the range of [2,000–3,000] kilometres ([1,000–2,000] miles). This corresponds to approximately [25–35] hours constant drive time. It is likely that bulk transport, in particular by sea or rail, allows for greater distances.
- 4.49 Given that we have not received any evidence that there is a shortage of storage and haulage facilities anywhere in the EEA, we consider that in principle any supplier in the EEA would be in a position to obtain access to storage and haulage facilities to serve a customer in the UK.
- 4.50 Issues regarding transport costs and delivery times are likely to be particularly pronounced for manufacturers based outside the EEA: [REDACTED] told us that it did not ship ADF from the USA, where it manufactured ADF itself, due to the high transportation costs. None of the customers and suppliers we have talked to about competition in the supply of ADF has indicated that competitive constraints are posed from outside the EEA. Clariant's internal records confirm this position.

*Provisional conclusion on geographic market definition*

- 4.51 In light of the above, we provisionally conclude that there are no clear boundaries to the geographic market, but that it is unlikely to be wider than the EEA.<sup>51</sup> There are however local aspects of competition resulting from a combination of each customer's specific requirements and each supplier's ability to meet those requirements, some of which relate to that supplier's geographic footprint (in the UK and/or EEA). This indicates that the geographic market may be narrower than the EEA. We therefore provisionally

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<sup>51</sup> Given that Switzerland is located in the middle of the EEA in geographic terms, we include it in the EEA for the purposes of our analysis.

conclude that the effects of the Merger should be analysed both on an EEA-wide basis and on a narrower UK-wide basis.

- 4.52 Because of the small number of suppliers of ADF in the EEA we have assessed the constraints on the Parties in relation to the supply of ADF to UK customers from each of these suppliers in our competitive assessment. This assessment takes account of the location of the facilities of these suppliers (and their partners, eg third party blending facilities and storage depots), their reputation and their ability to meet customers' requirements for short lead times, and guarantees relating to security of supply.

### ***Provisional conclusion on market definition***

- 4.53 We therefore provisionally conclude that the relevant market in which to assess the competitive effects of the Merger is the market for ADF products in the EEA, recognising that there are local variations in the competitive constraints faced by the Parties in different parts of the EEA, which are taken into account within the assessment of the competitive effects of the Merger, as they relate to UK customers.

## **5. Counterfactual**

- 5.1 Before we turn to the competitive effects of a merger, we need to assess what we expect would have been the competitive situation in the absence of that merger. This is called the 'counterfactual'.<sup>52</sup> It provides a benchmark against which the expected effects of the merger can be assessed. The CMA may examine several possible scenarios, one of which may be the continuation of the pre-merger situation; but ultimately only the most likely scenario will be selected as the counterfactual.<sup>53</sup> The CMA will typically incorporate into the counterfactual only those aspects of scenarios that appear likely on the basis of the facts available to it and the extent of its ability to foresee future developments.<sup>54</sup>
- 5.2 Clariant told us that in the absence of the Merger, it would continue to focus on winning customer contracts in the UK. With regard to Kilfrost, Clariant considered that [redacted].<sup>55</sup>

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<sup>52</sup> [Merger Assessment Guidelines](#), paragraph 4.3.1.

<sup>53</sup> [Merger Assessment Guidelines](#), paragraph 4.3.6.

<sup>54</sup> [Merger Assessment Guidelines](#), paragraph 4.3.6.

<sup>55</sup> [Clariant initial submission](#), paragraphs 10.1–10.3.

- 5.3 Kilfrost originally told us that in the absence of the deal it had agreed with Clariant [REDACTED],<sup>56</sup> but later in our inquiry, it revised its position and [REDACTED]. It added that [REDACTED].<sup>57</sup>
- 5.4 As explained in paragraph 3.3, the sale of the Kilfrost business was split into two phases, the first one having completed on [REDACTED] August 2015 and the second one having been entered into as an option, which was exercised by Clariant on [REDACTED] 2015. However the evidence we obtained showed that:
- (a) The sale of the Kilfrost business was conceived and introduced to potential bidders as a single transaction. Kilfrost's instructions to [REDACTED] were to find a buyer for the entire business.
  - (b) Bidders who expressed an interest (other than Clariant) did so on the basis of acquiring Kilfrost in its entirety.
  - (c) The global sale to Clariant was to be completed in two phases due to [REDACTED] and merger control timetables. Consideration was agreed for the sale of the entire business and reflected [REDACTED].
  - (d) The structuring of the second phase [REDACTED] was intended to satisfy [REDACTED] and [REDACTED].[REDACTED]. It is conceivable that Clariant could have decided not to [REDACTED], but given the facts of this case we do not consider this to be a probable outcome.
- 5.5 In the light of this evidence, we have concluded that an appropriate approach to the counterfactual was to assess what would have happened, in the absence of both phases of the transaction (referred to in the remainder of Section 5 as the Transaction) and examined three possible scenarios:
- (a) Scenario 1: whether Kilfrost would have continued to operate independently (paragraphs 5.7 to 5.8).
  - (b) Scenario 2: whether Kilfrost would have been acquired (either in whole or in part) by an alternative purchaser (paragraphs 5.9 to 5.11).
  - (c) Scenario 3: whether Kilfrost would have exited the market (paragraphs 5.12 to 5.15).
- 5.6 We set out the evidence and analysis for each scenario in turn before concluding on the likely counterfactual.

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<sup>56</sup> Kilfrost initial submission, paragraph 7.

<sup>57</sup> Kilfrost initial submission, paragraph 7.

### **Scenario 1**

- 5.7 Kilfrost's management accounts, the minutes of its board meetings and evidence given to us by [REDACTED] show that as of June 2015, the company's financial position was [REDACTED] and [REDACTED]. Kilfrost told us [REDACTED].
- 5.8 We therefore provisionally concluded that it was unlikely that absent the Transaction, Kilfrost would [REDACTED].

### **Scenario 2**

- 5.9 We obtained evidence from [REDACTED] and [REDACTED] on the processes they carried out to identify potential acquirers of Kilfrost. This is summarised in paragraphs 3.2 and 3.3. As a result of this process, in addition to Clariant, there were [REDACTED] alternative financial buyer(s) ([REDACTED]) and [REDACTED] trade buyer(s) ([REDACTED]). Kilfrost told us that, had it not entered into an agreement with Clariant, the most likely outcome would have been the sale of the business to [REDACTED]. We however noted that [REDACTED] had previously shown interest in the business but had not put in a formal offer and that it had not undertaken due diligence.
- 5.10 Kilfrost entered into an exclusivity agreement with [REDACTED] as a potential financial buyer (as well as with Clariant as a potential trade buyer) [REDACTED], but following limited due diligence, [REDACTED] stated that [REDACTED], an option which was not attractive to the board of Kilfrost. [REDACTED] told us that, [REDACTED].
- 5.11 We therefore considered that given the level of engagement and the stage of negotiations with the potential alternative purchasers, the sale of Kilfrost to either a trade or a financial buyer was a likely outcome in the absence of the agreement with Clariant. While there appears to have been a preference to sell to a trade buyer rather than to a financial investor, both alternative routes were open to Kilfrost. For the purposes of the counterfactual, we do not consider that we need to determine which of the two options would have been most likely as, on the basis of the information we have, all potential acquirers at that time would have been likely to continue to compete in the supply of ADF within Europe including the UK.

### **Scenario 3**

- 5.12 In the light of the options set out under scenario 2, and in particular given the value identified in at least the UK and European parts of Kilfrost's business as reflected in possible alternative purchasers' evidence to us, together with the uncertainty in financial outcome that would arise from an insolvency process, the likelihood of Kilfrost being forced to liquidate and exit the market entirely appears low.

- 5.13 From the outset of the sale process, trade and financial buyers as noted above were interested in the Kilfrost business. [REDACTED].
- 5.14 The fact that liquidation was unlikely is also reflected in internal [REDACTED] documents which considered contingency plans for the Kilfrost business. The plans, [REDACTED]. However these plans would only be exercised in the event that [REDACTED] and neither did [REDACTED]. The two sale options were considered to ‘deliver a more certain outcome than the contingency plans, and as such would be pursued before this contingency is put in place.’
- 5.15 [REDACTED] told us that as part of its work it had prepared [REDACTED] (produced at a high level) [REDACTED]. According to [REDACTED], it was ‘very difficult’ and a matter of judgement to accurately estimate the precise outcome, but settled on a range of outcomes [REDACTED] that illustrate the fundamental uncertainty [REDACTED]. [REDACTED] did not compare the [REDACTED] offer to the [REDACTED] as by this stage in the sale process Clariant had been chosen as the preferred option.

### ***Provisional conclusions on the counterfactual***

- 5.16 Taking account of the evidence set out in paragraphs 5.2 to 5.15, in our view it is likely that, absent the Transaction, Kilfrost would have sought a sale for its entire business. The evidence we have seen indicates that Kilfrost’s ADF business was viable in Europe, including the UK. Therefore, it was likely that an alternative purchaser would have been willing to acquire the business. Indeed, a number of alternative purchasers did express an interest and made offers for the business. We have therefore provisionally concluded that the most likely counterfactual would have been the sale of Kilfrost, in whole or in part, to an alternative purchaser.
- 5.17 It is not necessary to determine whether such an acquisition would have occurred [REDACTED] (eg to [REDACTED]) or through a trade sale (eg to [REDACTED]) as, on the basis of the information we have received, an alternative acquirer would have continued to supply ADF within Europe including the UK.
- 5.18 We therefore analysed the competitive effects of the Merger against the pre-merger conditions of competition.<sup>58</sup>

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<sup>58</sup> Clariant told us that it was not accurate to see the two acquisitions as a single transaction and that if the European transaction (Phase 2) did not complete then the non-European transaction (Phase 1) would remain in place. We do not agree with the view that the two transactions are entirely unrelated, but even if we did, given the current financial position of Kilfrost following the competition of Phase 1, we consider that the conditions of competition under that counterfactual would be materially similar to those under our adopted counterfactual.

## **6. Assessment of the competitive effects of the merger**

- 6.1 Given our provisional conclusions on geographic market definition (paragraphs 4.51 and 4.52), our assessment relies not only on evidence we obtained from UK customers and ADF suppliers, including the Parties, but also evidence from customers and suppliers in the EEA where relevant to our understanding of the ability of the various ADF suppliers to compete in the UK.

### ***Nature of pre-merger competition***

- 6.2 We set out below the evidence we have received on the requirements that customers have in relation to ADF, the nature of contractual arrangements, competitive processes and issues relating to the process of switching, including switching costs.

### ***Customer requirements***

- 6.3 The vast majority of customers that we contacted told us that product quality, security of supply, and price were the key elements that they considered when they compared potential suppliers.
- 6.4 [X] emphasised that a credible supplier needed to combine a good product and a reliable logistics chain. Another customer ([X]) said that a new unknown supplier of ADF would need a ‘very compelling’ case before being considered as credible. This meant ‘millions of litres of stock; a very solid supply chain; being competitive on price; and offering Type I fluid and Type IV fluid, both in mixed and concentrated form’.

### ***Product***

- 6.5 All customers that we spoke to considered that suppliers needed to have a certified and approved ADF product in order to be viewed as credible. That is, as a minimum requirement, an ADF product needs to meet SAE International’s standards, and comply with local legislation or guidelines. Some customers have stricter requirements and, having developed in-house expertise, perform their own tests on certified ADF products and use these as the basis for deciding which products they consider to be suitable for their operation.

### ***Security of supply***

- 6.6 The evidence we received from customers indicates that ADF is essential for their business in winter conditions. We note that the cost of a de-icing

procedure for an aeroplane is relatively small compared to the costs that airlines incur when flights are delayed or cancelled.<sup>59</sup> For example, [REDACTED] told us that delays and cancellation of flights led to significant direct costs (eg in the form of compensation for passengers, including board and lodging),<sup>60</sup> indirect costs through the repercussions of delays and cancellations on the airline's entire network, and reputational damage. Clariant also told us that failure to supply would be extremely serious because stopping operations at a particular airport also had a knock-on effect on all the other airports to or from which flights depart.

6.7 Given its critical role in their operations, customers attach significant weight to the ability of suppliers to deliver ADF on time in difficult weather conditions:

- (a) Kilfrost told us that all customers negotiated on price, but that what really mattered to them was security of supply, especially if a customer had been let down in the past or it was aware of another customer having been let down in a severe winter.
- (b) Clariant told us that operations managers would mostly be concerned about ease of supply and guaranteed delivery (while purchasing managers focused on price).
- (c) Most of the customers we spoke with referred to the supply issues that occurred in the winter of 2010/11 and some told us that they took this as a benchmark for the performance of ADF suppliers.

6.8 From the discussions we had with customers about their requirement for guaranteed security of supply, we understand that this involves two key elements:

- (a) First, as part of an ADF supply arrangement customers agree with a supplier the timing and trading terms of deliveries (in particular the time from the order until delivery and sometimes the ADF stock to be held by the supplier). Clariant told us that customers in the EEA commonly had delivery time requirements of [REDACTED], [REDACTED], or [REDACTED] hours, sometimes up to [REDACTED] hours. Kilfrost mentioned that it delivered within [REDACTED] to [REDACTED] hours within the UK. ABAX also told us that most of the time delivery time requirements were [REDACTED] hours. The Parties also told us that some customers may have more flexibility than others because they had smaller

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<sup>59</sup> For example, Clariant told us that one procedure for an Airbus A320 may require around 200 to 300 litres for de-icing and over 1,000 litres for anti-icing under heavy snow. This is equivalent to a cost of ADF of around £200 to £1,000 per procedure (assuming a price of £1 per litre). The statutory compensations for passengers are up to €600 (£472) per passenger. We therefore consider that the cost for an airline of delays and compensation alone are multiples of the cost of a de- and anti-icing procedure.

<sup>60</sup> See for instance, the compensation for passengers stipulated in Regulation (EC) No 261/2004.

operations (so only small quantities of ADF were required and these could be stored more readily at the airport) or because they had their own storage facilities. This was echoed by ABAX, which told us that with smaller customers, service requirements could be more flexible and they could accept [redacted] to [redacted]-hour lead times.

(b) Second, we understand that customers also take into account the risk of severe winter conditions and the likelihood of supply disruptions in such conditions. For example, one customer, [redacted] told us that a supplier from continental Europe would need to keep stock levels equivalent to the worst-case scenario in the UK in order for it to be considered a credible supplier. A lack of confidence that an ADF supplier could deliver adequate supplies in severe conditions can therefore mean that customers do not perceive that supplier as credible even if it can show that it would be able to deliver within an acceptable timescale for more routine orders.

6.9 It is commonly up to the supplier to set up and organise a logistics solution, usually with the involvement of third-party providers, to fulfil the supply agreement. A supplier may use any combination of transport solutions, additional storage, or local production to achieve what is required by the customer. In selecting a supplier, customers have the choice either to turn to a supplier that they know to be reliable or, if the supplier is unproven, rely on the information provided by this supplier on the resilience of its untested logistics solution to cope in difficult weather conditions.

#### *Price*

6.10 [redacted] told us that once it had established that suppliers had a reliable logistics chain, its choice of supplier came down to price.

6.11 We have seen examples where customers have traded price off against other elements, for instance [redacted] had discussions with suppliers around price and holdover times. However, one customer told us that such negotiations only occurred once it had considered the ADF product as qualified and the other elements of the suppliers' offerings as credible.

6.12 We were also told that, for customers that are prepared to buy Type I ADF only, competition for that product may be more price-driven, because of the entry of two new suppliers (ADDCON and LNT Solutions) in the EEA. For instance, some customers in Germany had bought ADF Type I from suppliers that did not manufacture Type II or IV and we have seen evidence, [redacted], that when this was the case, aggressive price competition was a prominent aspect of the competitive process. However, the evidence we have received also shows that these customers are typically small airports and that some of them

are relatively close to the manufacturing sites of the suppliers. We have also received evidence that customers in the UK are not generally prepared to buy from suppliers that only manufacture ADF Type I and the majority of customers we spoke with told us that they would not consider buying different types of ADF from different suppliers.<sup>61</sup>

### *Contractual arrangements*

- 6.13 We have received information about common contractual arrangements with ADF suppliers. The main features of these agreements are set out below.
- 6.14 ADF supply contracts in the UK are typically annual but in some cases may be for two to three winter seasons. These contracts stipulate the type of ADF to be supplied (and at what dilution level if a pre-mixed product is required), as well as the exact physical and chemical properties of these products. The contracts also commonly state a unit price (for each type of ADF and each diluted ADF type) to be paid in the first season. Multi-season contracts are then either at a fixed price for following seasons or contain a variable price clause where the price is commonly linked to an index representing the cost of MPG.<sup>62</sup>
- 6.15 Contracts then specify where and in which format (bulk, container, IBC) the ADF product will be delivered and within what time frame after receiving an order. In some cases, contracts also contain clauses on the level and location of stock to be maintained by the supplier,<sup>63</sup> and penalty clauses in case of delays or non-availability of the products. [REDACTED] told us that its ADF supply contracts contained penalty clauses for failure to supply and that these could be onerous. [REDACTED] told us that the amount of the penalty varied from 1% to 20% of the product price per day, and the cap to that penalty varied from 15% to 100% of the product price, although there were circumstances in which a supplier may declare a force majeure event. The only contractual commitment relating to the management of stocks by customers that we have seen in contracts was a best endeavours obligation to hold 'sufficient quantities' at the airport [REDACTED] by the customer [REDACTED] in case of delayed delivery [REDACTED] due to force majeure.
- 6.16 Volumes are often not specified as demand will vary depending on the weather and customers do not have to commit to buying a minimum quantity (other than that determined by the size of the container in which it is

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<sup>61</sup> As noted in paragraphs 4.28 both ADDCON and LNT Solutions are developing Types II and IV ADF.

<sup>62</sup> Eg the ICIS MPG price index.

<sup>63</sup> For example, Kilfrost told us that the service level agreement with [REDACTED] specified that Kilfrost needed to have [REDACTED] tankers within two hours' drive of the airport

delivered). Kilfrost told us that customer contracts did not specify the minimum or maximum amount of ADF to be supplied and we have not seen any examples of minimum volume commitments in the contracts we have examined. Customers therefore often only pay for what they use and there are also no option payments in case of zero demand. ADF suppliers and some customers told us that, for this reason, even when a contract was in place, suppliers may generate very little or no sales when customers used ADF that they had in storage or when they did not require any ADF at all in a mild winter.

- 6.17 Therefore ADF suppliers largely bear the commercial risk resulting from the combination of high penalties for failure to supply (which lead suppliers to building up stocks at the beginning of the winter season) and potential low demand in mild winters (particularly in the UK).

#### *Competitive processes*

- 6.18 As explained in paragraph 2.63, a large proportion of UK ADF supplies is purchased by a small number of customers, which have contracts with suppliers. There is also a long tail of smaller customers that buy ADF at quoted prices on an occasional basis. These customers account for around [0–5]% of the Parties' UK sales, and to date only one of these [redacted] customers [redacted]. These customers are not discussed further below.
- 6.19 Both Clariant and Kilfrost told us that their marketing activities were [redacted]. Their sales activities consisted of [redacted]. We note that personal relationships are important in this process, as emphasised by Clariant.
- 6.20 Most of the purchase decisions of the customers of the Parties in the UK follow informal negotiations with the dedicated sales staff of ADF suppliers but some customers that buy larger amounts of ADF use formal tender processes to award ADF supply contracts. Kilfrost told us that it would start negotiating with customers for next season's contracts [redacted]. It told us that some contracts would involve a formal tender process, preceded by some informal discussions with various preferred suppliers, but in other cases customers may seek to renegotiate prices with their current supplier without inviting quotes from any other supplier. Some larger customers told us that they played suppliers off against each other in negotiations to obtain better offers.
- 6.21 One example of a formal tendering process where a customer was able to obtain a better offer through a formal tender process is [redacted] switch from [redacted] to [redacted] in [redacted]. In this case, [redacted] asked [redacted] to submit a proposal. This led to meetings, sales presentations and email exchanges between [redacted] and [redacted] through which an acceptable deal was found. [redacted] then contacted Kilfrost with

a view to obtaining a better offer from it. However, Kilfrost did not think that it could profitably compete with Clariant on the commercial terms in question. We have some evidence that [REDACTED]. This indicates that [REDACTED] was able to exert direct competitive pressure by directly playing off suppliers against each other and obtaining a very keen price from Clariant. Clariant told us that it had evaluated the profitability of the [REDACTED] contract on the basis of a contractual relationship with [REDACTED] over a [REDACTED] period, which may itself be indicative of significant switching costs and incumbency effects (discussed further in paragraphs 6.25 to 6.29 below).

- 6.22 We also received evidence from customers ([REDACTED]) that use strategic measures to constrain the incumbency position of their suppliers. [REDACTED]. [REDACTED] also told us that in the past it had adopted a dual-sourcing strategy and had split volumes by airport between Kilfrost and Clariant to maintain some competitive tension between ADF suppliers during the lives of the contracts, although this created some operational risks (as explained in paragraphs 4.15 and 4.16). A similar strategy was adopted by [REDACTED] in its [REDACTED] contract awards (see more detail in paragraph 6.53).
- 6.23 Bidding processes themselves may start with the customer requesting quotes,<sup>64</sup> with the consideration of security of supply issues being explored later on in the process (we saw examples of such an approach being taken by [REDACTED]).
- 6.24 Clariant has provided an example of a presentation that is shown to prospective customers to demonstrate its ability to meet security of supply requirements. We understand from [REDACTED] that it is typical for new suppliers to take such an approach, ie showing customers where the production and storage facilities are located, what the delivery times are between these and the customer site(s), and providing information on their logistics provider. We have also seen mentions of prospective customers visiting the production facilities of the Parties.

### *Switching*

- 6.25 Customers told us that they faced barriers to switching, including direct costs:
- (a) Most customers we spoke to mentioned the direct costs involved in the removal of remaining ADF, the cleaning of storage tanks (as different

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<sup>64</sup> Kilfrost told us that negotiations started with price before moving on immediately to discussions on security of supply.

fluids must not be mixed), and other operational costs associated with switching (eg re-labelling rigs, training of staff, or drafting new manuals).

(b) In addition, some customers mentioned specific barriers to switching that they face. For instance, [REDACTED] considered switching difficult as all of its customers (over 30) had to agree to the change of fluids and a switch would need to take place at all of the airports at which it operated. [REDACTED] mentioned that switching to a new supplier would be more difficult than switching to a previously used supplier as, for example, manuals could be used again and internal tests did not need to be re-run. Other customers mentioned barriers to switching arising from the requirement for pre-mixed ADF (see paragraph 4.24 above), or supplied in particular containers.

6.26 Some customers considered overall that these costs were significant for them and the barriers to switching were high. This was the case in particular for two of the major customers in the UK, [REDACTED].<sup>65</sup>

6.27 In addition, security of supply and dependability of operations is highly valued by customers, as explained above. We have received evidence from a number of customers that indicates that they perceive a switch, even to a qualified supplier, to be associated with uncertainty. For instance, [REDACTED] told us that it had to rely on the information that prospective suppliers presented to it when they sought an ADF supply contract. It considered that because of its experience with Kilfrost and Clariant, it did not have to investigate their capabilities, although it did undertake some research itself when its supplier (Kilfrost) changed the haulier used to supply [REDACTED] to assess whether the new company was a reliable partner. This risk was also highlighted in an email from [REDACTED] to [REDACTED] following a cold spell and a successful delivery [REDACTED]: the [REDACTED] procurement manager [REDACTED] noted that [REDACTED] the switch was the right decision, given the customer considered the change risky.

6.28 Other evidence indicates that previous relationships between suppliers and customers mattered in this market. Clariant told us that [REDACTED]. [REDACTED] told us that it entered into negotiations with [REDACTED] because a key member of staff at [REDACTED] was known to the company.

6.29 The existence of substantial switching costs is supported by the patterns of switching shown by the tender data we received from the Parties (see paragraph 6.45), covering the period from 2011 to 2015. Overall, the proportion of customers who switched away from the previous ADF supplier was relatively low ([REDACTED] switches out of [REDACTED] opportunities or 12%). Even if we

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<sup>65</sup> Opposing views received from: [REDACTED]

only consider cases in which customers considered other suppliers besides their current one when they negotiated or tendered, we still see that a substantial proportion of customers remain with the incumbent supplier.<sup>66</sup> This indicates that there is a substantial incumbency effect at play in this market.

### *Provisional conclusions on the nature of pre-merger competition*

- 6.30 The two key dimensions of competition are price and security of supply, as shown by the evidence we have received from customers and suppliers alike. In addition, to be credible the supplier must also have a product that meets the required quality standards (ie internationally recognised certification and approvals). In terms of processes, customers either simply renew their contracts with their current supplier following a renegotiation, or seek alternative quotes, either formally or informally.
- 6.31 Customers' willingness to pay for ADF is high (ie demand for ADF is relatively inelastic) due to the reputational damage and costs that may result from delays or cancellation of flights. Switching costs are also substantial, thus incumbents have a significant competitive advantage. Against this background, the evidence shows that prices are constrained through a number of mechanisms, including:
- (a) Where they have credible options, customers do seek to obtain better prices through negotiations, either informally or through formal tenders, and we have seen evidence that this has resulted in lower prices.
  - (b) In particular we have seen evidence that customers have been able to achieve better prices by playing off Clariant and Kilfrost.
  - (c) Some customers have taken steps to increase the options they have available (for example, dual sourcing) although customers have a limited ability to use such strategies.

### ***Theory of harm***

- 6.32 Theories of harm describe the possible ways in which an SLC could arise as a result of the Merger and provide the framework for our analysis of the

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<sup>66</sup> The data received from the Parties comprised [X] tenders (18%) where at least two suppliers competed and just four cases (5%) in which three suppliers competed ('competitive tenders'). The proportion of switches in a competitive tender increases significantly when two or more suppliers are competing (43% for two and 75% for three suppliers competing). The majority of customers did not switch suppliers ([X] out of [X] contracts). However, it also shows that when competition occurs, switching greatly increases. One contract was split such that at one airport a new supplier was trialled.

competitive effects of the Merger. In this case we have investigated one theory of harm:<sup>67</sup> the loss of a supplier of ADF to customers in the UK.

- 6.33 The concern under this theory of harm is that, as a result of the Merger, Clariant would have the ability to increase the price of ADF (or to submit less attractive bids) or otherwise worsen other elements of its offering (including security of supply), as compared with its and Kilfrost's pre-Merger offerings.
- 6.34 In general, for this theory of harm to hold, two conditions need to be met:
- (a) the merging firms are close competitors (ie they are considered to be good alternatives by customers); and
  - (b) other suppliers cannot replicate the competitive constraint that the merging firms exert on one another.
- 6.35 Clariant told us that it faced competition from a number of competitors and that considerable competitive constraint was exercised by potential competitors within Europe and beyond. It told us that Proviron, which had started supplying ADF in the UK in 2013, was a reliable and trusted manufacturer/supplier of runway and commercial de-icing products, which had entered into a partnership with a world leader in de-icing technology (Cryotech) and was actively marketing in the UK and successfully bidding for contracts. It also considered that even those providers that did not supply the full range of ADF types were also credible potential competitors in the UK. It added that all ADF suppliers were well placed to ensure supply chains and logistics arrangements were set up efficiently to ensure security of supply and manage risk. It considered that customers were misplaced in their concern that other providers could not ensure security of supply.<sup>68</sup>
- 6.36 To assess whether the two conditions set out in paragraph 6.34 are met, we obtained evidence from customers and suppliers on the competitive positions of Clariant, Kilfrost, ABAX, Proviron, LNT Solutions and ADDCON, in terms of shares of supply, level of competitive interactions in the UK (for those suppliers that are selling to UK customers) and the EEA and the competitiveness of their offerings. We first present the views of customers on the offerings of the different suppliers, before discussing specific evidence relating to product range and quality (including innovation), cost management, and supply chain management.

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<sup>67</sup> We explained in our [issues statement](#) that we were minded not to pursue two other theories of harm. We did not receive any evidence on these theories of harm in response to our issues and did not investigate these theories further.

<sup>68</sup> [Clariant initial submission](#), paragraphs 5.2, 5.3 & 5.9.

6.37 We sought to analyse the margins made by suppliers from different contracts to assess whether a higher number of competitors resulted in reduced margins. However, the data we obtained from the suppliers was not sufficiently complete and the competitive bids were too few to enable us to conduct any meaningful analysis.

### *Current market positions*

6.38 The Parties provided us with share of supply estimates for the years 2010/11 to 2014/15. We complemented this with evidence from customers and other suppliers to derive our own estimates (presented in Table 2 below). This showed that in 2014/15 Kilfrost and Clariant had a share of supply in value of [90–100]% in the UK, Proviron having the remaining [0–5]%. Based on our understanding of the contracts that have moved since then, we estimate that in 2015/16 Proviron had [0–5]% of ADF sales in the UK.

**Table 2: Share of supply estimates (UK) by value**

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/2016
Kilfrost	[90–100]	[90–100]	[70–80]	[70–80]	[70–80]	[70–80]
Clariant	[<]	[<]	[<]	[<]	[<]	[<]
<b>The Parties</b>	<b>[90–100]</b>	<b>[90–100]</b>	<b>[90–100]</b>	<b>[80–90]</b>	<b>[90–100]</b>	<b>[90–100]</b>
Other competitors	[5–10]	[5–10]	[5–10]	[10–20] *	[0–5]	[0–5]

Source: Parties and third parties.

\*Last year during which ABAX supplied ADF in the UK and year of Proviron's entry.

6.39 We used analysis provided to us by the Parties, combined with information received from other suppliers and data on purchases of MPG, to estimate their share of supply in the EEA in 2014/15, as shown in Table 3 below. We found that overall the share of supply of Clariant and Kilfrost in 2014/15 was [80–90]%.

**Table 3: Shares of supply (in volume terms) of ADF suppliers in the EEA in 2014/15**

	2014/15
Clariant	[50–60]
Kilfrost	[30–40]
ABAX	[5–10]
Proviron	[0–5]
LNT Solutions	[<1]
ADDCON	[<1]

Source: CMA analysis based on ADF and MPG suppliers' data.

6.40 Kilfrost told us that there were significant differences in the shares of supply of the different suppliers in different regions of the EEA, and that large contracts could have a significant impact on shares:

- (a) In Germany, Kilfrost had a larger share ([redacted]%) of supply than Clariant ([redacted]%), because it served, which required large volumes. Clariant served most of the other airports.
- (b) ABAX had a large share ([redacted]%) of French ADF sales because it held the [redacted] which accounted for the lion's share of volumes. Clariant was the second largest supplier ([redacted]%) and Kilfrost had a small share ([redacted]%).
- (c) In the Benelux countries, Clariant and ABAX had similar large shares ([redacted]%) and Kilfrost a much smaller one ([redacted]%). In that region, [redacted], which was served by [redacted], was the largest customer with other customers accounting for small volumes.
- (d) The [redacted] contract gave Kilfrost a higher share in Austria.

6.41 Clariant told us that ABAX supplied ADF to [redacted] in France. In addition to [redacted], it also had customers in [redacted]. With regard to Proviron, Clariant identified [redacted]. As for LNT Solutions, it had served [redacted] Clariant did not have any information on ADDCON's competitive position.

6.42 Although we have not sought evidence on competition beyond the boundaries of the EEA, as we did not consider this to be directly relevant to our assessment, we noted an analysis of shares of supply carried out by Clariant in January 2013. This estimated that globally, Clariant had a share of ADF sales of [50–60]%, Kilfrost, [20–30]% and other suppliers [10–20].

### *Competitive interactions*

6.43 The data presented above shows that the current shares of supply of the Parties are very high, both in the UK and the EEA. High shares of supply may overstate market power if shares can and do move rapidly. The supply of ADF is characterised by the preponderance of large contracts and a concentrated customer base. This means that some relatively significant changes in shares of supply can occur rapidly when these customers change supplier. To some extent this has been seen in the UK, where Clariant was able to achieve a reasonable size following its entry by attracting a small number of large customers. However, aside from this change, shares of supply in the UK have been stable over time.

6.44 It is possible that stable shares of supply could conceal more intense competition if there is frequent switching by customers but this results in little change in overall shares of supply. We therefore examined evidence on the extent of switching and intensity of competition between suppliers, as evidenced by Clariant's internal documents and comments made to us by the various suppliers of ADF in the EEA.

## Competitive interactions in the UK

- 6.45 The Parties submitted information on bids made and quotes given for ADF supply contracts in the UK in the years 2011 to 2015. The dataset comprises information on [redacted] contracts that were awarded following either formal ([redacted] out of [redacted] contracts) or informal ([redacted] out of [redacted] contracts) tenders or negotiations.<sup>69</sup> We also obtained information from customers and other suppliers to complement this dataset, and in particular in order to capture more recent developments. Although the number of contracts that have been competed for is small, they account for a very high proportion of the sales of ADF in the UK: we estimate that contracts amounting to almost [70–80]% of the Parties' sales volumes for the 12 months to December 2015, have been the subject of competition since 2011.<sup>70</sup>
- 6.46 We note first that the bidding data (together with information from customer responses) indicates that in total in the UK only [redacted] customers (out of approximately [redacted]) have dealt with<sup>71</sup> ADF suppliers other than Kilfrost and only [redacted] of those have dealt with suppliers other than Kilfrost and Clariant.<sup>72</sup>
- 6.47 Table 4 shows whether customers switched between suppliers or retained their present supplier (this table does not include a number of contracts where there was no incumbent or no data on the previous supplier). The analysis shows that, since 2011, Kilfrost has lost [redacted] contracts to competitors: [redacted] to Clariant ([redacted] of which were won in [redacted]) and [redacted] to Proviron. Clariant has lost [redacted] contract to Proviron. In addition, Proviron is being [redacted] customer and won a contract serving [redacted] (neither of which is reported in the table). Proviron has lost [redacted] contracts: [redacted] to Clariant ([redacted]) and [redacted] to Kilfrost ([redacted]).

**Table 4: Overview of customer switching**

	<i>Winner</i>	<i>Kilfrost</i>	<i>Clariant</i>	<i>Proviron</i>	<i>ABAX</i>
<b>Incumbent</b>					
<b>Kilfrost</b>		[redacted]	[redacted]	[redacted]	[redacted]
<b>Clariant</b>		[redacted]	[redacted]	[redacted]	[redacted]
<b>Proviron</b>		[redacted]	[redacted]	[redacted]	[redacted]
<b>ABAX</b>		[redacted]	[redacted]	[redacted]	[redacted]

Source: CMA analysis of data from the Parties.

- 6.48 In 2015/16, Proviron [redacted] supply contracts: [redacted].

<sup>69</sup> 28 contracts were not classified as either having been awarded following formal or informal tendering.

<sup>70</sup> That is, volumes that were supplied under a contract for which at least two suppliers competed.

<sup>71</sup> Have had contact with or bought from.

<sup>72</sup> This includes any customer that the CMA became aware of during the inquiry who received quotes, bought from or switched away from a supplier other than Kilfrost.

- 6.49 In autumn [REDACTED], Clariant won the [REDACTED] contract in the UK (worth £[REDACTED] million) for the supply of [REDACTED] ADF to [REDACTED]. We asked Kilfrost for the price it bid for the [REDACTED] contract at the time but were not able to obtain reliable information. We understand however that Clariant's bid was lower at €[REDACTED] (£[REDACTED]) per litre and an internal document of Clariant noted: 'this is a considerable price saving to [REDACTED]. [REDACTED].<sup>73</sup> In addition, Clariant offered an innovative ADF product which had better holdover times as well as colour coding properties (which allowed the user to see which parts of the aircraft had been de-iced) compared to Kilfrost. In attempting to keep [REDACTED], Kilfrost eventually matched the holdover times of Clariant's ADF product.
- 6.50 Although [REDACTED] received an unsolicited bid from Kilfrost in spring [REDACTED], Clariant retained the contract by offering a lower price. Clariant recorded that 'although we are preferred supplier, terms offered by Kilfrost are so favourable that [REDACTED] requested revised offer from us'. As a result of negotiations with [REDACTED], Clariant decreased its price to [REDACTED] from €[REDACTED] (£[REDACTED]) to €[REDACTED] (£[REDACTED]) per litre.
- 6.51 In [REDACTED] invited Kilfrost and Clariant to bid. Clariant won the contract (offering prices of £[REDACTED] per litre for Type I and £[REDACTED] per litre for Type IV), which was renewed in [REDACTED]. In [REDACTED] invited Kilfrost, Clariant and Proviron to bid to supply ADF at [REDACTED]. Clariant won, offering prices of £[REDACTED] for Type I and £[REDACTED] for Type IV and [REDACTED]. The second lowest offer came from Proviron (Type I: £[REDACTED] and Type IV: £[REDACTED]) with Kilfrost making the highest offer (Type I: £[REDACTED] and Type IV: £[REDACTED]).
- 6.52 [REDACTED] sourced its ADF from Kilfrost without seeking alternative bids. Following a price increase in [REDACTED] switched to Clariant which offered £[REDACTED] for Type I ADF and £[REDACTED] for Type IV. In [REDACTED] asked for quotes from only Proviron and Clariant. Proviron won the contract [REDACTED].
- 6.53 In September [REDACTED] put out a contract for Type I and Type IV ADF [REDACTED] and invited Clariant, Kilfrost, Proviron, ABAX, Dow Chemical, LNT Solutions and Cryotech to bid. Only the bids made by Clariant and Kilfrost were considered. Clariant's bid price was €[REDACTED] (£[REDACTED]) and it also offered to [REDACTED]. Kilfrost's bid was £[REDACTED] (around €[REDACTED]). Kilfrost was chosen for [REDACTED]. Clariant was chosen to supply [REDACTED] in the UK because [REDACTED].
- 6.54 [REDACTED] bought ADF from Proviron for its operations in [REDACTED]. For other locations, it bought ADF from Kilfrost. In [REDACTED],[REDACTED] put out an [REDACTED] tender, for which Clariant was not selected because it does not supply pre-mixed ADF.<sup>74</sup> Kilfrost won

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<sup>73</sup> We note that Clariant evaluated the profitability of the contract [REDACTED] (see paragraph 6.21). See Appendix D, paragraph 86 for our assessment of the profitability of the [REDACTED] contract for both Parties.

<sup>74</sup> [REDACTED] We note however, that due to not meeting the customer's requirement for diluted ADF, the customer would have had to incur additional costs for dilution.

the contract with prices of: £[REDACTED] for Type I, £[REDACTED] for Type II and £[REDACTED] for Type IV. [REDACTED] had received significantly lower offers from ABAX (£[REDACTED] for Type I) and Proviron (£[REDACTED] for Type I) but it told us that [REDACTED].

- 6.55 [REDACTED] told us that it had been a customer of Kilfrost for [REDACTED] years but that it was [REDACTED] Proviron's [REDACTED] product [REDACTED]. It was happy with Kilfrost as a supplier but felt that, commercially, it made sense to have a secondary supplier in place. [REDACTED].
- 6.56 Clariant also had informal discussions with [REDACTED] in late [REDACTED] but these did not come to fruition and there were no further discussions in subsequent years. The evidence we have seen however, implies that Clariant [REDACTED].
- 6.57 Prior to 2010/11, ABAX's distributor, Esseco, had purchased ABAX's product ex-works, taken all commercial risks and managed customer relationships, in particular with its key customer, [REDACTED]. After the relationship between ABAX and Esseco ceased in 2010/11, ABAX served [REDACTED] directly on a rolling contract. ABAX subsequently lost the contract to Kilfrost in 2014 when [REDACTED]. [REDACTED] told us that Kilfrost was able to offer a more competitive rate than ABAX for 75:25 pre-mix. [REDACTED].

### *Europe*

- 6.58 Kilfrost told us that in the EEA the companies it came across regularly in competitive processes were Clariant and ABAX, and that Proviron and ADDCON had won some small contracts. It told us that Clariant was a strong competitor across the whole of Europe. It considered that ABAX was a strong competitor [REDACTED] countries but not in the UK due to its failure to supply customers in winter 2010/11, which had seriously damaged its reputation among customers. The internal analysis of shares of supply by country that its salesforces carries out annually supports these assessments. We noted that activities of Proviron, ADDCON and LNT Solutions were not recorded in this analysis, which implies that Kilfrost does not regard them as significant competitors.
- 6.59 Clariant's internal documents indicate that it perceives Kilfrost as its main competitor across geographies:
- (a) An email exchange dated October 2012 implies that Clariant viewed Kilfrost as an important competitor across North America and Europe: [REDACTED].
  - (b) In November 2012, [REDACTED], [REDACTED] at Clariant identified Kilfrost's key customers as targets for Clariant's sales efforts at [REDACTED] locations throughout Europe: [REDACTED]. No such targets were identified for other suppliers.

(c) Clariant's monthly reports state on several occasions that Kilfrost is competing aggressively across Europe following the loss of the [REDACTED] contract. They also show that Kilfrost and Clariant compete frequently against each other, and that both win and lose some bids.

(d) In January 2013, one of its business reports included [REDACTED] and shares of supply globally (reported in paragraph 6.42 above).

6.60 No other supplier is referred to by Clariant as frequently in its monthly reports as Kilfrost, although increased competition from LNT Solutions, ADDCON and Proviron was recorded in the past few months.<sup>75</sup> It appears that [REDACTED], but Proviron and ADDCON are mentioned in relation to ADF contract losses:

(a) Proviron is mentioned occasionally in relation to specific contracts [REDACTED]. ABAX is only mentioned in relation to customers in [REDACTED] and [REDACTED], with only very few exceptions (eg in [REDACTED]). ADDCON is only mentioned in relation to bids in [REDACTED]. LNT Solutions is mentioned in relation to contracts in [REDACTED]. Boryszew is mentioned as being 'active' in [REDACTED]. In relation to the UK, only Kilfrost and Proviron are mentioned.

(b) Aggressive competition by LNT Solutions, Proviron or Boryszew is mentioned only occasionally and sometimes in relation to specific countries or regions.

(c) A technical comparison of ADF products of February 2015 lists as competitors ABAX, Cryotech, Kilfrost, Dow Chemical, and LNT Solutions but not ADDCON. ABAX is referred to as competing in [REDACTED] countries, Cryotech in the USA and (through [REDACTED]) Europe, LNT Solutions in the USA, and only Kilfrost as competing globally.

6.61 The evidence we received from other suppliers and [an EEA customer] indicates that suppliers other than Kilfrost and Clariant focus on certain geographies:

(a) ABAX: [REDACTED]. ABAX told us that it supplied primarily to France and the Benelux countries, but also to Italy, Spain, Hungary, Romania and the Czech Republic. ABAX told us that it would not be able to compete in [REDACTED] because [REDACTED].

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<sup>75</sup> In Clariant's monthly reports during season 2015/16, Kilfrost was mentioned [REDACTED] times, Proviron [REDACTED], ABAX [REDACTED], LNT Solutions [REDACTED], ADDCON [REDACTED] and Boryszew [REDACTED] times. Between January 2014 and March 2016, Kilfrost was mentioned [REDACTED] times, Proviron [REDACTED], ABAX [REDACTED], LNT Solutions [REDACTED], ADDCON [REDACTED] and Boryszew [REDACTED] times.

(b) Proviron: [REDACTED]. Proviron told us that that its high priority expansions geography was Belgium and areas as close as possible to Belgium, such as the Netherlands, northern France, the UK, Luxembourg and Germany. It had recently also picked up a lot of new business and supplied customers in [REDACTED].

(c) LNT Solutions: it told us that in Europe it planned to target [REDACTED].<sup>76</sup>

(d) ADDCON: it told us that it currently sold Type I ADF to [REDACTED] German airports.

6.62 [REDACTED] told us that it used Kilfrost and Clariant ADF, as did most German airports. In its view, there was no difference between Kilfrost and Clariant. Every year [REDACTED] had to buy from Kilfrost and Clariant, as they were the only suppliers that could meet its needs. [REDACTED].

#### *Customer views on the overall offerings of the Parties and other suppliers*

6.63 We consider that the overall offerings of ADF suppliers are differentiated (see paragraphs 6.3 to 6.12) and consist of a number of elements that comprise the ADF product itself, price and other contract terms, additional services and other non-price elements. We also consider that customers have different preferences for these elements and the evidence we have received suggests that they assess all of these before entering into a contractual relationship with an ADF supplier.

6.64 In particular, evidence we have received from customers shows that customers' perception of the level of security of supply offered by the supplier, and the supplier's supply chain are highly relevant in customers' assessment of alternative offerings from ADF suppliers (see paragraphs 6.6 to 6.9). [REDACTED]. Therefore, we consider that it is particularly appropriate to assess the closeness of competition between ADF suppliers by taking into account the views of customers about the capability of different suppliers.

6.65 The CMA contacted a number of ADF customers in the UK and asked them to score suppliers (using scores between 0 (worst score) and 5 (best score)) on a range of parameters (see Figure 3). We received responses from ten customers which account for over 80% of ADF sales in the UK and include most of the major users of ADF in the UK.

6.66 For almost all categories, Kilfrost scores highest [REDACTED], above Clariant [REDACTED], Proviron [REDACTED], and ABAX [REDACTED]. Kilfrost received on average the highest scores

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<sup>76</sup> [LNT Solutions hearing summary](#), paragraph 14.

in all categories except for ('additional services')<sup>77</sup> which was driven by a low score given by [REDACTED].

**Figure 3: Average scores given by customers (sample size=10)**

[REDACTED]

Source: CMA analysis of customer questionnaires.

- 6.67 The customers rated Kilfrost highly across measures that reflect a strong offering in terms of local manufacturing, storage, and logistical capabilities (see 'supply chain', 'storage', and 'delivery lead times'). Generally Clariant received lower scores than Kilfrost, except in relation to 'additional services', which may be linked to [REDACTED].
- 6.68 When only the scores of those customers that had actual experience with a supplier are considered the overall ranking of the suppliers across categories does not change materially. Kilfrost remains ahead of Clariant and both companies score higher than ABAX and Proviron. However, ABAX would be ranked third [REDACTED] before Proviron [REDACTED]. This is due to the high score given to ABAX by [REDACTED] for [REDACTED].
- 6.69 As mentioned above, Proviron received an average score of [REDACTED] from all customers, which is below the scores given to Kilfrost and Clariant, but similar to that of ABAX [REDACTED]. Proviron scores [REDACTED] on [REDACTED] compared to its competitors.
- 6.70 Other (potential) suppliers of ADF, LNT Solutions and ADDCON, are virtually unknown by customers.<sup>78</sup> None of the customers who responded had bought ADF from them and their scorings might therefore have been based on their knowledge of these companies' other products or hearsay.
- 6.71 Overall, the results show that customers score Kilfrost highest on average and Clariant is scored relatively closely. ABAX and Proviron received lower scores on average and there is a greater (arithmetic) distance between ABAX or Proviron and Clariant than there is between Clariant and Kilfrost.
- 6.72 We have also received specific comments that are consistent with the above ratings from a number of customers:
- (a) [REDACTED] which buys large volumes of ADF Type IV told us that it currently believed only Clariant and Kilfrost would be able to meet its ADF

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<sup>77</sup> We asked customers to specify 'additional services' but the majority did not respond.

<sup>78</sup> We asked customers to list suppliers of ADF that they had approached or that approached them and for suppliers that they have bought from. Only one customer [REDACTED] mentioned LNT Solutions as a supplier that they approached.

requirements, which may be up to in the region of [REDACTED] litres in a winter with extraordinary snow fall.

- (b) Similarly, [REDACTED], which is not a direct customer for ADF in the UK, considered that only Kilfrost and Clariant were able to meet its requirements.
- (c) [REDACTED] told us that ABAX/Esseco had no real sales staff in the UK and did not show interest when they were contacted.
- (d) [REDACTED] told us that Proviron's ADF [REDACTED].
- (e) A number of customers mentioned that ABAX had supply problems in the winter of 2010/11.

6.73 The evidence set out in paragraphs 6.63 to 6.72 therefore indicates that Clariant's and Kilfrost's offerings are seen as good alternatives by UK customers and that ABAX and Proviron's offerings are not perceived by them to be as good.

#### *Product range and quality*

6.74 Clariant offers several ADF products of Types I, II, and IV under the 'Safewing' brand. Kilfrost offers several ADF products of Types I ('Kilfrost DF'), II and IV ('Kilfrost ABC').

6.75 Proviron offers ADF Types I, II, and IV (marketed as 'Cryotech Polar Plus' and 'Cryotech Polar Guard').<sup>79</sup> ABAX provides ADF Types I, II, and IV (marketed as 'DS-950' and 'Ecowing').<sup>80</sup>

6.76 ADDCON and LNT Solutions currently only offer Type I ADF products but are developing Types II and IV products.

6.77 Kilfrost offers its ADF products as concentrated fluids in 100:0, or pre-mixed fluids in 75:25, 60:40, and 50:50 dilution ratios. Clariant informed us that it did not offer pre-mixed fluids in the UK [REDACTED]. It notes in internal documents that this is the reason why it did not compete for certain ADF supply contracts.

6.78 We also understand that products of the same type of ADF, in particular Type II and IV products, have different properties that may impact on their effectiveness and the competitiveness of suppliers. For instance:

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<sup>79</sup> See [www.proviron.com](http://www.proviron.com) (retrieved 05/05/2016).

<sup>80</sup> See FAA (2015): Holdover Time Guidelines Winter 2015-2016.

- (a) we heard that [REDACTED] ADF did not perform satisfactorily when mixed with water at [REDACTED].
- (b) [REDACTED] had problems with the [REDACTED] of [REDACTED] product at [REDACTED] Airport, and trials were undertaken to solve this issue;
- (c) Finnair required a 'specific foaming stability' of [REDACTED] product; and
- (d) as explained in paragraph 6.49, Kilfrost [REDACTED] in an attempt to re-win the [REDACTED] contract [REDACTED].

6.79 We understand that manufacturers engage in research and development to improve the properties of their existing ADF products, to adapt the properties of these products to the needs of individual customers, and to develop new ADF products. In the presentations of the Parties and during a site visit we have seen that they both employ professional chemists. We have also seen internal documents showing that Clariant's research and development is, for instance, [REDACTED]. Moreover, Clariant's internal documents show that it monitors Kilfrost's research and development activities; [REDACTED].

#### *Cost management*

- 6.80 We analysed the costs of the different suppliers to identify differences between their cost structures and whether any of the suppliers had a significant cost advantage over the other competitors. We set out in this section some of the major cost factors that are relevant in the production of ADF. Our analysis is set out in detail in Appendix D.
- 6.81 Differences we observed between the manufacturers' variable costs of production are largely due to cost advantages in MPG purchases and transport costs. In particular, we note that Clariant [REDACTED].
- 6.82 We analysed the production costs (excluding raw materials) of a number of suppliers and noted some differences between the suppliers (eg due to different labour costs or economies of scale and scope). We estimated that for the production of Type IV ADF, the costs incurred by Clariant were [REDACTED] than those incurred by Kilfrost.
- 6.83 We estimated that for Type IV, Clariant's total variable cost of production (including MPG purchase) was [REDACTED] than Kilfrost's.
- 6.84 We also received information from suppliers on transport and logistics costs. Greater distance between the manufacturing site and the customer leads to higher transport cost. A higher number of storage sites and tank containers used and a longer storage time increase the logistics cost, and also increase

the working capital cost of holding (unsold) ADF stocks. On the other hand, more storage sites and more storage capacity may enable manufacturers to even out peaks of demand across regions, respond to orders more quickly, or increase resilience of the supply chain in adverse weather conditions. From the information we received from Kilfrost and Clariant we provisionally conclude that transport and logistics costs are significantly lower for Kilfrost for supplying to customers in the UK due to the location of its manufacturing plant in the UK and its ability to deliver in many cases directly to customers without the use of depots in the UK.

- 6.85 We therefore consider that the Parties have each different cost advantages and disadvantages when they supply customers in the UK. The net effect will depend on a number of factors (eg the price of MPG and exchange rates). At this stage we consider that both Parties are able to effectively compete in the supply of ADF to customers in the UK.
- 6.86 The information we received from other suppliers is not of sufficient quality to enable us to comment on their production and delivery costs.

#### *Supply chain management*

- 6.87 As explained in paragraphs 6.7 to 6.10, security of supply is a key customer requirement. We discuss in this section what good supply chain management for ADF entails in practice and the capability of the various EEA suppliers in this respect.
- 6.88 Kilfrost told us that new customers wanted to know how the supplier would get the ADF products delivered to them and having a proven logistics network was important to win business. Clariant told us that when it came to convincing a customer to switch, it all came down to having a reliable supply chain. It also told us that it was possible to win contracts without having an infrastructure in place, as shown by its successful tender for the [REDACTED] contract.
- 6.89 [REDACTED] told us that the supply chain for de-icing fluid must be able to cope with sudden peaks in demand due to adverse weather with little advance notice. This automatically meant its de-icing fluid supplier must have:
- (a) a storage facility in the UK at a location convenient for delivery to [REDACTED];
  - (b) a supply route that was likely to remain open during the weather event impacting [REDACTED] operation;
  - (c) the logistical capacity to get the fluid to [REDACTED] (and its other customers who would also be demanding extra quantities);

- (d) scale to hold a high level of buffer stock;
  - (e) the financial wherewithal to commit capital to that stock holding; and
  - (f) a supply chain for the fluid ingredients that ensured it could re-stock quickly as buffer stock got drained.
- 6.90 [X] told us that it had a long history with both Clariant and Kilfrost. There was no difference between them: both had been in the business for a very long time, had excellent supply lines, production and logistics concepts. Managing the various aspects of the supply chain, from production site to storage sites and the movement of trucks was a core competency of Clariant and Kilfrost.
- 6.91 [X] told us that one key issue with other suppliers, was that because they were small, they did not have ready access to the raw material or logistics network to ensure reliable delivery.
- 6.92 [X] commented in relation to its recent tender that [X] was unable to commit to service levels that [X] would want, principally due to the location of its manufacturing and distribution facilities. The distance between its facilities and delivery destinations was unacceptable.
- 6.93 Kilfrost told us that ensuring security of supply involved three elements. Access to MPG, which was in finite supply, manufacturing and delivering the finished product to customers. The three needed to be managed to ensure that when a customer ran out of stock, in whatever circumstances, the supplier could continue to deliver volumes to customers on time by re-allocating tankers across its logistics network. Managing a logistics network was not straightforward: for example, haulage companies did not want trucks to be in their yards for too long, there were rules and regulations and knowledge of the capability of the haulage companies in different geographies was important.
- 6.94 Kilfrost told us that it had proven that it was able to do this, while others had not been able to (eg LNT Solutions had failed to deliver products on time to Düsseldorf three years previously). Because UK customers were relatively close to its plant at Haltwhistle, Kilfrost only needed [X] to [X] tankers there. In mainland Europe, it had [X]: in addition to its manufacturing facility in Haltwhistle near Newcastle Upon Tyne, the UK and a third-party blending facility (producing ADF Type I) in Antwerp, [X].
- 6.95 Clariant told us that its key message to potential customers was consistent: [X]. As part of its negotiations with [X], Clariant gave two presentations showing not only the major components of its supply chain from its manufacturing plant in [X] to [X] (via [X]), but also its overall logistics

capability. These presentations demonstrated its overall approach to production and logistics management and highlighted [REDACTED]. The presentation also explained [REDACTED]. Clariant told us that when becoming aware of particularly adverse upcoming weather conditions (usually two weeks in advance), it would [REDACTED].

6.96 In contrast to Clariant and Kilfrost which both have an extensive network of facilities in place and proven expertise in managing the peaks and troughs in demand that they are able to demonstrate in tenders, other suppliers' on-the-ground infrastructure and related supply chain management expertise is limited:

- (a) Proviron only has a manufacturing site and warehouse in Belgium from which it supplies mainland Europe.
- (b) Similarly, ABAX only has a small plant to the south-east of Paris. Esseco told us that when it distributed from ABAX, it bought the products ex-works from ABAX's plant in France. ABAX confirmed that the facilities (in Scotland, Wales, Northern Ireland and London) that had been used in the UK to store ABAX products had belonged to Esseco.
- (c) To our knowledge, ADDCON serves its [REDACTED] customers from its production facility in Germany, using [REDACTED], and has no other logistical capability.
- (d) LNT Solutions told us that it used [REDACTED].<sup>81</sup>

6.97 We therefore consider that Kilfrost and Clariant have a significant competitive advantage resulting from their supply chain management capability. When competing for new contracts, the incremental cost of adding one more facility (eg [REDACTED]) to their network is relatively low. Other suppliers would need to put in place the infrastructure and processes necessary to manage the peaks and troughs in demand. Other suppliers also lack the track record to convince customers that they would be capable of operating this supply chain effectively in adverse weather conditions.

#### *Provisional conclusions on the effects of the merger*

6.98 Clariant and Kilfrost are the two largest suppliers of ADF, not only in the UK where their share of supply exceeds 90%, but also in the EEA, and perhaps globally. Their share of supply in the EEA is well in excess of 80%. Between

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<sup>81</sup> [LNT Solutions hearing summary](#), paragraph 15.

them they hold most of the large customer contracts across the EEA (including the UK).

- 6.99 The evidence shows that they regard each other as close competitors (see paragraphs 6.58 and 6.59). We have seen extensive evidence of intense competition between them, at least for large contracts (which account for a high proportion of ADF sales) both in the UK and the EEA. When they compete, it is across all aspects of their offering: price, product and service quality and innovation (see for example paragraphs 6.49 to 6.54, 6.62 and 6.79).
- 6.100 The combination of a long-term track record in the supply of ADF, a large customer base and an extensive and well-established logistics infrastructure give both Kilfrost and Clariant significant competitive advantages over their competitors.
- 6.101 The two companies have different strengths and weaknesses, which will play out in competitive processes: our analysis showed that Clariant [REDACTED] with a significant competitive advantage arising in particular from [REDACTED], albeit offset by [REDACTED]. Kilfrost on the other hand has a local advantage when supplying customers in the UK due to the proximity of its manufacturing site. It has also an extensive [REDACTED] that give it a strong reputation as a reliable supplier.
- 6.102 Other suppliers are viewed by customers in the UK as more distant competitors across all aspects of their offerings. They also have significantly more limited geographic footprints, and have not (yet) been able to establish a large customer base or logistical infrastructure, or to prove their ability to deliver ADF reliably in difficult weather conditions. The evidence we have received about the competitive landscape in continental Europe indicates that their respective positions are not significantly stronger in other countries, with the exception of ABAX which is the largest supplier in France and has a strong presence in the Benelux countries. From a UK perspective though, ABAX is weak across all dimensions of its offering (other than price for some customers). Its reputation has also suffered [REDACTED].
- 6.103 Given the high switching costs faced by customers and the importance of reputation and an extensive logistics infrastructure to be able to win customers, we do not consider that the threat of entry is a source of competitive constraint in the supply of ADF in the UK.
- 6.104 We therefore consider that the Merger may be expected to result in competition concerns because of the loss of one of the only two suppliers that are reliably able to meet all the requirements of ADF customers in the UK. Such competition concerns are amplified by the strong presence of the

Parties across the EEA, because it gives them a significant competitive advantage in terms of reputation and logistics, which cannot be called upon by other suppliers when competing in the UK.

## 7. Countervailing factors

### *Entry and expansion*

7.1 In assessing whether entry or expansion might prevent an SLC, our guidelines set out that we will consider whether such entry or expansion would be timely, likely, and sufficient.<sup>82</sup>

(a) **timely:** whether entry or expansion can be ‘sufficiently timely and sustained to constrain the merger firm.’ The guidelines note that: ‘The Authorities may consider entry or expansion within less than two years as timely, but this is assessed on a case-by-case basis, depending on the characteristics and dynamics of the market, as well as on the specific capabilities of potential entrants.’<sup>83</sup>

(b) **likely:** whether firms have the ‘ability and incentive to enter the market’;<sup>84</sup> and

(c) **sufficient:** whether the scope or scale of entry or expansion would be sufficient to act as a competitive constraint.<sup>85</sup>

7.2 Clariant told us that the barriers to entry or expansion in the UK were low. In brief, the key to supplying UK customers was to set up adequate logistics capabilities, which could be done by subcontracting and/or renting from third parties with relative ease and little expense, as the example of Clariant’s entry into the UK demonstrated.

7.3 It told us that it faced competition from a number of competitors and considered that there were effective and credible, and actual and potential competitors that would challenge Clariant post-Merger.<sup>86</sup> It said that the most likely new entrants would be existing ADF suppliers from Europe and/or the world; and existing suppliers of adjacent products such as runway de-icers or MPG.<sup>87</sup> Having listed nine actual and potential competitors in its Merger Notice, in its submission to us it referred specifically to Proviron, ABAX, LNT

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<sup>82</sup> [Merger Assessment Guidelines](#), paragraph 5.8.3.

<sup>83</sup> [Merger Assessment Guidelines](#), paragraph 5.8.11.

<sup>84</sup> [Merger Assessment Guidelines](#), paragraph 5.8.8.

<sup>85</sup> [Merger Assessment Guidelines](#), paragraph 5.8.10.

<sup>86</sup> Clariant initial submission, paragraph 5.1.

<sup>87</sup> Clariant initial submission, paragraph 6.1.

Solutions, ADDCON, Boryszew, AllClear Systems and De-Icing Solutions as companies that were most likely to expand (in the case of Proviron) or start supplying (in the case of all other suppliers) in the UK.

- 7.4 Clariant told us that Proviron was a very strong potential competitor because it had all the necessary elements to succeed: the reputation of Cryotech, UK-based sales staff, and experience of winter related products, ie runway de-icing fluid. Clariant also told us that LNT Solutions, a UK company, would likely be a competitive constraint following the approval of its Type II and IV ADF in the next 6 to 12 months. Furthermore, it said entry by ADDCON and ABAX could be entirely possible and likely in the medium term.<sup>88</sup>
- 7.5 Kilfrost told us that there had been limited entry and exit in the UK and that it was not aware of any competitor strategy for sizeable entry into or expansion in the supply of ADF in the UK in the next three years.<sup>89</sup>
- 7.6 In order to reach a view, we first considered what barriers to entry and expansion exist in relation to the supply of ADF in the UK, the detail of which is set out in Appendix E, with overall conclusions summarised in paragraphs 7.8 to 7.22. We also sought evidence from ADF suppliers on their entry and expansion plans (see paragraphs 7.24 to 7.34). In making our overall assessment (as set out in paragraphs 7.35 and 7.36), we also took into account the current competitive position of those suppliers within the EEA and UK (and in particular their track record and reputation as set out in our competitive assessment).

### *Barriers to entry and expansion*

- 7.7 In line with our guidance,<sup>90</sup> we have assessed four types of barriers to entry and expansion: structural and strategic barriers, economies of scale, technical barriers and legal barriers. The detail of the evidence we have reviewed is set out in Appendix E. We summarise the assessment below and we set out our provisional views on those barriers in paragraphs 7.20 to 7.22.

#### *Structural and strategic barriers*

- 7.8 The evidence we have received (set out in paragraphs 10 to 76 of Appendix E) shows that the set-up costs for manufacturing ADF products are high. The set-up costs for a manufacturing facility for Type I ADF are around [redacted]. Also, if a manufacturer already has the ability to produce concentrate, then such a

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<sup>88</sup> [Clariant initial submission, paragraph 6.4.](#)

<sup>89</sup> [Kilfrost initial submission, paragraphs 6.8–6.10.](#)

<sup>90</sup> [Merger Assessment Guidelines, paragraph 5.8.5.](#)

facility could require an additional investment of approximately €[REDACTED] (£[REDACTED]) for it to manufacture Types I, II and IV ADF (see paragraph 12 of Appendix E for evidence from ADDCON).

- 7.9 Nevertheless, for an operator with existing operations in the EEA, in principle, expansion into the UK could be achieved without building a manufacturing facility in the country, which would significantly lower its set-up costs. In the first instance, a supplier could use a logistics company to transport and store products close to customers. The evidence that we have received also indicates that the rental costs of storage itself are relatively modest and that transportation costs are not so high that competitors cannot win contracts in the UK. There are nevertheless some question marks relating to the competitiveness of importing pre-mixed products against those manufactured in the UK (as explained by [REDACTED]).
- 7.10 We have received evidence from ADDCON that to grow further a supplier may need to build local blending capability, which is typically achieved through a partnership with a local company. For example, Clariant uses [REDACTED] in Rauma, Finland, to produce Type I and Kilfrost uses [REDACTED] in Antwerp, Belgium, to produce Type I. LNT Solutions has facilities with [REDACTED]. There may however be difficulties in identifying local partners in the UK, as Esseco told us that it was not a profitable activity and Clariant was not able to identify potential manufacturing partners in the UK, other than Esseco. In addition, Clariant told us that, having considered this option itself, it decided that for an ADF supplier with a manufacturing base in the EEA, a solution that was more economic and more secure in supply terms was to transport the finished product from its existing plant and store locally.
- 7.11 As explained in paragraphs 6.6 to 6.9, security of supply is an important concern for customers who, in choosing a supplier, take account of its reputation and track record of reliable deliveries, particularly in adverse weather conditions. In our view, this requirement constitutes a significant barrier to entry and expansion, as risk-averse customers seek to remain with long-term suppliers and will generally be unresponsive to lower prices, unless the discount is sufficiently large and there are enough other safeguards/inducements to persuade them to switch. In relation to switching, we note that given the importance of reputation of suppliers, customers are more likely to switch to a supplier they have contracted with and had a good experience with previously.
- 7.12 A barrier that is related to security of supply concerns the need for suppliers to hold significant stocks of raw material and finished product in strategic locations, during periods of peak demand. Given customers' unwillingness, in the UK at least, to share the risk (see paragraphs 6.15 to 6.17) and the cost of

holding such stocks, ADF suppliers tie up significant amounts of stock working capital. Clariant told us that typically it would hold about [redacted] to [redacted]% of annual sales in stock to ensure security of supply.<sup>91</sup> If the winter was milder than expected, a supplier could be faced with negative cash flows. This is because the supplier would receive lower cash-inflows than those projected, but it would have to pay its suppliers (particularly for MPG).<sup>92</sup> This would require the supplier to hold a cash reserve and/or seek a cash injection via equity and/or debt finance. The supplier would face a financing cost in either case, and this could represent a barrier.

7.13 Managing peak demand not only entails holding large stocks of finished goods but also entails tightly managing manufacturing lead times in order to produce the required quantities of ADF at short notice. This leads to a number of costs:

- (a) Raw material stocks: although there are a number of suppliers of MPG, there has been at least one occasion in recent years (in 2010/11) when MPG suppliers failed to supply the raw material during the period of peak demand, thus leading to ADF supply shortages. Having stored strategic stocks of raw material enabled Kilfrost to continue to produce ADF in the UK. As ADF is only one use among others for MPG, there is no incentive on MPG suppliers to prioritise ADF manufacturers as they account for a small proportion of MPG total purchases.
- (b) Having adequate 'manufacturing capacity' to quickly produce ADF.
- (c) Having a reliable in-house or third party logistics partner, who is able to deliver during adverse weather conditions.

#### *Economies of scale and scope*

7.14 The evidence we have analysed indicates that the main source of economies of scale in the manufacture of ADF is the purchase of MPG. This is the largest cost of production and we have seen evidence that larger users of MPG obtain better prices (see Appendix D).

7.15 We did not identify any significant economies of scope, as the production and supply of ADF tend to use a dedicated infrastructure, whether in terms of production lines or logistics for practical reasons.

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<sup>91</sup> Clariant told us that [redacted].

<sup>92</sup> These would usually be unsecured trade creditors that cannot initiate an insolvency process. However, non-payment over long periods could damage relationships with these trade creditors. If key suppliers stop supplying MPG, then it could also create an adverse situation with regards to security of supply.

### *Technical barriers*

- 7.16 The evidence shows that technical barriers are likely to be high for suppliers that do not currently produce ADF (and choose not to manufacture under licence conditions) and that they would be higher for ADF Type II and Type IV than for ADF Type I. This is because developing formulae is a costly and time consuming process, particularly for ADF Types II and IV, which are technically more challenging than ADF Type I (see Appendix E, paragraphs 89 to 96). There is also limited ability to leverage expertise across other products, such as runway or rail de-icing fluids and the certification process is unique to each type of ADF.
- 7.17 Technical barriers may not however be high for a supplier that enters the ADF market using licence arrangements with existing manufacturers of ADF. This is because such a supplier would not need to develop its own formula by engaging in research and development. It would just need to manufacture a tried and tested formula. However, we note that the choice of potential licensors may be limited in the EEA (as [✂]).

### *Legal barriers*

- 7.18 The key legal barrier relates to the costs of seeking the certifications. The process itself is not lengthy or costly, but it adds to the overall cost and timeline to develop and commercialise ADF products. There are also certification requirements for blenders which, when combined with other required investments, may discourage companies from establishing themselves as blenders.
- 7.19 However, such accreditations are not UK specific and non-UK suppliers with existing approved products have the ability to start supplying UK customers with minimal legal or regulatory requirements.

### *Provisional conclusions on barriers to entry and expansion*

- 7.20 We provisionally conclude that the most significant barriers to entry or expansion faced by an existing supplier of ADF in the EEA arise from:
- (a) the need to demonstrate to key customers their ability to deliver large volumes reliably under any weather condition, which is achieved through a known track record of delivery and concrete evidence of production and logistical resilience; combined with
  - (b) the risks and costs associated with putting in place an appropriate infrastructure before winning sizeable contracts; and

- (c) the risks and costs of holding large stocks of product on consignment in various locations ahead of a winter, without certainty that the volumes will be required.

As a result, achieving growth beyond some small contracts with less demanding customers is challenging for less established suppliers.

- 7.21 We also provisionally conclude that obtaining supplies of MPG is not a barrier to entry per se, but there are economies of scale in the procurement of MPG that impede the ability of smaller suppliers to offer competitive prices.
- 7.22 For suppliers that do not currently have operations in the EEA, barriers to entry and expansion also include the development and certification costs for ADF products and the set-up of local manufacturing facilities, possibly under toll manufacturing arrangements. Such barriers are significant.

*Assessment of likelihood, timeliness and sufficiency of entry and expansion*

- 7.23 Having assessed the nature and extent of barriers to entry and expansion, we now examine the likelihood of entry and/or expansion. Clariant submitted that the most likely entrants into the UK would be existing ADF suppliers that operated elsewhere in Europe and/or existing suppliers of adjacent products such as MPG or runway de-icers and non-European ADF suppliers.<sup>93</sup> We consider each of these in turn.

*Current ADF suppliers in the EEA*

- 7.24 As stated in paragraph 7.4 above, Clariant put forward that Proviron would be the most likely supplier to expand in the UK to act as a potential competitive constraint.
- 7.25 Proviron told us that its Belgian facility was large enough to serve [a major part] of the European ADF market. From a logistics and cost point of view, its short-term strategy was to expand in Belgium and areas as close as possible to Belgium – such as the Netherlands, northern France, the UK, Luxembourg and Germany. It had recently picked up a lot of new business (in [REDACTED]). Although it did not have many customers in the UK, in the three years since it started supplying the UK market, potential customers had come to know about Proviron and its products and its target was to grow its share of supply

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<sup>93</sup> [Clariant initial submission](#), paragraph 6.1.

in the UK [REDACTED], but this would be dependent on the number of customers it acquired and the weather).<sup>94</sup>

- 7.26 Proviron though has not managed to gain more than [REDACTED]% of the UK market since it entered in October 2013 and based on the evidence we have received, we believe that its current share is lower at around [REDACTED]%. To date Proviron has only managed to [REDACTED] and we have heard from [REDACTED]. In the UK, three customer contracts account for approximately [REDACTED]% of ADF demand: two of which [REDACTED]; with regard to the third one [REDACTED] our evidence shows that demonstration of a strong supply chain was paramount to the decision to switch to Clariant. [REDACTED] told us that it did not envisage [REDACTED].
- 7.27 We noted in paragraph 6.69 above that the scores that UK ADF customers gave to Proviron were [REDACTED] with customers having reported concerns [REDACTED]. In addition, one UK customer [REDACTED] raised concerns about [REDACTED].
- 7.28 Taken together, the facts set out in paragraphs 7.25 to 7.27 indicate that Proviron may be limited in its ability to win sizeable contracts and expand significantly in the UK.
- 7.29 ABAX is a large supplier in the EEA. However its share of supply is driven primarily by sales to customers in [REDACTED]. Kilfrost told us that ABAX had never actively marketed its products in the UK, and this was confirmed by Esseco and customers. Outside these [REDACTED] areas, it has a limited presence, [REDACTED]. Most importantly, ABAX [REDACTED]. As noted at Figure 3, ABAX scored [REDACTED] and lost a tender with one UK customer at least partly because of concerns about [REDACTED]. These factors may explain why ABAX has failed to gain new contracts in the UK in recent years. ABAX itself told us that as a result of the Merger, it would [REDACTED].
- 7.30 LNT Solutions and ADDCON currently only supply Type I ADF, which restricts the number of customers that can buy from them, but we note that they are currently developing Type II and IV ADF. They are relatively new players in the EEA and are not generally known by UK customers. Most importantly, they lack a track record for effective delivery in difficult weather conditions within the EEA and lack the reputation for security of supply or established supply chains that are necessary to win large customers. LNT Solutions told us that entering the UK ADF market was not [REDACTED] unless [REDACTED].

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<sup>94</sup> [Proviron hearing summary, paragraph 13.](#)

- 7.31 Furthermore, we found no evidence that smaller and more geographically remote players such as Boryszew in Poland were planning to expand into the UK.

*Potential de-novo entry by non-EEA ADF suppliers or suppliers from related sectors*

- 7.32 We considered the likelihood of de novo entry in the UK and EEA. We set out in paragraph 7.22 that barriers to such entry are higher than for entry or expansion by existing suppliers (high switching costs and the importance of reputation and an extensive logistics infrastructure).
- 7.33 Clariant identified two companies as the most likely de-novo entrants: AllClear Systems and Integrated Deicing Services (IDS) (both US companies). However it was not able to provide any evidence to support that such entry was likely to occur. In fact it relayed to us a conversation it had with IDS, a company it considered might enter through backward integration into the supply of ADF from its existing role as a de-icing services company, in which IDS said that it did not intend to backward integrate. IDS confirmed to us that it focused on the USA and it had no plan to supply ADF in the UK or the EEA and did not foresee any such activities in the next three to five years.
- 7.34 AllClear Systems, having expressed the willingness to enter the UK in principle, told us that the increasing dominance of Clariant in terms of share of supply and, by extension, extremely aggressive strategic pricing may hamper its ability to offer a viable alternative to the EEA/Scandinavian area as a whole. It stated it would need to consider these factors, as well as the ability to competitively access glycol supplies in the area before committing to the EEA region.

*Provisional conclusion on likelihood of entry or expansion in the UK*

- 7.35 We provisionally conclude that none of the existing suppliers in the EEA (Proviron, ABAX, LNT Solutions, ADDCON) are considered credible competitors to the Parties by customers in the UK. Each of them has either no or a substantially smaller footprint in the UK than Kilfrost and Clariant. In addition, they have no or limited logistics and reputation in the UK. We therefore provisionally conclude that entry or expansion by any of these existing suppliers would be unlikely to occur in sufficient scale or within a timescale so as to mitigate the SLC we have provisionally found.
- 7.36 We provisionally found that neither of the companies identified by Clariant as likely new entrants (AllClear Systems, IDS) were planning to enter the UK and/or EEA ADF market in the relevant timescale. We also found that barriers

to entry for suppliers with no existing operation in the EEA were higher than for entry or expansion by existing suppliers, and therefore, in our view, the possibility of such entry was remote in the relevant timescale. We therefore provisionally conclude that such de novo entry is unlikely to occur so as to mitigate the SLC we have provisionally found.

### **Buyer power**

- 7.37 Our guidance states that buyer power can be generated by different factors.<sup>95</sup> An individual customer's negotiating position will be stronger if it can easily switch its demand away from the supplier, or where it can otherwise constrain the behaviour of the supplier. Typically the ability to switch away from a supplier will be stronger if there are several alternative suppliers to which the customer can credibly switch, or the customer has the ability to sponsor new entry or enter the supplier's market itself by vertical integration. Even where the market is characterised by customers who are larger than the suppliers, it does not necessarily follow that there will be countervailing buyer power and the merger may reduce the customer's ability to switch or sponsor entry and, if the reduction adversely affects the negotiating position of a customer significantly, that customer's buyer power will not be sufficient to be countervailing.
- 7.38 First, the evidence we have seen on the level of competitive interactions between Clariant and Kilfrost and extent to which customers play them off against each other to secure better prices [REDACTED] rather than against other competitors indicates that the bargaining power of customers, particularly of those with requirements for large volumes and tight delivery timescales, is likely to be significantly diminished as a result of the Merger.
- 7.39 Although in principle sponsored entry by a large customer may be possible, we could not satisfy ourselves that it was a likely and timely outcome in the ADF market:
- (a) First, to the extent that [REDACTED] can be viewed as sponsored entry, it shows that such a strategy is risky for the customer and is likely to be implemented gradually. As noted elsewhere, we are not persuaded that [REDACTED] will result in successful expansion for Proviron.
  - (b) Second, [REDACTED] told us that when it needed to purchase a product that had a limited supply/choice of supplier in an area with high barriers to entry then the procurement team would often seek to support a new entrant by

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<sup>95</sup> [Merger Assessment Guidelines](#), paragraphs 5.9.3. & 5.9.4.

splitting its volume requirements between two suppliers – an incumbent and a new entrant. This would give a new entrant the opportunity to develop scale, credibility and its understanding of [redacted] needs. However, in the case of ADF it was not possible for [redacted] to split its ADF Type IV volumes (or indeed split its ADF Type I volumes) between two suppliers because it was not possible to mix ADF from two different suppliers. [redacted] did not have the infrastructure at [redacted]<sup>96</sup> to use two different ADF Type IV products [redacted]. [redacted] would also not consider entering into a supply contract [redacted] with a new and untested supplier because this would not be sufficiently robust from an operational perspective.

- (c) Third, [redacted] another airline with a significant ADF volume requirement, expressed doubt about the ability of one customer to provide enough volume to a potential supplier to support its entry. In its view, several large customers would need to join forces to provide the scale necessary for a new entrant.

7.40 We therefore provisionally concluded that it was unlikely that the exercise of buyer power by UK customers could be sufficient to countervail the effect of the Merger.

### **Efficiencies**

7.41 As explained in our guidance, efficiencies can be taken into account in two ways: efficiencies may enhance rivalry, with the result that the merger does not give rise to an SLC or they may result in the form of relevant customer benefits.<sup>97</sup>

7.42 Clariant told us that the Merger would lead to material benefits to customers, which it articulated in the following way:

- (a) Security of supply.
- (b) An improved level of service: the Merger would not lead to a degradation in service levels in the UK.
- (c) A [redacted];
- (d) A merged entity that was able to withstand the variable seasonal demand [redacted].<sup>98</sup>

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<sup>96</sup> It should be noted that [redacted] only buys its own ADF at [redacted].

<sup>97</sup> [Merger Assessment Guidelines](#), paragraphs 5.7.2 & 5.7.3.

<sup>98</sup> [Clariant initial submission](#), paragraphs 11.3, 11.7–11.12 and paragraphs 11.13–11.15.

- 7.43 In addition, as stated in paragraph 3.13, Clariant identified synergies amounting to [X] per year [X].
- 7.44 The Act (section 35(3)) states that relevant customer benefits are taken into account in deciding whether and what measures to take, once a possible SLC has been identified. The question at this stage therefore is whether any efficiency benefits put forward by Clariant could be rivalry enhancing. Given the Merger brings together the largest and second largest suppliers both in the UK and the EEA, we consider that there is no basis on which efficiency savings could be rivalry enhancing.

## **8. Provisional conclusions**

- 8.1 The creation of the relevant merger situation which we identified in Section 3 may be expected to result in an SLC in the market for the supply of ADF in the UK.
- 8.2 First, the Merger would occur in an already highly concentrated market and would result in a merged firm with a very large share of supply in both the UK and the EEA. Moreover, the evidence has shown that Clariant and Kilfrost are each other's closest competitors and customers consider alternative suppliers to be more distant. They also consider switching to be risky.
- 8.3 We expect that following the Merger, Clariant would have an incentive to increase prices and/or worsen non-price aspects of its offering (including security of supply).
- 8.4 We consider that there is a particular risk of price increases given that the price sensitivity of customers is relatively low.
- 8.5 We have also seen evidence of competition in relation to research and development and innovation, and we consider that the Merger would eliminate a competitive force in relation to incremental product innovation.
- 8.6 Finally, we consider that the Merger would reduce choice for customers due to the elimination of Kilfrost as a competitor and the gradual removal of its ADF products from the market.