COMPETITION COMMISSION

Kemira Growhow Oyj and Terra Industries Inc merger inquiry

A report on the anticipated joint venture between Kemira GrowHow Oyj and Terra Industries Inc

11 July 2007

Website: www.competition-commission.org.uk

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The Competition Commission has excluded from this published version of the 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 ✂.

KEMIRA GROWHOW OYJ AND TERRA INDUSTRIES INC MERGER INQUIRY

Final report

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Summary

The reference

1. On 26 January 2007, the Office of Fair Trading (OFT) referred an anticipated joint venture between Kemira GrowHow Oyj (Kemira) and Terra Industries Inc (Terra)[1] to the Competition Commission (CC) for investigation and report. The reference was made under section 33 of the Enterprise Act 2002 (the Act). We published our provisional findings on 4 May 2007. We are required to publish our final report within a period ending on 12 July 2007. Our terms of reference are shown in Appendix A.

The parties and the transaction

2. The anticipated joint venture (JV) would merge the greater part of the UK businesses of these two international companies, Terra and Kemira.[2] They are both fertilizer production businesses, but both also produce and sell chemical products.

The relevant markets

3. The parties overlap in the production and sale of:

   - ammonium nitrate (AN), which is used both as a fertilizer and for the manufacture of explosives;
   - ammonium nitrate sulphate (ANS), which is used as a fertilizer;
   - complex fertilizers, which are based on AN but also include phosphorus and/or potassium;
   - nitric acid, which is an intermediate product for the manufacture of AN, and which is also used by other chemicals businesses;
   - ammonia, which is an intermediate product for the manufacture of AN, and which is also used by other chemicals businesses to which it is supplied in two forms: anhydrous ammonia and aqueous ammonia; and
   - raw carbon dioxide (CO_2), which is a by-product of ammonia manufacture and some of which is sold on for a variety of end uses, such as the carbonation of soft drinks.

Industry background

4. Terra has facilities at Billingham and Severnside; Kemira has one at Ince. Whilst the parties are of broadly similar sizes in their fertilizer businesses, Terra has much larger revenues from chemicals, partly due to its business history. Terra occupies part of the former ICI site at Billingham with several important customers nearby.

5. Both the parties appear to have been under considerable financial pressure in recent years. Natural gas is their most important raw material and high natural gas prices in

[1]We refer to Terra and Kemira jointly as 'the parties'.
[2]There is a small part of Kemira's UK business, including a facility at Hull, that will not become part of the JV.

the UK in the winter of 2005/06, compared with other countries, apparently put them at a disadvantage to their competitors. Natural gas prices have since fallen.

Counterfactual

6. We considered what would have happened if the JV were not to proceed. We expected that in the absence of the JV the parties would continue as separate companies and would compete with each other, in each of the relevant markets, with levels of competition broadly similar to those in the recent past.

Markets for fertilizers and conclusions on substantial lessening of competition in each

7. We considered the market for AN fertilizers. We found that AN and ANS were substitutes. We found that urea-based fertilizers were substitutes for AN-based fertilizers for many (but by no means all) customers. AN, ANS, urea and a number of other AN fertilizers are known as straight N fertilizers.

8. We found that there were high levels of imports, from a variety of origins, and facilitated by effective distribution channels.

9. We examined the prices of AN, urea and natural gas. This evidence suggested that UK market prices were likely to be constrained by substitution, or the threat of substitution, of the parties' AN by imported AN and urea.

10. We considered whether the JV might be able to increase prices selectively to those customers that would not switch to imported AN or urea. We found that this was unlikely since these customers could source through distributors.

11. We did not expect that the JV would lead to a substantial lessening of competition (SLC) in the market for straight N fertilizers.

12. We considered the market for complex fertilizers—those that have more than one main nutrient, typically combining nitrogen (N), potassium (K) and/or phosphorus (P). Such fertilizers come in two forms: compound fertilizers, which combine the nutrients chemically, and blended fertilizers, which combine them by physical mixing.

13. Although some farmers have preferences for either blended or compound fertilizers, we found that they were substitutes and formed part of one compound fertilizers market. Imports appeared to form a fairly small part of this market; we examined the market on a UK basis whilst recognizing that it could be wider.

14. Terra has a very small share of the UK market for compound fertilizers. The JV would have only a slightly larger share than the current share of Kemira, and there would be other substantial competitors.

15. We did not expect that the JV would lead to an SLC in the market for compound fertilizers.

Market for ammonium nitrate for non-agricultural customers and conclusion on substantial lessening of competition

16. We considered the supply of AN to non-agricultural customers. Whilst use as a fertilizer is the most important function of AN, it does have other uses. The most significant of these, by far, is its use by explosives manufacturers.

17. The JV would merge the only two UK producers of AN; explosives manufacturers currently obtain almost all their supplies from these two producers. We considered the evidence and views put to us by both the customers and the producers. Explosives manufacturers, which have somewhat different requirements from agricultural customers, have not in the past had strong needs to seek alternative sources of supply, although they have investigated this to some degree.

18. We expect that if the customers were faced with significant price increases there would be stronger commercial incentives for both the customers and third parties (other producers and distributors) to develop alternative arrangements, and we therefore expect the likelihood of success to be greater than the customers have suggested.

19. In our view, each of the alternative sources is potentially viable, although we recognize that there are practical issues to be overcome. However, on balance, we consider that at least one of the alternatives would be both practically and economically viable, thereby constraining the JV's prices.

20. We therefore concluded that the JV would not be able to implement a selective increase in prices to non-agricultural customers and the JV may not be expected to result in an SLC in the supply of AN to non-agricultural customers.

Market for CO_2 and conclusion on substantial lessening of competition

21. We considered the market for CO_2. We found that the ammonia production process, as operated by the parties, was one of the most effective sources of CO_2, resulting in relatively low purification costs. As a result, the parties have a very high share of the market for the supply of CO_2 to distributors in the UK.

22. The parties told us that there were many other potential sources of CO_2, but we found that at present there were relatively few, and that to exploit each potential source would require significant capital investment. Whilst there was evidence of planned investment in bio-fuel plants (another possible source of suitable CO_2), most of these plans were at an early stage and it was far from clear that we could expect CO_2 liquefaction equipment to be installed in the foreseeable future. We considered that the JV was not likely to result in coordinated effects, but that it was likely to result in unilateral effects.

23. We therefore concluded that the JV may be expected to result in an SLC in the market for the supply of CO_2 to distributors in the UK as a result of unilateral effects.

Market for nitric acid and conclusion on substantial lessening of competition

24. We considered the market for nitric acid. We found that the parties competed significantly only in the supply of 58 to 60 per cent concentration nitric acid. As they are the only two UK suppliers and as transport costs rendered imports unattractive, the JV would be expected to have a monopoly in this market.

25. We therefore concluded that the JV may be expected to result in an SLC in the supply of 58 to 60 per cent nitric acid.

Market for aqueous ammonia and conclusion on substantial lessening of competition

26. We considered the market for aqueous ammonia. We found that the relevant market was UK wide, the threat of imports being an insufficient constraint on prices. We found that the JV would have a market share of over 75 per cent, and that the other two suppliers to this market were dependent on the parties.

27. We therefore concluded that the JV may be expected to result in an SLC in the market for the supply of aqueous ammonia to customers in the UK.

Market for anhydrous ammonia and conclusion on substantial lessening of competition

28. We considered the market for anhydrous ammonia. We found that the relevant market was UK wide, since importing was costly due to the chemical's hazardous nature. The parties are the only two suppliers, so the formation of the JV would create a monopoly supplier.

29. We therefore concluded that the JV may be expected to result in an SLC in the market for the supply of anhydrous ammonia to customers in the UK.

Conclusion

30. We concluded that the anticipated JV between Kemira and Terra constitutes a relevant merger situation which may be expected to result in SLCs in each of the markets for CO_2, nitric acid (of 58 to 60 per cent concentration), aqueous ammonia and anhydrous ammonia. These last three products are referred to below as 'the relevant process chemicals'.

Remedies

31. Our notice of possible remedies published on 4 May 2007 sought comments on one remedy to address the SLCs in the markets for the relevant process chemicals and another remedy to address the SLC in the CO_2 market.

32. We sought comments on a divestiture remedy consisting of Kemira's outloading facilities at Ince for the relevant process chemicals. The parties put forward their own divestiture package including provisions for a long-term lease on fixed assets at Ince, long-term supply agreements, transfer of customer and other contracts, transfer of information and key personnel and other provisions. We considered that in principle this remedy was viable and after assessing the market and potential purchasers believed that a suitable buyer would come forward. Although after divestiture links were bound to remain between the purchaser and the JV, we sought to mitigate risks by, among other things, requiring suitable undertakings that the supply agreement and lease would not be modified without OFT approval, and requiring there to be a commitment from the JV to the purchaser not to close the plant permanently for a specific period or that, if it did, a commitment to supply the relevant process chemicals from Billingham to the divested business.

33. We considered whether price control mechanisms would be effective, as the parties thought they would be, in addressing the expected SLCs in the markets for anhydrous ammonia, aqueous ammonia and nitric acid of 58 to 60 per cent concentration. We agreed that with further work our concerns about the proposals

might be to an extent addressed but doing so would increase the complexity of the remedies. In addition, their effectiveness was bound to be eroded over time. We therefore concluded that price controls would not be an effective remedy.

34. As regards the SLC we found in relation to the supply of CO_2 to distributors within the UK, there appeared to be two effective remedies (other than prohibition): modifying the existing contract between Kemira and Air Liquide at Ince, or the sale of one of Terra's liquefaction facilities.

35. We decided that obtaining suitably detailed commitments in relation to the contract between Kemira and Air Liquide at Ince would impose the least cost and would be the least restrictive and would cost less than a divestment of one of Terra's liquefaction facilities.

36. We concluded therefore that a remedy centred on the contract between Air Liquide and Kemira at Ince would be more reasonable and practicable

Prohibition

37. Because it would preserve the market structure and competition prevailing pre-JV, prohibition would be an effective remedy. It would, however, be more restrictive than the equally effective package of remedies comprising the divestment of outloading facilities at Ince and behavioural undertakings relating to the contract between Kemira and Air Liquide.

Findings

1. Introduction

1.1 On 26 January 2007, the OFT referred an anticipated JV between Kemira and Terra to the CC for investigation and report. The reference was made under section 33 of the Act. Our terms of reference are shown in Appendix A. We published our provisional findings on 10 May 2007 and invited comments; no comments were received. We consulted on remedies around the same time and received comments on these which are discussed in the remedies section of this report. This is our final report which we are required to publish within a period ending on 12 July 2007.

1.2 The proposed JV would merge the greater part of the UK businesses of these two international companies.[3] These are both fertilizer production businesses, but both also sell chemical products which are outputs from their processes.

1.3 The parties overlap in the production and sale of:

- AN, which is used both as a fertilizer and for the manufacture of explosives;
- ANS, which is used as a fertilizer;
- complex fertilizers, which are based on AN but also include phosphorus and potassium;
- nitric acid, which is an intermediate product for the manufacture of AN, and which is also used by other chemicals businesses;
- ammonia, which is an intermediate product for the manufacture of AN, and which is also used by other chemicals businesses to which it is supplied in two forms: anhydrous ammonia and aqueous ammonia; and
- CO_2, which is a by-product of ammonia manufacture and some of which is sold on for a variety of end-uses, such as the carbonation of soft drinks.

Structure of this report

1.4 In this report we first set out some background information on the industry, the parties to the JV and the proposed transaction. We then consider whether the transaction falls within the CC's jurisdiction, and what we expect would have happened in the absence of the JV (referred to as the counterfactual).

1.5 We go on to consider the various markets in the following sequence: straight N fertilizers,[4] complex fertilizers, AN for explosives manufacture, CO_2, nitric acid, aqueous ammonia and anhydrous ammonia. For each of the markets, we set out some background material, then consider the appropriate market definition, the competition in the market and the effects of the JV.

1.6 We conclude with a statement of our findings.

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[3]There is a small part of Kemira's UK business that will not become part of the joint venture.
[4]A 'straight fertiliser' is the term used in the industry for fertilizers with one principal ingredient.

2. Industry background

Introduction

2.1 The main nutrients required by plants are carbon, hydrogen, oxygen, nitrogen, phosphorus and potassium. Of those, the elements which are most likely to be depleted in the soil are nitrogen, phosphorus and potassium, collectively known as primary nutrients. The supply of primary nutrients must therefore be supplemented by fertilizers, both to meet the requirements of crops during periods of plant growth and to replenish soil reserves after the crop has been harvested. Primary nutrients are either applied separately in the form of 'straight' fertilizers or as various combinations of nitrate compounds, phosphate and potash.[5] Combinations of at least two primary nutrients are known as complex fertilizers,[6] of which there are two types:

- Compound fertilizers: the nutrients are combined by chemical reaction. Each granule that results contains the required mixture of nutrients.

- Blended fertilizers: these are obtained by the dry mixing of several materials. No chemical reaction is involved. Each granule contains one type of primary nutrient.

The majority of complex fertilizers applied in the EU are compound fertilizers.

2.2 There are several types of straight N fertilizers (ie fertilizers whose purpose is to provide nitrogen), the most common types being AN, urea, calcium ammonium nitrate (CAN), urea ammonium nitrate (UAN), ANS and ammonium sulphate (AS).

2.3 Most fertilizers are applied in solid form and are produced either as granules or prills[7] and delivered in bulk or in bags. UAN is produced only as a solution. Solid urea is available in the UK both as prills or granules.

2.4 The production of straight N fertilizers started in the UK in Billingham in 1924 and production of complex fertilizers started on the same site in 1930. Over the years the industry has experienced periods of expansion, market entry, overcapacity and rationalization. By 1990, supply of straight N fertilizers was split between Kemira, ICI,[8] Hydro Fertilizers (the UK subsidiary of Norsk Hydro,[9] subsequently spun off as Yara[10]) and imports. A proposed acquisition of ICI's UK fertilizer business by Kemira was blocked following a report published by the Monopolies and Mergers Commission in January 1991. Against a backdrop of declining demand, Hydro Fertilizers closed a plant at Immingham in 2000, but continued to supply the UK market with products it bought from Terra UK (which had in 1997 acquired ICI's fertilizer business) and imports, mainly from its Dutch and Norwegian operations.

2.5 Today, the parties are the only remaining producers of straight N fertilizers in the UK. Compound fertilizers are produced in the UK only by Kemira, whilst a number of companies, collectively referred to as blenders, make blended fertilizers from straight fertilizers they purchase from various sources. The parties supply the following fertilizers from their facilities:

- Terra: AN, ANS and a limited amount of blended fertilizers; and

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[5]Nutrients are applied as chemical compounds.
[6]Complex fertilizers are also known as NPK or multi-nutrient fertilizers.
[7]A particle formed by forcing molten fertilizer through holes in a metal disc or a spinning bucket and allowing it to fall as droplets in a tower. Prills tend to be more spherical and slightly smaller than granules.
[8]Imperial Chemical Industries PLC.
[9]Norsk Hydro ASA.
[10]Yara International ASA.

- Kemira: AN, ANS, compound fertilizers and limited volumes of CAN.

The production of fertilizers

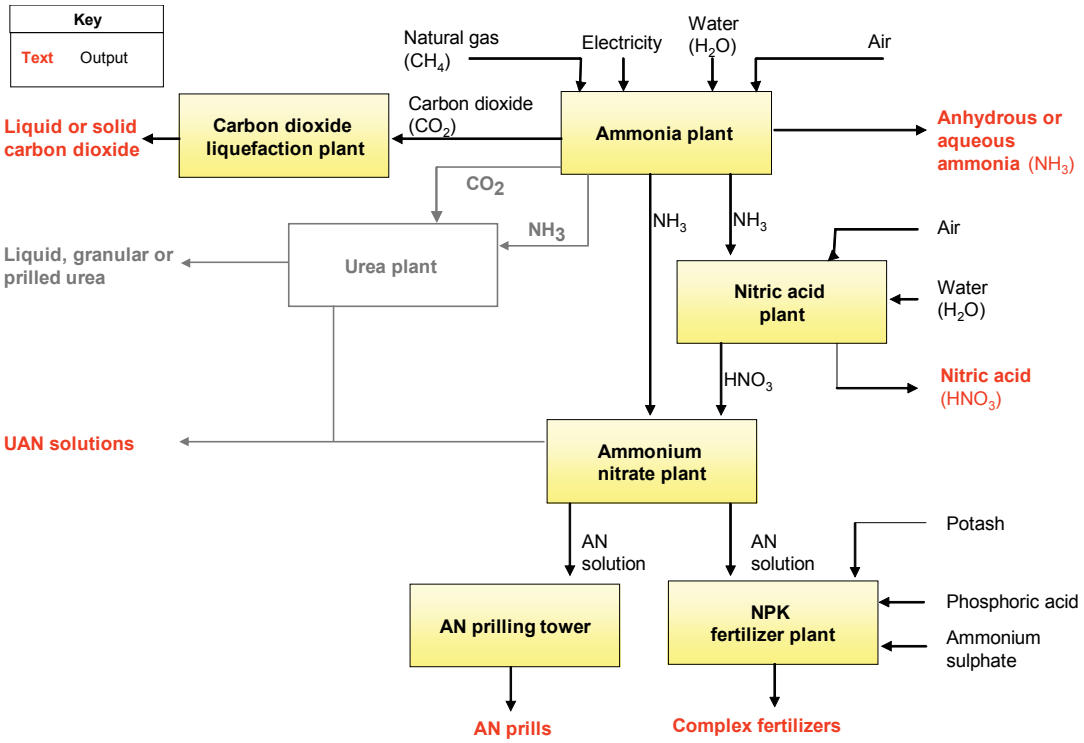
Overview of the process

2.6 The key inputs of straight N fertilizer production are: natural gas, electricity, demineralized water and nitrogen from the air.

2.7 Figure 1 shows the key stages in the fertilizer manufacturing process, of which there are four distinct phases: ammonia manufacture, production of nitric acid, production of AN solution, and production of either AN prills or complex fertilizers.

FIGURE 1

Key stages and intermediate products involved in the production of fertilizers



Note: Activities represented in light grey are not carried out in the UK. Neither Kemira nor Terra produces urea in the UK.
Source: CC.

2.8 Two key intermediate products, ammonia (in anhydrous or aqueous form) and nitric acid, having been diluted or concentrated if necessary, may be sold to third parties. In addition, the process of ammonia manufacture releases large volumes of CO_2 which may be vented to the atmosphere or recovered and sold following purification and liquefaction.

2.9 Natural gas is the most significant cost for the parties. Depending on current prices of process inputs, the cost of natural gas typically represents 70 to 80 per cent of the variable cost of AN fertilizer. The amount of natural gas needed to make the various products involved in fertilizer production is shown in Table 1.

TABLE 1 **Quantities of natural gas required to make AN fertilizers and related products***

	Quantity of natural gas therms per tonne of output	*Origin/purpose of gas*	*Gas cost as proportion of total variable costs if the price of gas is 30p/therm (%)*	*Gas cost as proportion of total variable costs if the price of gas is 50p/therm (%)*
Anhydrous ammonia	✂	As feedstock and fuel	✂	
58% nitric acid		In ammonia and as fuel		
AN solution		In ammonia and nitric acid		
AN prill		In ammonia and nitric acid		

Source: Kemira.

*The two gas cost columns illustrate respectively the costs at March 2007 and the costs when gas prices were at their peak in 2006.

2.10 AN is easily stored in bags and needs to be stored as demand is highly seasonal whereas production takes place year round. Although nitric acid and ammonia can be stored in their respective storage tanks, storage typically ranges from a few hours to a few days, reflecting the fact that these products are manufactured as required to respond to the demands of third parties.

2.11 The manufacturing process is described in more detail in Appendix B.

The parties' plants in the UK

2.12 In 1997 Terra purchased two manufacturing facilities from ICI. They were located in Billingham, in the Teesside chemical area, and on Severnside, and had been built in several phases in the 1970s and 1980s. Terra's Billingham facility had at one time been part of a large, integrated ICI chemical site, but some sections had been sold to other companies and others closed. Terra's Billingham facility is now geographically split into three separate areas: the main site contains the ammonia plant, three nitric acid plants and a separate carbon dioxide plant; the Portrack site about 2 miles away contains an AN fertilizer plant; and the north Tees site about 5 miles away has ammonia storage which Terra leases from a third party, and an import/export facility that it uses under an agreement with a third-party operator. The Severnside facility consists of two ammonia plants, two nitric acid plants and an AN plant.

2.13 Terra's Billingham facility is connected by pipeline to other businesses. These were once other units in ICI's integrated plant, but were sold by ICI. Terra uses these pipelines to deliver ammonia to customers under long-term supply arrangements. It also provides various utilities to other businesses on the former ICI site.

2.14 Table 2 shows the production volumes and capacities of Terra's production facilities. The vast majority of the anhydrous ammonia and nitric acid produced at its Severnside plant is used in-house for the production of fertilizers.

TABLE 2 **Capacity and production of key products at Terra's facilities, 2006**

'000 tonnes a year

	Billingham capacity	*Severnside capacity*	*Total production*	*External sales*
Ammonia				
Nitric acid				
CO_2		✂		
AN				

Source: Terra.

2.15 Kemira operates an ammonia production plant, at Ince (Cheshire), which was built in 1969. Most of its output is used to make AN. The Ince facility also has the capacity to produce compound fertilizer granules using purchased phosphate and potash fertilizers that are combined with nitrogen. There are three nitric acid plants on the site, all of which normally produce 58 per cent nitric acid. 60 per cent nitric acid is also produced in one of the plants for sale to third parties. Table 3 shows the production volumes and capacities of Kemira's Ince facility.[11]

TABLE 3 **Capacity and production of key products at Kemira's facilities, 2006**

'000 tonnes a year

	Ince capacity	*Total production*	*External sales*
Ammonia			
Nitric acid			
CO_2		✂	
AN			

Source: Kemira.

*Includes [✂] tonnes of dry ice.

2.16 Kemira's and Terra's facilities are the only integrated fertilizer plants in the UK. The parties told us that establishing a fertilizer plant of similar capacity to that at Ince today would require a very large investment, estimated by Kemira to be in excess of £500 million.

Capacity issues

2.17 The parties told us that their UK facilities must operate at high levels of capacity utilization and that the target is to operate continuously throughout the year, with stoppages only for planned maintenance. Fixed costs, including the costs of building and maintaining the facilities, are high, so capacity utilization is very important. In addition, Kemira stated that the cost of any shutdown was very high, as the process of restarting the plant, which took three to five days, wasted a considerable amount of natural gas.

2.18 Terra told us that reliability and security of supply of anhydrous ammonia and nitric acid were crucial both to its pipeline customers and its distributor customers. Consequently these customers took priority and any swings in demand were accom-

[11]Kemira also has a plant at Kingston upon Hull which is currently operated by BP on Kemira's behalf. It supplies product to other Kemira operations in Continental Europe and will not form part of the joint venture.

modated by variation in fertilizer production or import/export of anhydrous ammonia by ship.

2.19 Ammonia plants and nitric acid plants are taken offline for scheduled major maintenance on a periodic basis. In addition, unplanned shutdowns sometimes occur. Terra told us that recently there had been two major unscheduled cessations of the production of ammonia at the Billingham facility. There was a shutdown from December 2005 to February 2006 due to high natural gas prices[12] and a complete outage in June and July 2006 due to a fire. These outages were managed by the importation of ammonia by ship to maintain ammonia solution and nitric acid production, and there was no interruption to process chemical supplies except liquid CO_2, the production of which relies on Terra's ammonia plants. At the Severnside facility there was an unscheduled outage from February 2006 to March 2006, again due to high natural gas prices. Ammonia cannot be imported into Severnside, so it could not be supplied from Severnside during that time.

2.20 Kemira told us that it closed its ammonia plant at Ince during the winter of 2005/06 for the implementation of a major energy improvement project and routine maintenance. Because of high natural gas prices, Kemira decided not to restart ammonia production at Ince for a further three months after completion of the maintenance work. As a result, 2006 production volumes were less than the output of the Ince plant in recent years. Ince purchased anhydrous ammonia and 60 per cent nitric acid from other sources (including Terra), in order to continue fertilizer production. Ammonia was delivered to the site via its jetty facility on the nearby Manchester Canal; this enabled Ince to continue to operate at 80 to 90 per cent utilization when the ammonia plant was shut down.

3. Legislative framework and industry codes of practice

Product specification

3.1 The EC Regulation 2003/2003 defines the composition and definition of all fertilizers which have been approved as EC designated fertilizers. All EC designated fertilizers can be traded freely within the EU. Every importer and manufacturer must ensure that any fertilizer intended for sale in the EU complies with this regulation. AN fertilizers of high nitrogen content (ie containing more than 28 per cent by mass of nitrogen in relation to AN) must undergo checking, analysis and testing.

3.2 Fertilizers for sale in the UK do not have to be registered. The Fertiliser Regulations 1991 as amended[13] specify the labelling and packaging of the product and place a responsibility on the manufacturer to declare the nutrient content of the product. They also specify in Schedule 1 the non-EC-designated fertilizers approved for use in Great Britain.[14]

Safety

3.3 AN is an explosive chemical compound; its handling, transport and storage are subject to several UK regulations, including: The Dangerous Substances (Notification and Marking of Sites) Regulations 1990, The Notification of Installations Handling Hazardous Substances Regulations 1982, The Control of Major Accident Hazards

[12]The cost of production of ammonia (due to high natural gas costs) exceeded the wholesale price of imported ammonia.
[13]The Fertilisers (Amendment) Regulations 1995—Statutory Instrument 1995/16; The Fertilisers (Amendment) Regulations 1997—Statutory Instrument 1997/1543; The Fertilisers (Amendment) Regulations 1998—Statutory Instrument 1998/2024.
[14]Source: Department for Environment, Food and Rural Affairs.

Regulations 1999 (COMAH), The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004 and The Ammonium Nitrate Materials (High Nitrogen Content) Safety Regulations 2003.

3.4 Under The Ammonium Nitrate Materials (High Nitrogen Content) Safety Regulations 2003 (hereafter referred to as the AN Safety Regulations), AN in solid form, where its nitrogen content is more than 28 per cent of its weight, needs to be subject to a detonation resistance test (DRT), carried out at an accredited laboratory. This applies equally to material manufactured in the UK, imports from the EU and imports from outside the EU. Under these Regulations, when the delivery point is not the final user (eg farmer), suppliers of relevant AN must provide their customers with a uniquely numbered copy of the DRT certificate. Suppliers of AN are required to maintain an audit trail for the product from manufacture to final user. Those manufacturing, supplying or keeping AN for use other than a fertilizer may apply to the Health and Safety Executive (HSE) for exemption from carrying out a DRT, although the requirements for record keeping still apply.

3.5 In addition to the above regulations, under a voluntary scheme launched by the Agricultural Industries Confederation (AIC), the Fertiliser Industry Assurance Scheme (FIAS) has recently developed a number of codes of practice dealing with product traceability and security in the fertilizer supply chain. The scheme was initiated by the fertilizer industry and encouraged by the Government. Its stated aims are to give regulators confidence in the product stewardship exercised by the fertilizer industry and to trace supplies of fertilizer to end-customers in order to prevent non-legitimate users having access to AN-based fertilizers.

3.6 Within the FIAS, the Code of Practice for the Transfer and Traceability of Fertiliser Classified as Dangerous Goods places responsibility on the producer, importer and merchant for distribution and delivery of AN fertilizer to the farmer. It requires that these entities sell the product only to a known, bona fide, customer and that sales of AN-based fertilizer are always made to account-holding customers. Agricultural merchants must keep a record of all deliveries, including the consignee's name, address and quantity purchased, and make this available, on request, to the relevant authorities through the producer or first importer. To date, 17 companies have been certified under the scheme, whilst 90 applications are currently being processed.

Anti-dumping

3.7 Imports of AN fertilizers from Russia and the Ukraine into the EC are subject to anti-dumping measures: anti-dumping measures against Russia consist of a duty of €47.07/tonne, on top of a 6.5 per cent ad valorem regular import duty on AN products.[15] Anti-dumping measures against the Ukraine consist of a duty of €33.25/ tonne, on top of the 6.5 per cent ad valorem import duty on AN products.[16]

3.8 Imports of UAN solution from Algeria, Belarus, Russia and the Ukraine are also subject to anti-dumping duties ranging from €6.88/tonne (Algeria) to €26.17/tonne (Ukraine).[17]

3.9 Under Council Regulation (EC) No 477/95, imports of urea from Russia are subject to the following anti-dumping measures: the amount of duty imposed is the difference between the €115/tonne and the net, free-at-Community frontier price, before

[15]Regulation (EC) No 658/2002.
[16]Regulation (EC) No 132/2001.
[17]Council Regulation (EC) No 1995/2000.

customs clearance, if this price is lower. Imports of urea from Belarus, Croatia, Libya and the Ukraine are also subject to anti-dumping duties ranging from €6.18/tonne to €21.43/tonne.

3.10 On 25 January 2006, the European Commission opened a review to ascertain whether the Ukraine would resume the dumping of products in the EU market if the duties were removed (a 'sunset review'). The Council decided to extend the duties for two years from 24 April 2007.[18]

3.11 On 17 January 2007, the European Fertilizers Manufacturers Association lodged a request with the European Commission for a sunset review of the anti-dumping duties imposed on imports from Russia, arguing for the continuation of the current duty beyond 19 April 2007. The Commission announced on 14 April 2007[19] that it was initiating an expiry review, to be completed within 15 months, which will either recommend that the anti-dumping duties should be extended for a further five years (ie until 2013) or for a lesser period, or should be repealed. The duties remain in force until the review is carried out.

4. The companies

Kemira

4.1 Kemira was a division (Kemira Agro) of Kemira Oy until October 2004 when it was demerged. Kemira now has a separate listing from its former parent company on the Helsinki stock exchange.

4.2 There are four group companies in the UK and Republic of Ireland. An intermediate holding company, Kemira GrowHow Holdings Ltd, has one direct subsidiary, Kemira GrowHow UK Ltd, which has two subsidiaries, Kemira GrowHow Ltd and Kemira GrowHow Ireland Ltd. Kemira GrowHow UK Ltd operates the main plant at Ince in Cheshire.

UK operations

4.3 Table 4 provides a summary of the results of Kemira GrowHow Holdings Ltd, the UK and Ireland holding company.

TABLE 4 **Kemira GrowHow Holdings Ltd: summary of financial performance**

£ million

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006**
Turnover	166.5	153.8	148.9	182.8	178.0	171.3	✂
Operating profit	3.5	4.4	–1.7	7.3	5.4	–0.2	
Operating margin (%)	2.1	2.9	–1.1	4.0	3.0	–0.1	
Fixed assets (net)	60.2	52.9	50.2	44.7	41.9	56.8	
Employee numbers	464	464	461	454	453	442	

Source: ICC Plum database from Kemira GrowHow Holdings Ltd statutory accounts.

*From statutory accounts.

4.4 The figures in Table 4 include those of Kemira GrowHow Ltd, which owns an ammonia plant at Kingston upon Hull, which is operated on Kemira's behalf by BP

[18]Regulation (EC) 442/2007.
[19]Notice 2007/C81/02.

Chemicals Ltd; this business had sales in 2006 of £[✂] million, all to Kemira group companies outside the UK. Kemira GrowHow Ltd will not be included in the proposed JV. The figures in the table also include the results in the Republic of Ireland of Kemira GrowHow Ireland Ltd, with sales of about £[✂] million in 2006.[20] Deducting the sales of these two companies from Kemira GrowHow Holdings Ltd's turnover in 2006 of £[✂] million leaves sales for the UK fertilizer and process chemical businesses that are to be included in the JV of about £[✂] million. These businesses accounted for about [✂] per cent of Kemira's worldwide sales of about £[✂] million in 2006.

4.5 Table 4 shows that the turnover of Kemira GrowHow Holdings Ltd fell by almost [✂] per cent between 2005 and 2006, to £[✂] million, and that in 2006 it moved to an operating loss of about £[✂] million from a near break-even position in 2005. Kemira GrowHow Oyj reported a 7.4 per cent fall in worldwide sales to £795.4 million in 2006 and a reduction in operating profit from £30.9 million to £7.6 million.[21] When presenting its results for 2006,[22] Kemira said that it expected a higher group operating profit in 2007. Fertilizer demand was expected to grow, fertilizer prices were expected to remain at a high level, and the price of natural gas was expected to be lower than in 2006. Kemira said that high natural gas prices in the UK in comparison with mainland Europe in the winter of 2005/06 had been the principal cause of its poor 2006 results.

4.6 Kemira's management accounts show that the process chemicals business accounted for just over [✂] per cent of the net sales revenues of the businesses that will be contributed to the JV, including revenues arising from deliveries to customers in the Republic of Ireland. The fertilizer business, which accounted for the other [✂] per cent of sales revenues, made a large operating loss (£[✂] million),[23] but process chemicals were profitable (using Kemira's methods for cost allocation).

4.7 Most process chemicals are produced at Ince, but some (mostly urea products) are bought in. The management accounts for 2006 show that the variable margin (sales proceeds less variable costs) as a percentage of sales differs widely between product groups, so that some process chemicals with relatively high sales proceeds provide only a small contribution, for example ammonia. Others, such as nitric acid of 60 per cent concentration, provide a much higher contribution relative to sales proceeds. CO_2 and dry ice, [✂], provided almost [✂] of the variable margin of the process chemicals business. As a result of the closure of the ammonia plant (see paragraph 2.20), production levels for 2006 were lower than in recent years, so that any fixed costs would have been spread over smaller volumes.[24]

Terra

4.8 Terra is a producer and marketer of nitrogen products, serving agricultural and industrial markets, with manufacturing facilities in the USA, Canada and the UK. Its headquarters are in Sioux City, Iowa, and it is quoted on the New York Stock Exchange.

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[20] At an average exchange rate for 2006 of £1 = €1.467.
[21] At an average exchange rate for 2005 of £1 = € 1.463 and for 2006 of £1 = €1.467.
[22] Published 13 February 2007 at:
www.kemira-growhow.com/NR/rdonlyres/FBE32BD0-D2B9-413D-9D76-48341066A8E1/0/2006_Q4Result_eng.pdf (p25).
[23] See Table 1 of Appendix C.
[24] See Table 2 of Appendix C for further information.

UK operations

4.9 In 1997 Terra purchased its two UK manufacturing sites from ICI (see paragraph 2.12). Terra Nitrogen (UK) Ltd owns both sites and is the only Terra company with operations in the UK. Its results for the six years to 2006 are summarized in Table 5.

TABLE 5 **Terra Nitrogen (UK) Ltd: summary of financial performance, 2001 to 2006**

£ million

	2001	*2002*	*2003*	*2004*	*2005*	*2006**
Turnover	163.8	163.6	189.3	210.5	231.5	[✂]
Operating profit	–7.9	13.2	29.0	33.8	17.9	
Operating margin (%)	–4.8	8.1	15.3	16.0	7.7	
Fixed assets (net)	153.3	152.7	140.0	133.4	127.1	-

Source: ICC Plum database from Terra statutory accounts.

*From management accounts.

4.10 Terra's UK operations incurred an operating loss in 2006 for the first time in five years. Turnover fell in 2006 but still remained above the level achieved in each of the years 2001 to 2004. Terra reported that in 2006 its UK operations accounted for 20.4 per cent of group revenues and 25.1 per cent of its long-lived assets.[25]

4.11 Terra's management accounts show that in comparison with Kemira its revenues are more evenly split between fertilizers ([✂] per cent) and process chemicals ([✂] per cent) in 2006. The remaining [✂] per cent of revenue were attributed to its utilities business (water, steam and electricity).[26] Terra's sales fell in value terms by 5.5 per cent in 2006, with a [✂] per cent fall in fertilizer sales being largely offset by increases in sales of ammonia products ([✂] per cent), acids ([✂] per cent) and utilities ([✂] per cent). Terra's definition of gross profit includes manufacturing fixed costs. In 2005, fertilizers contributed less than half of total gross profit and in 2006 their gross profit was negative. (This was also caused by the natural gas price differentials between the UK and mainland Europe which affected Kemira, as noted in paragraph 4.5.) It was mostly the contributions from acids and utilities that gave a small positive profit of £[✂] million before indirect operating costs[27] reduced this to a net operating loss of £[✂] million for 2006. In 2004, when results were not affected by natural gas prices, fertilizers accounted for [✂] per cent of a higher gross profit of £29.5 million. Process chemicals contributed [✂] per cent of gross profit, with the remaining [✂] per cent coming from utilities.

4.12 Terra's volumes sold fell by [✂] per cent in 2006, led by fertilizers ([✂] per cent), and CO_2 ([✂] per cent). Ammonia volumes fell by only [✂] per cent while those for nitric acid increased. Sales prices rose, except for those of CO_2, but generally not as fast as costs. As a consequence, most product groups were loss-making in 2006, with only acids and salts maintaining their margins at 2005 levels. With delivered tonnages of all products falling from [✂] million tonnes in 2005 to [✂] million tonnes in 2006, fixed costs per tonne rose.[28]

[25] 2006 10-K p77.
[26] See Table 3 of Appendix C for further details.
[27] Selling, general & admin and 'other item'. See Table 4, Appendix C.
[28] See Table 4 of Appendix C for further details.

Comparison of the businesses of the parties

4.13 The management accounts of the two companies indicate that in 2006 the sales mix of the two businesses that are to be contributed to the JV was very different.

TABLE 6 **Sales in the UK and Republic of Ireland by main category, 2006**

£'000

	Kemira	*Terra*
Process chemicals Fertilizers Utilities	[✂]	

Source: The parties.

4.14 Terra has a much larger process chemical business than Kemira. Kemira's 2006 sales were almost £[✂] million (£[✂] million if bought-in products are excluded). Terra, which benefits from long-term contracts with customers at what was ICI's Billingham complex, had process chemical sales of £[✂] million, more than [✂] times those of Kemira. Kemira's sales of fertilizers were about [✂] larger than Terra's. Kemira told us that it had only entered the process chemicals business about ten years earlier, and it was primarily a fertilizer business lacking the product diversity of Terra.

5. The proposed merger and the relevant merger situation

Outline of the merger situation

5.1 The parties told us that Terra had first approached Kemira in relation to the formation of the JV in March 2006. On 18 October a memorandum of understanding was signed and due diligence began. Two days later a draft submission was made to the OFT followed by a formal submission on 13 November.

The memorandum of understanding

5.2 The parties agreed that they would establish a joint venture company (JVco), incorporated in England and Wales to be the parent of the JV group. The business of JVco would be to operate a fertilizer and process chemicals business (together with related products and services) with production based in, and resale into, the UK and Republic of Ireland.

5.3 Terra is to contribute Terra Industries Nitrogen (UK) Ltd; Kemira is to contribute Kemira GrowHow Holdings Ltd, and two of its subsidiaries, Kemira GrowHow UK Ltd and Kemira GrowHow Ireland Ltd. [✂]

The rationale for the merger

5.4 The parties told us that the primary objective of the JV was to reduce costs. [✂]

Jurisdiction

5.5 Under section 36 of the Act, the CC is required to decide whether arrangements are in progress or in contemplation which, if carried into effect, will result in the creation of a relevant merger situation such that:

- two or more enterprises cease to be distinct; and
- either the turnover test or share of supply test is satisfied.

5.6 Any two enterprises cease to be distinct if they are brought under common ownership or common control. As described in paragraphs 5.2 and 5.3, under the terms of the proposed transaction the UK fertilizer and process chemical businesses of Kemira and Terra will cease to be distinct.

5.7 Under section 23(1) of the Act, the turnover test is met if the value of the turnover in the UK of the enterprise being taken over exceeds £70 million. As both the parties will each contribute to the JV businesses with over £70 million of annual turnover (see paragraphs 4.3 and 4.9), the turnover test is satisfied.

5.8 We therefore conclude that arrangements are in progress or contemplation which, if carried into effect, would result in the creation of a merger situation qualifying for investigation. The parties did not contest this.

Proposed acquisition of Kemira GrowHow Oyj by Yara International ASA

5.9 At a late stage in our inquiry we received notice of the proposal from Yara International ASA (Yara) to acquire sole control over Kemira. We decided that it was neither necessary nor appropriate for us to reopen our provisional findings to take this proposed transaction into account. Yara's tender offer for the shares of Kemira forms part of a concentration having an EC dimension and so falls to be reviewed under the EC Merger Regulation, and the transaction as a whole is subject to the exclusive jurisdiction of the European Commission. The two mergers are therefore not being considered under the same regime. We were not in a position to make an assessment of how the European Commission might approach the merger and we could not therefore pre-judge what its view of the acquisition might be. From the point of view of our inquiry, the proposed acquisition could have no material bearing on the CC's assessment as it would have no effect on any of the markets we have examined unless and until merger clearances have been obtained. We decided, however, that we would draw the attention of the European Commission to our final report and its findings.

6. The counterfactual

6.1 Our guidelines[29] require us to evaluate the competitive constraints with the merger compared with the situation that would be expected to prevail without the merger, which is referred to as the counterfactual. In considering the counterfactual, we do not look beyond the period that is reasonably foreseeable. In this case, we consider it to be not beyond 18 to 24 months.

6.2 The UK businesses of both parties appear to have been under substantial financial pressure in 2005 and 2006. We noted the impact on these businesses of the high

[29] *Merger References: Competition Commission Guidelines, CC2*, June 2003, paragraph 1.22.

price of natural gas in the UK during the winter of 2005/06 compared with the prices paid by competitors in other countries. We also noted the recent improvement in trading conditions. We obtained an updated forecast for 2007 from Terra and took account of the expectation of Kemira's management of lower natural gas prices, predicting an improvement compared with 2005 and 2006.

6.3 Both parties emphasized how much their profitability was linked to the price of natural gas in the UK, and pointed to the threats that they faced from imports of fertilizers by competitors with access to low-cost natural gas.

6.4 Kemira told us that if the poor financial performance of its UK business were repeated in 2007 and if the JV transaction were not to proceed, it would have to give serious consideration to selling or closing the Ince plant. [✂]

6.5 Terra told us that [✂].[30]

6.6 Neither of the parties submitted that its UK business should be regarded as a failing firm as described in the CC's guidance,[31] but they both argued that the CC should take into account the likelihood that the future competitive strengths of the two businesses [✂].

6.7 We noted that natural gas prices had receded from the levels reached in 2005/06. and we believe that there are no grounds for assuming that the 2005/06 period is likely to be representative of the parties' future performance. Terra's updated forecast for 2007 showed positive EBIT of just over £[✂] million, an improvement of £[✂] million from its earlier forecast. We also noted that Kemira had in a recent presentation been more optimistic about its immediate prospects (see paragraph 4.5). We therefore do not expect that in the absence of the proposed JV the parties would cease their UK activities within the next two years. [✂]

6.8 We therefore expected that in the absence of the proposed JV the parties would continue as separate companies and would compete with each other, in each of the relevant markets, with levels of competition broadly similar to those in the recent past.

7. Straight N fertilizers

Background

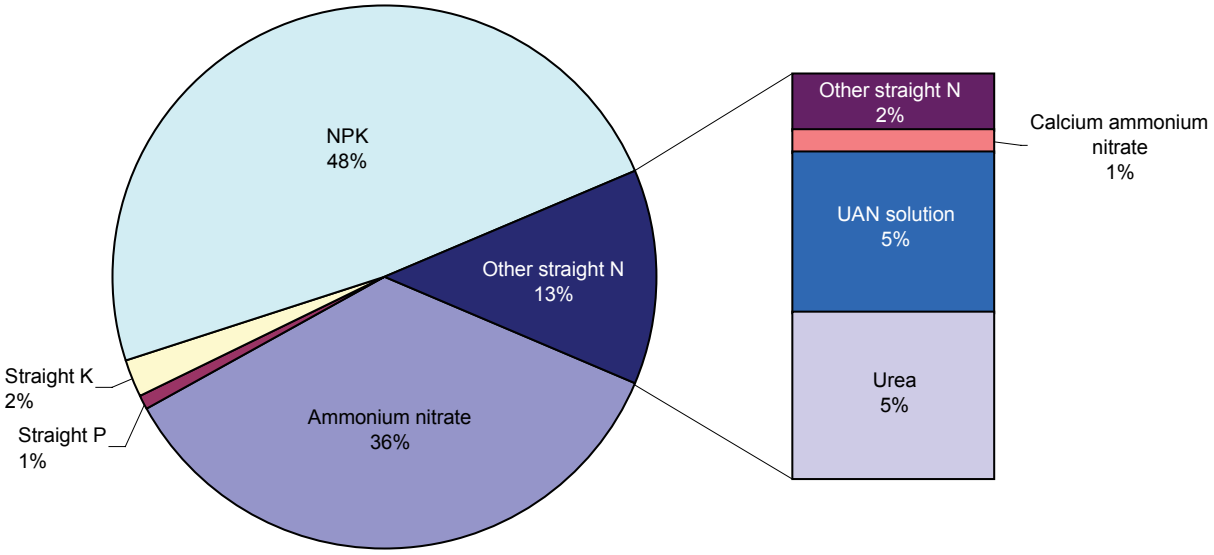
UK demand

7.1 As shown in Figure 2, 49 per cent of fertilizers used in the UK are straight N fertilizers. AN is the most widely applied straight N fertilizer in Great Britain.[32] However, urea, UAN solution, CAN and ANS products are also used by farmers. Most urea-based fertilizers (including urea and UAN) are applied as top dressing to winter cereals, oilseed rape or grass, largely in the February to April period. Very little urea is used on spring cereals and virtually none on potatoes, sugar beet or horticultural crops.

[30] Earnings before interest and tax.
[31] *CC2*, June 2003, paragraphs 3.61 to 3.63.
[32] It cannot be used in Northern Ireland for regulatory reasons related to its possible use as an explosive.

FIGURE 2

Product types as percentage of all fertilizer products used, Great Britain, 2005

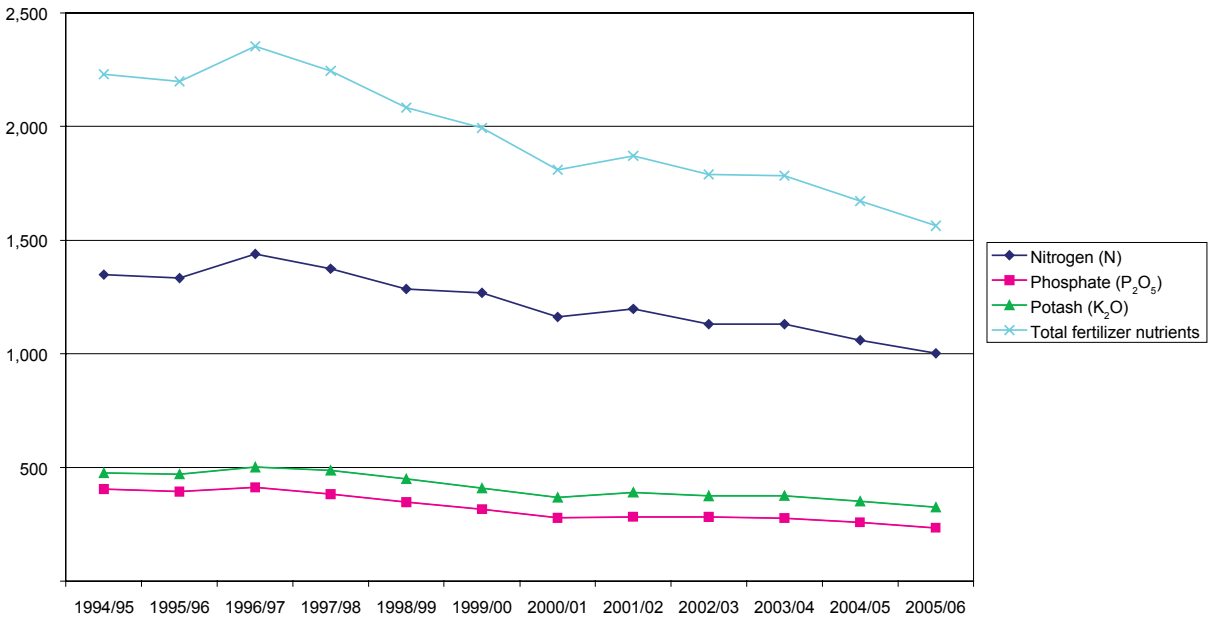


Source: The British Survey of Fertilizer Practice.

7.2 There has been a gradual decline in fertilizer use in Great Britain, as shown by Figure 3.

FIGURE 3

UK consumption of fertilizer nutrients ('000 tonnes)



Source: Agricultural Industries Confederation.

7.3 A business consultancy specializing in fertilizers expects that demand for fertilizers will continue to decline in the UK, in line with other Western European markets. It expects that there will be a degree of switching from AN to other fertilizers containing nitrogen, the most likely candidates being complex fertilizers, granular urea and sulphur-containing fertilizers.

Supply in the UK

7.4 Imports of straight N fertilizers are a persistent component of fertilizer supply in the UK and have represented more than 45 per cent of supply for most of the past five years, as shown in Table 7.

TABLE 7 **Production, import and export volumes of the main nitrogen fertilizers* applied in the UK, 2001 to 2005†**

'000 tonnes of nitrogen

	31 December				
	2001	*2002*	*2003*	*2004*	*2005*
UK manufacturers' sales	469	608	713	770	746
Imports	649	575	646	448	578
Exports	168	86	77	62	37
Imports as a proportion of UK supply (%)	68	52	50	39	45

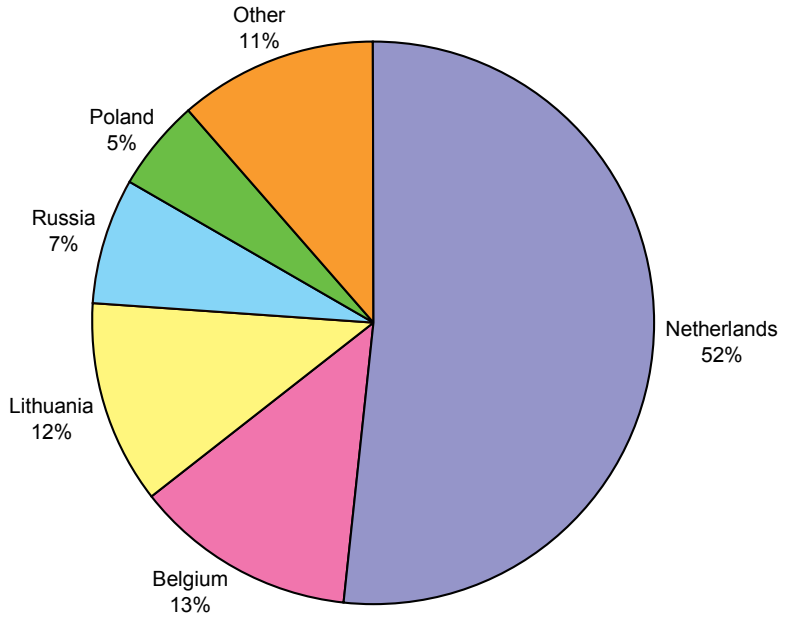
Source: ONS.

*AN, CAN, urea and UAN.
†2006 data not yet available from the ONS.

7.5 AN and CAN are imported mainly from the Netherlands, Belgium, Lithuania and Russia (see Figure 4). Russia and Egypt are the main countries of origin of the urea imported into the UK (see Figure 5).

FIGURE 4

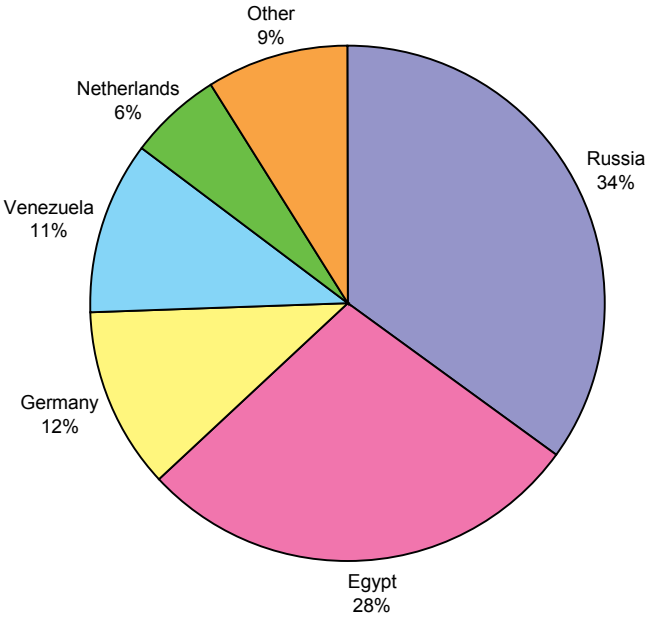
Breakdown of 2006 imports of AN and CAN by country of origin



Source: HMRC.

FIGURE 5

Breakdown of 2006 imports of urea by country of origin



Source: HMRC.

7.6 We considered whether the AN Safety Regulations and the EC anti-dumping measures (see Section 3) were significantly constraining imports of fertilizers into the UK.

7.7 All the importers we spoke to told us that the AN Safety Regulations had had little impact on their ability to import AN into the UK. An international trader of fertilizers told us that the regulations had had no impact on the volumes it was able to import into the UK, although they had made the administrative task of importing more difficult and not all producers were able to make a product suitable for import into the UK.

7.8 In its January 2007 submission[33] to the European Commission, the European Fertilizers Manufacturers Association argued that the anti-dumping measures relating to AN had in general, but not always, been effective, whilst the measures relating to urea had been ineffective. Overall the level of imports from Russia had remained very high despite the anti-dumping measures, as shown in Table 8.

[33]16 January 2007 Application, Anti-Dumping Sunset Review (Article 11(2) of Basic EC Anti-dumping Regulation), Imports of Ammonium Nitrate in Russia.

TABLE 8 **Imports of nitrogen fertilizers from Russia into EU27**

'000 tonnes of nitrogen

	*Agricultural year**				
Product	*2001/02*	*2002/03*	*2003/04*	*2004/05*	*2005/06*
UAN	13.4	43.7	3.3	0	0
AN	371	208	242	100	80
Urea	530	695	733	649	648

Source: Eurostat, December 2006.

*Starts in June.

7.9 Some Western European producers sell a range of products directly to UK customers. In addition, large volumes of fertilizers are imported from other parts of the world, eg Russia, Lithuania, Egypt and Venezuela, by international traders.

7.10 AN and CAN production capacity[34] in Western Europe has been rationalized since 2000 and plant closures have resulted in the removal of 440,000 tonnes of capacity between 2000 and 2005. A business consultancy specializing in fertilizers expects that AN and CAN capacity will remain stable over the next ten years. Capacity is currently slightly greater than demand and the consultancy expects the gap between capacity and demand to widen.

7.11 The JV would have 12 per cent of AN and CAN capacity in Western Europe, and 10.6 million tonnes of European AN and CAN capacity is in the hands of the parties' competitors. Of this, nearly 40 per cent is controlled by Yara (see Table 9).

TABLE 9 **AN and CAN fertilizer capacity in Western Europe, 2006**

'000 tonnes

	AN	*CAN*	*Total N*	*Plant locations*
JV*	1,578	-	1,578	Three plants in the UK
Other Kemira	200	700	900	One plant in Belgium
Yara	1,180	2,950	4,130	Seven plants in France, Germany, Italy, the Netherlands and Sweden
DSM Agro	-	1,450	1,450	Two plants in the Netherlands
Fertiberia	440	750	1,190	Four plants in Spain
Grande Paroisse	980	100	1,080	Three plants in France
BASF†	250	750	1,000	One plant in Belgium
Agrolinz Melamine International	-	680	680	One plant in Austria
Other	315	735	1,050	Plants in Greece, Portugal, Iceland and France
Total Western Europe	4,943	8,115	13,058	

Source: A business consultancy specializing in fertilizers.

*Companies that form part of the proposed JV.
†Nitrogen fertilizers sold by Fertiva under an exclusive agreement with BASF.

7.12 The business consultancy referred to in paragraph 7.10 considers that the gap between capacity and production in the key exporting Eastern European countries will reduce over the next ten years, due to increased domestic consumption, but will remain over 5 million tonnes.

7.13 The same consultancy expects that urea capacity will increase significantly, particularly in the Middle East, over the next few years, resulting in an increase in export volumes from the major urea supplying countries from 30.9 million tonnes in 2006 to 35.1 million tonnes in 2010.

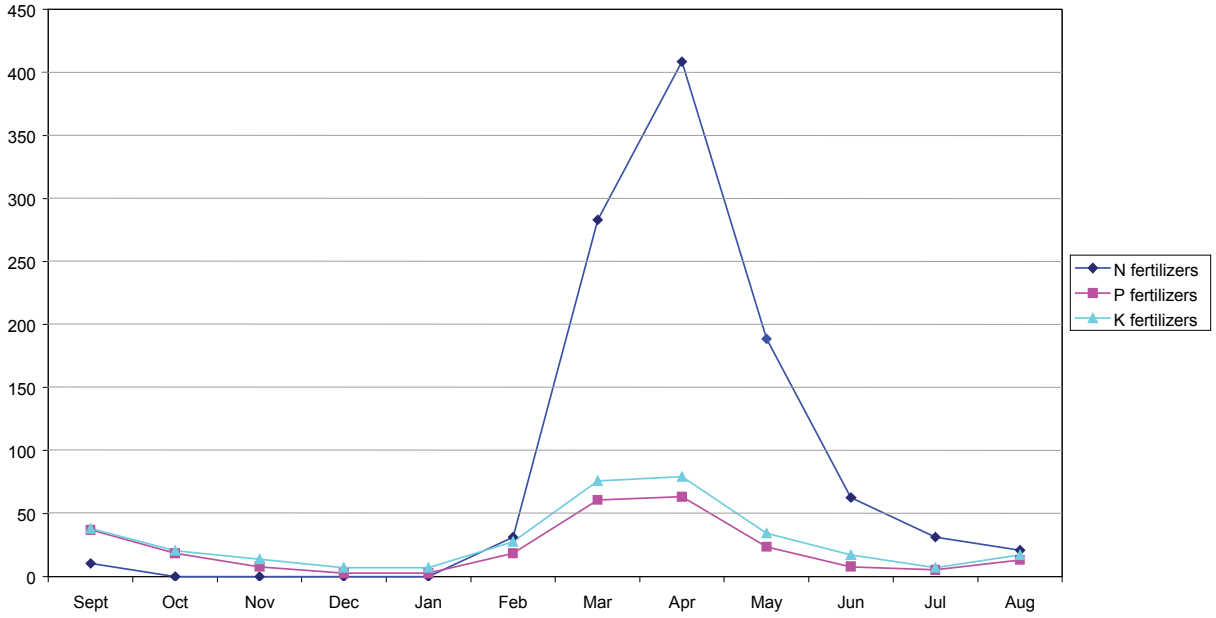
[34]Excludes plants dedicated to the production of porous AN, which is not suitable for fertilizer applications.

Storage and distribution in the UK

7.14 The timing of fertilizer application is determined by the cycle of crop growth, by the local weather conditions, by soil condition and by the type of agricultural activity. Nitrogen has to be applied to arable crops mainly during the period of active growth, which is usually in spring. As a result, over 80 per cent of the demand for N fertilizer is concentrated in three months of the year. Applications of phosphate and potash are not necessarily confined to this season and although their consumption experiences a peak in spring, it is not as pronounced as for N consumption.

FIGURE 6

Nutrient use by month of application, Great Britain, 2005 ('000 tonnes)



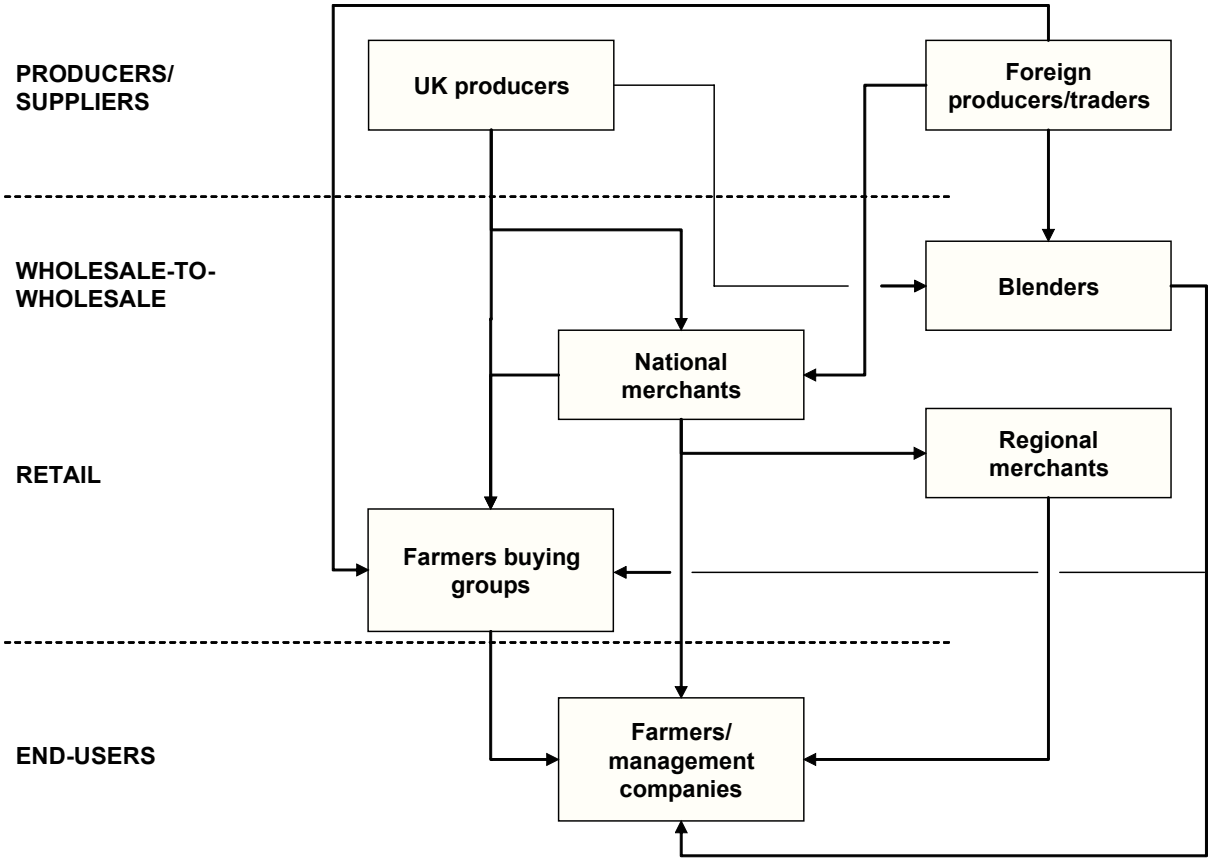
Source: The British Survey of Fertiliser Practice.

7.15 As a result of the mismatch between seasonal demand and continuous production, it is necessary to store substantial quantities of fertilizer. This is accomplished both within the supply chain and by offering discounts during the off-season to encourage farmers to buy in advance and store on the farm.

7.16 As schematically presented in Figure 7, fertilizers are sold by producers either directly to farmers or through merchants or blenders.

FIGURE 7

The fertilizer supply chain



Source: CC, based on Terra and Kemira.

7.17 UK 2006 sales of straight N fertilizers by the parties amounted to £[✂] million. Table 10 shows the various customer groups supplied.

TABLE 10 **Parties' sales of straight N fertilizers to customer groups**

	Sales £m
National merchants	
Other fertilizer companies	
Farmers buying groups	✂
Blenders	
Other distributors and agents	
Direct to farmers	
Northern Ireland and other	

Source: Main parties.

7.18 As shown in Table 11, the parties differ in their use of distribution channels for their straight N fertilizers.

TABLE 11 **Analysis of Terra's and Kemira's sales of straight N fertilizers by key customer type**

	per cent	
	Terra	*Kemira*
National merchants		
Other fertilizer companies		
Farmers buying groups		
Blenders	✂	
Other distributors and agents		
Direct to farmers		
Northern Ireland and other		

Source: Main parties.

Note: 31 per cent of Terra's sales of straight N [✂].

7.19 Traders and European producers told us that blenders purchased a large proportion of the volumes that were imported into the UK. [✂]

Market definition

7.20 There are normally two dimensions to the definition of a market: the product market and the geographic market. The products that should be included in the relevant market and the geographic boundaries of that market are determined by substitutability, ie the extent to which customers can readily switch between substitute products or suppliers can readily switch their facilities between the supply of alternative products.

7.21 Our approach to defining the relevant market, which is set out in our guidelines,[35] seeks to identify the extent to which customers could readily demand, or suppliers readily supply, adequate substitute products in response to a small but significant non-transitory increase in price (SSNIP) imposed by a hypothetical monopolist of a certain product or products and geographic candidate markets, such that the price increase would be unprofitable.

Product market

7.22 The parties overlap in the production of AN and ANS only. We considered whether other forms of straight N fertilizer, particularly urea, are substitutes for AN or ANS.

7.23 One way to assess the degree of substitutability between products is to assess the physical characteristics and end-uses of a product. Between September 2002 and December 2005, the Department for Environment, Food and Rural Affairs (Defra) investigated the substitutability of urea-based fertilizers for AN-based nitrogen fertilizers.[36] Defra's research concluded that urea was less effective than AN from an agronomic perspective for certain types of crop. It also found that urea prills could not be spread to a satisfactory accuracy with commonly used farm spreading equipment. The study also found that there was little difference between the agronomic efficacy of CAN compared with that of AN, but that due to CAN's lower concentration of N, it could have logistical and handling disadvantages.

[35]See *CC2*, paragraph 2.4 et seq. Paragraphs 2.7 and 2.8 explain that the CC will normally hypothesize an increase of around 5 per cent, whilst assuming all other prices remain unchanged.
[36]NT26 Research Programme.

7.24 A major blender told us that it had been considering switching to CAN and to urea. Switching to CAN would be easy because it is compatible with AN. Switching to urea would be more difficult because urea absorbs moisture and therefore could not be used in the same packing line as AN. It could switch to urea but only if it switched an entire packing line. It thought farmers would switch to urea only if there was a price differential of £15 or more per tonne as the quality of urea was lower than for AN.[37] For example, the price differential between AN and urea was large in 2005, and farmers switched to urea.

7.25 A large merchant told us that the world price of urea was an important benchmark when evaluating prices. It said that early in the season farmers would weigh up the relative prices of UK AN and of urea when deciding what fertilizer to use and decide which was the best value. It often received requests from farmers for a quote for both UK AN and urea.

7.26 Another large merchant told us that urea was generally of lower quality than the AN produced by the parties; urea was agronomically less efficient and also raised problems with emissions.

7.27 The parties' view was that urea and AN were sufficiently close substitutes for the vast majority of farmers to determine which product to use on the basis of price, rather than on the basis of any differences in quality or functionality.

7.28 All the urea used within the UK is imported. The question of whether urea forms part of the same product market as AN is therefore linked to the question of geographic market definition and is discussed in detail in Appendix D and in paragraphs 7.29 to 7.41. This analysis suggests that urea does form part of the relevant product market for the reasons given in paragraphs 7.42 and 7.43.

Geographic market

7.29 In order to assess the scope of the relevant geographic market with respect to straight N fertilizers, we looked at three key pieces of evidence. First, we assessed whether the prices of domestically-produced straight N fertilizers (AN) and those of imported straight N fertilizers moved together over time, and whether the cause of that correlation was likely to be substitution. Secondly, we sought the views of market participants, including producers located outside the UK and also traders and merchants located within the UK. Finally, we assessed the composition of imports and the level of imports over time.

Analysis of price movements

7.30 Appendix D provides a summary of our analysis of price movements. The prices of domestic and imported fertilizer move together over time. This is consistent with a wider market which includes both domestic and imported straight N fertilizer. However, there may be a number of alternative reasons why prices of two different products may be correlated over time. We therefore assessed whether the correlation in prices was as a result of substitution, which would be consistent with a wider geographic market, or because of other factors.

7.31 As discussed in paragraph 2.9, the main input for the manufacture of straight N fertilizers is natural gas. There has been a considerable divergence between the

[37]Urea can suffer up to a 10 per cent loss of nitrogen on application; JH Bunn said that farmers took this into account when comparing prices.

prices of natural gas in the UK and those in Continental Europe. We received data showing that in the winter of 2005/06 the price of natural gas in the UK, and the prices paid by the parties, increased considerably. [38] In contrast, the natural gas price paid by European suppliers of straight N fertilizers did not increase over this period. Given such a large and unexpected increase in UK production costs, if the UK constituted a separate market we would expect that prices in the UK would rise. However, as shown in Appendix D, this did not happen.

7.32 We therefore consider that the correlation in prices that we observed was likely to be the result of substitution, or the threat of substitution, by customers between domestically-produced AN and imported supplies of AN and urea.

Views of market participants

7.33 Most customers and merchants that we spoke to were of the view that the market was wider than the UK. We also contacted a number of fertilizer traders; these were also of the view that the market was wider than the UK.

7.34 One large merchant told us that it believed that the relevant market was no wider than the UK and that if prices of AN within the UK increased by 5 per cent it would not change its purchasing pattern. It said that this was because of recent legislation regarding the handling of straight N fertilizers, anti-dumping duties and because the quality of imported product was lower than domestically-produced AN.

7.35 The parties told us that the market for straight N fertilizers was at least as wide as the EEA and that imports were a significant constraint on their fertilizer businesses.

7.36 We invited evidence from a number of producers of fertilizer outside the UK. All of these considered that the market for straight N fertilizers was wider than the UK and that in the event of an increase in price within the UK they could increase supply to the UK.

7.37 For example, one producer told us that it had a plant in France which was well placed to supply the UK and there were no geographic limits to its ability to supply AN. If the price of AN within the UK increased by 5 per cent, it would switch supplies from other areas in order to increase sales to the UK.

7.38 A large importer into the UK also believed that the relevant geographic market was wider than the UK. It told us:

> The prices in the UK influence our sales volume when they don't move in line with international fertiliser prices. In principle, if the UK sales prices decrease compared to the international prices it becomes less attractive for [✂] to sell into the UK market compared to other markets and we might reduce imports somewhat. Similarly if the prices in the UK improve compared to the international prices we might want to redirect sales from other markets into the UK. In reality the fluctuations are small due to the strong correlation between the European prices.

7.39 Another large importer told us that there were no geographic limits to where it could supply straight N fertilizers. If the price of straight N fertilizer within the UK increased

[38] Between November 2005 and March 2006 the UK spot price for natural gas increased from 33.59p/therm to 68.77p/therm, an increase of some 105 per cent. Source: Datastream.

by 5 per cent, this would make the UK market more attractive to it and it would increase supply.

Composition and level of imports

7.40 As explained in paragraph 7.4, imports of straight N fertilizers are a persistent and substantial component of fertilizer supply in the UK. There are substantial imports of both AN and other straight N fertilizer products (including urea) into Great Britain. Table 13 shows a breakdown of the consumption of straight N fertilizers within Great Britain by type of fertilizer.

7.41 As discussed in paragraphs 7.7 to 7.9 and Figures 4 and 5, straight N fertilizers are imported to the UK from a variety of locations. Imported AN originates mainly from the EEA and Russia; and imported urea originates predominantly from Russia and Egypt.

7.42 We consider a high and sustained import share of UK consumption to be consistent with a geographic market that is wider than the UK. The wide variety of sources for straight N fertilizers used in the UK suggests that the scope of the geographic market may be wider than the EEA.

7.43 We find the high degree of correlation in prices between domestic and imported straight N fertilizers, the views of market participants and the high and persistent share of UK consumption accounted for by imports to be persuasive. We therefore consider that the relevant geographic market is at least as wide as the EEA.

Conclusion on market definition

7.44 The evidence considered suggests that the relevant product market comprises the supply of straight N fertilizers and that the relevant geographic market is at least as wide as the EEA.

Competition and the effects of the merger

7.45 Industry statistics are not available for the precise market definition outlined in the preceding paragraph. Table 12 shows the parties' estimates of their shares of supply in the EU.

TABLE 12 **Shares of supply for the sales of straight N fertilizers in the EU 25, 2005/06**

Producer	*Tonnes of nitrogen*	*Share %*
Kemira GrowHow UK		
Terra		
Combined		
Kemira non-UK		
Yara		
Grande Paroisse/AZF		
DSM Agro		
FERTIVA	[✂]	
Fertiberia		
SKW		
Zaklady Azotowe Pulawy SA		
w-Russia		
Anwill Muvek Nitrogen		
Others		
Total		

Source: Kemira estimates and EFMA.

Notes:
1. Units are in tonnes of nitrogen content.
2. Kemira UK volume from Kemira response to market questionnaire Annex 22. Figures for 2006.

7.46 The parties' combined market share is modest (no more than [✂] per cent) and the increment to that share of supply as a result of the merger would also be small (no more than [✂] per cent).

7.47 Table 13 shows that, although the parties are the only remaining producers of straight N fertilizers based in Great Britain, there are substantial volumes of imports accounting for 50 to 60 per cent of consumption. The parties' combined share of supply is just under [✂] per cent for all straight N fertilizers with an increment of [✂] per cent.

TABLE 13 **Consumption of straight N fertilizers within Great Britain, 2005/06**

volume (tonnes)

	All straight N fertilizers	*AN*	*CAN*	*Urea*	*ANS*	*UAN*
Kemira						
Terra						
Combined						
Imports						
Total Great Britain consumption						
Percentage share of Great Britain consumption			[✂]			
Kemira						
Terra						
Combined						
Imports						
Total Great Britain consumption	100.0	100.0	100.0	100.0	100.0	100.0

Source: The parties.

Note: Units in tonnes of final product.

Potential for price discrimination

7.48 Some customers indicated that they would not switch to imported AN or to imported urea in response to a 5 per cent increase in price. We therefore considered the possibility that the JV could increase prices selectively to those customers who would not switch.

7.49 Terra sells all of its output to merchants, blenders, farmers buying groups and other intermediaries. It makes no direct sales to farmers. Kemira sells the majority of its production via merchants and other intermediaries, but sells a small proportion ([✂] per cent) directly to farmers. It therefore appears that in general the JV could only have the ability selectively to increase prices to the small proportion of farmers who currently buy fertilizer directly from Kemira.

7.50 We sought third party views as to the potential ability of the JV to increase prices selectively to direct customers.

7.51 A large merchant told us that there were three main groups of AN customers: those who would always use AN; those who preferred AN but would switch to other types of fertilizer if the price was too high; and those who had no preference that would regularly switch between the AN and other products, sourcing the cheapest. The merchant did not believe that the JV could target the first group in order to raise prices.

7.52 In general, the merchant believed that the majority of farmers sourced fertilizer via merchants. Some of the larger farmers sourced AN from Terra through farmers buying groups, but there was no reason why they could not source through a merchant if the JV increased prices to direct customers.

7.53 We therefore consider that there is little prospect that the JV could increase prices selectively post-merger to those farmers who are unwilling or unable to use either imported AN or other fertilizers. The majority of farmers appear to source through intermediaries; at present only Kemira sells direct to farmers, and if the parties attempted to raise prices to direct customers, those customers could evade this price rise by sourcing through intermediaries.

Conclusion

7.54 The evidence indicates that imports of straight N fertilizers impose a significant constraint on the behaviour of the parties, and would continue to impose such a constraint on that behaviour post-JV. We expect this constraint to be sufficient to prevent any price rises or other adverse effects as a result of the loss of rivalry between the parties in the supply of straight N fertilizers to agricultural customers. We do not believe that the JV would be able to increase prices selectively to customers who would not use imported fertilizer. Accordingly we do not expect that the merger would lead to an SLC in the market for straight N fertilizers.

8. Complex fertilizers

Background

8.1 Complex fertilizers provide a combination of nutrients (nitrogen, phosphate and/or potassium). Complex fertilizers fall into two broad types, compound fertilizers (where nutrients are combined in a chemical reaction to form one compound) and blended fertilizers (where separate compounds containing individual nutrients are combined or blended to provide the required mix of nutrients).

Market definition

Product market

8.2 Evidence received from third parties indicates that there is at least a degree of demand-side substitutability between blended and compound fertilizers. For example, a large merchant told us that there were some farmers that preferred blended fertilizer and some that preferred compounds, and that there was a premium for compounds of up to £10 per tonne. However, if the differential in prices increased beyond £10 per tonne, some customers would be expected to switch to blends. It also told us that the prices of blends and compound fertilizers tended to move together over time.

8.3 Another large merchant told us that farmers could generally use either compounds or blends, but that results with compound fertilizers were always better. In particular, there was a far better accuracy of application with compound fertilizers. This quality difference is reflected in the current prices of blends and compounds. It added that if the price of compounds increased by 5 per cent it would expect some farmers to switch. It believed that if the price differential increased to more than £10 per tonne, a proportion of farmers would switch.

8.4 We received no evidence to suggest that compound and blended fertilizers were in separate markets. We therefore consider that the product market contains, at least, complex fertilizers of both the compound and the blended types. It is possible that the product market for complex fertilizers might be wider and could, for example, extend to include straight N fertilizers; however, for the purpose of our analysis we have defined the market as being for complex fertilizers only.

Geographic market

8.5 There is no evidence to suggest that the geographic market for complex fertilizers is narrower than the UK. There is some evidence that the geographic market may be wider. However, for the purpose of our analysis we have defined the market as UK wide.

Competition and the effects of the merger

8.6 Table 14 sets out the various shares of supply for complex fertilizers in the UK.

TABLE 14 **Shares of supply of complex (NPK) fertilizers in Great Britain, 2005/06**

Producer	*Tonnes*	*Estimated share %*
Kemira		
Terra		
Kemira & Terra	[✂]	[✂]
Yara		
Bunns		
IAWS		
Carrs		
Omex		
Direct imports (non-AIC member)		
Mole Valley (non-AIC member)		
Usborne (non-AIC member)		
Paynes		
Glasson		
MS & P		
Others		
Total		**100.0**

Source: AIC and parties' estimates.

8.7 The parties' combined market share in complex fertilizers would be [✂] per cent which represents an increment of [✂] per cent over Kemira's current share. Terra is a relatively small competitor in the supply of complex fertilizers. Herfindahl-Hirschman Index (HHI) estimates are shown in Table 15.

TABLE 15 **HHI estimates for complex fertilizer in the UK, 2005/06**

HHI pre-merger	1,359
HHI post-merger	1,467
Increment	109

Source: CC estimates.

8.8 We note that the parties focus on different types of complex fertilizer, with Kemira producing compound fertilizers and Terra producing blended fertilizers. Where customers have preferences for one type or the other, the intensity of competition between the parties would be reduced.

Conclusion

8.9 Although the combined market shares of the parties ([✂] per cent) would make the JV the largest supplier in the market for complex fertilizers, we do not consider that this would lead to higher prices or other adverse consequences, particularly given the modest increment resulting from adding Terra's share and the presence of similarly-sized competitors. We noted that the product and geographic markets might be wider than the definition we have used for our analysis. However, use of a wider market definition would not change our conclusion.

8.10 We do not expect that the formation of the JV would lead to an SLC in the market for complex fertilizers.

9. The supply of ammonium nitrate to non-agricultural customers

Background

9.1 AN has other uses apart from that as a fertilizer. The most significant of these, by far, is its use by explosives manufacturers; AN provides oxygen to explosive reactions. AN supplied to non-agricultural customers is known as 'technical ammonium nitrate' (TAN).

9.2 Explosives are produced in the UK mainly by three companies.

9.3 AN is used to make bulk on-site mixed explosives, of which there are two main types:

- AN mixed with fuel oil (ANFO), which is produced by quarrying operators for their own use; and
- AN emulsion, which is mixed on-site with natural gas and fuel to produce an explosive.

9.4 ANFO is not used as extensively in the UK as in other parts of the world, as ANFO is more suitable for use in drier climates. It is manufactured from porous AN (also known as low-density AN, industrial grade AN or explosive grade AN). Porous AN is technically different from AN for fertilizer applications and has different manufacturing requirements. It is also substantially more expensive than AN for fertilizer applications. Porous AN is not manufactured in the UK; the parties estimate that about [✂] tonnes a year of porous AN are imported into the UK.

9.5 AN emulsion is a mixture of AN and oil, with emulsifying agents. This emulsion is not classified as 'explosive' and is easier and safer to transport in bulk in special mixer trucks to quarries where chemicals, and for certain customers solid AN prills, are added to the mixture. To make this emulsion, explosives manufacturers can either buy an AN solution or fully soluble AN prills, which are then dissolved in demineralized water by the explosives manufacturers to make the solution. The AN prills supplied by both the parties for the purpose of making AN emulsion have the same specification, handling and storage requirements as the AN prills they sell as fertilizers; however, the product labelling distinguishes AN for explosives use from AN for fertilizer use.[39]

9.6 AN prills for non-agricultural use are, with minor exceptions, purchased directly[40] from the manufacturers and typically transported in bulk or in bags by road.

Regulation

9.7 Explosives manufacturers import relatively small quantities of porous AN from France and the Netherlands. Such product would fail the detonation test required under The Ammonium Nitrate (High Nitrogen Content) Safety Regulations 2003. For this reason, explosives manufacturers apply for an exemption from the HSE. The HSE told us that all the requests for exemptions to date had been successful and that they were processed within a matter of days if all required documentation was produced. One manufacturer told us that obtaining an exemption was not difficult and that it

[39]However, Kemira and Terra product has different prill sizes: Kemira AN is produced to 2mm diameter whereas Terra AN prills are produced to between 1mm and 3mm diameter. Whilst the AN that the parties sell to their agricultural and explosives customers has the same specification, the parties do not necessarily have the same specification as each other.
[40]In 2005, sales from Kemira and Terra via intermediaries represented about [✂] per cent of UK TAN sales.

took three to four weeks. Although it would not need to seek an exemption in order to import fertilizer-grade AN, it would pursue this approach to avoid having to produce test certificates for each batch it imported. The HSE also told us that it would be possible for an importer to bring in a ship containing certified AN for farming purposes and exempted AN for the explosives industry, provided the two were properly segregated, for example in correctly labelled packages.

9.8 In the course of the inquiry, the parties told us that the FIAS (see paragraphs 3.5 and 3.6) prevented explosives manufacturers from buying AN from agricultural merchants and blenders, but not from importers or other types of intermediaries. The parties later clarified that the intent of the FIAS was not to prevent explosive manufacturers from purchasing AN from any of these sources and that it was only aimed at preventing sales of AN to non-bona-fide customers. The wording of the FIAS has now been changed to clarify this intent.[41]

Market definition

Product market

9.9 In this section we focus our attention on normal density or fertilizer grade AN. We do not examine porous or low-density AN as neither of the parties produces it and evidence received indicates that there is little or no scope for substitution between it and normal density or fertilizer grade AN by customers, or switching of production by manufacturers.

9.10 Customer responses indicate that there are other chemicals that can be used as sources of oxygen in an explosive reaction; however, these are considerably more expensive.[42] Whilst these chemicals may be functionally substitutable for TAN, customer responses indicate that they are not economic substitutes for it.

9.11 We considered whether explosives manufacturers might substitute between TAN and AN sold to agricultural customers. The parties told us that their TAN and fertilizer grade AN products are functionally and chemically identical, differing only in their labelling.[43] The main customers of both parties confirmed that the AN sold by the parties to agricultural customers is chemically identical to TAN.

9.12 AN produced by other suppliers (outside the UK), for sale to agricultural customers, may not be interchangeable with AN produced by the parties for the purposes of producing commercial explosives. The parties' customers told us that they were very sensitive to the level of impurities in the AN that they used and that even traces of impurities could make AN unsuitable for use in explosives manufacture.

9.13 One explosives manufacturer told us that some impurities could cause the explosive mixture to solidify, while others might render a batch of explosives unsafe or unsaleable, leading to large amounts of hazardous waste, which had significant cost implications. Another manufacturer told us that certain AN plants used insoluble anti-caking agents which rendered the AN unsuitable for the production of explosives. and that technical customers were more demanding as regards product quality than agricultural customers. Two explosives manufacturers also raised concerns over anti-

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[41]Source: *FIAS Standard and Guidance Notes for Merchants*, Edition 1, December 2005, produced by the Agricultural Industries Confederation; *FIAS Standard and Guidance Notes for Importers*, Edition 1, December 2005, produced by the Agricultural Industries Confederation.
[42][✂] told us that sodium nitrate was over twice the price of AN and sodium perchlorate was over 15 times the price of AN.
[43]However, although two products may be functionally substitutable, this does not necessarily mean that customers would switch in response to a price rise (and in particular a SSNIP) for either product.

caking agents, and the quality of agricultural grade AN produced by suppliers other than the parties.

9.14 The parties told us that any supplies of AN containing 34.5 per cent nitrogen would be suitable for manufacturing explosives and that AN containing inert impurities which might render the AN unsuitable for explosives manufacture was marked as containing 33.5 per cent nitrogen. They said that AN containing 34.5 per cent nitrogen was a globally-traded commodity product and was available from a wide range of sources, including from plants located in Western Europe. The parties also told us that certain quality issues, such as prill sizes, were less important for non-agricultural customers than for agricultural customers because non-agricultural customers use AN in solution, whereas farmers use AN in prilled form.

9.15 The parties' customers told us that it was difficult to source supplies of AN suitable for explosives manufacture from Western Europe (other than from the UK) and they did not regard 34.5 per cent nitrogen AN as a commodity product with standards that they could automatically rely upon. Rather, in order to minimize risk to their business as discussed in paragraph 9.13, they considered that they needed to source directly from a known production facility of sufficient quality.

9.16 On the supply side, it appears relatively straightforward for the parties to switch between the supply of AN to agricultural customers and AN to non-agricultural customers. However, the parties are the only two producers of AN within the UK. The evidence shows that non-agricultural customers had sourced only limited quantities of AN from other suppliers in the past.[44]

Analysis of prices

9.17 Appendix E provides an analysis of the movement of the prices of the parties' TAN products sold to non-agricultural customers, compared with prices of the parties' AN sold to agricultural customers. If two products are in the same market we would expect their prices to move together over time as a result of either demand- or supply-side substitution.

9.18 The results of this analysis show that the prices of TAN and agricultural grade AN are positively correlated, and move together over time. Once seasonal and trend factors are removed, the price series remain positively correlated over time. As discussed in Appendix E, we carried out statistical tests to determine whether the relative prices of the parties' TAN and AN products were stationary, which would be consistent with a wider product market definition.[45] These tests indicated that the relative price series are stationary and there is no evidence that the relative prices diverged over the time period assessed. It therefore appears that the price of AN sold to agricultural customers was a constraint on the prices charged by the parties for sales of AN to explosives manufacturers.

9.19 However, pricing analysis cannot identify how this constraint operated. Customers switching between two products, or the threat of customers switching between two products, can act as a constraint on the prices of those products, causing them to move together over time; this is known as demand-side substitution. If suppliers can switch quickly and with minimal cost between two products, this may also constrain pricing and cause the prices of both products to move together over time; this is known as supply-side substitution.

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[44] All three explosives manufacturers have in the past purchased limited volumes from outside the UK.
[45] A series is defined as stationary if it has a constant mean and variance over time.

9.20 Customers told us that they had not switched, or threatened to switch, to a supplier other than Kemira or Terra in the past few years. However, the parties told us that explosives manufacturers regularly used the agricultural price of AN in negotiations. It is therefore unclear whether the observed correlation in prices was as a result of demand- or supply-side substitution.

Geographic market

9.21 We considered whether imported TAN constrained the price of TAN sold within the UK.

9.22 One explosives manufacturer told us that a 5 per cent increase in price would not be sufficient to make it worthwhile to import AN. It had recently imported a trial quantity of TAN from Russia. However, the delivered price of this product was about £[✂] per tonne, which was some [✂] per cent higher than the price charged by its current supplier ([✂] £[✂] per tonne).

9.23 Another explosives manufacturer told us that if the price of AN from UK suppliers increased by 5 per cent, it would be likely to absorb the price rise, then pass it on to its customers at the next price review. It said that if the price increased by a larger amount, around 20 per cent, then it would consider switching to another supplier outside the UK. In the past, it had successfully imported Russian TAN into the UK. However, this option was no longer economic at or near current prices as Russian TAN was currently subject to an anti-dumping duty.

9.24 A third explosives manufacturer told us that it had in the past sourced small volumes of TAN from outside the UK from Lithuania through an agricultural merchant. It had also procured a very small quantity for testing purposes, through a trader, from Russia. However, these sources of supply were used because of shortages of supply from UK producers and because of price increases. It would not source from outside the UK in response to a 5 per cent increase in price.

9.25 The parties' view was that AN sold to non-agricultural customers formed part of a wider fertilizer market, which was at least EEA wide in scope, and that import of AN for explosives manufacture was economically viable and an effective constraint on prices at current levels. The parties also told us that there were alternatives to importing directly, including arranging imports through merchants, traders and blenders. The parties noted in particular that blenders use large quantities of bulk AN to produce NPK and that this could be a source for non-agricultural customers. The possibility of customers sourcing through intermediaries is discussed in more detail in paragraphs 9.37 to 9.43.

Conclusion on market definition

9.26 The evidence suggests that TAN currently forms part of a wider market which includes AN sales to agricultural customers. However, the relevant market definition might be affected by the merger, as one source of competition—the parties substituting between AN sales to agricultural and non-agricultural users—will be removed.

9.27 For the purposes of our analysis, we conclude that TAN forms part of a wider market as defined in paragraph 7.42. However, we consider in the context of the effects of the merger (paragraphs 9.37 to 9.43) whether TAN customers constitute a distinct customer group that may be vulnerable to a targeted increase in price after the merger.

Competition

9.28 Table 16 shows the parties' shares of supply of AN to technical customers in the UK. As the table shows, the volumes of TAN supplied appear to be growing. The parties told us that the TAN business was growing because of a general migration away from packaged explosives and ANFO to 'emulsion matrix explosives' which use more TAN.

TABLE 16 **Shares of supply of AN to explosives manufacturers in the UK, 2002 to 2006**

		2003	*2004*	*2005*	*2006*
Volume ('000 tonnes)	Terra	[✂]			
	Kemira				
	Total				
Share of supply (%)	Terra				
	Kemira				
	Combined	100.0	100.0	100.0	100.0

Source: CC estimates based on the parties' sales data.

9.29 Third party responses indicate that contracts for the supply of AN to technical customers are rare. One explosives manufacturer told us that prices were set by way of monthly price offers by Kemira and Terra.[46] Another said that it purchased AN on the basis of monthly or sometimes three-monthly price offers by Terra.[47]

9.30 Switching supplier is infrequent but can affect a large volume of business when it does take place. Terra was unable to supply switching data. As far as Kemira is aware, there were only three instances of switching between the parties in the past five years. However, the threat of switching can be an effective constraint on pricing as long as that threat is credible. There are few contracts, and it appears to be very easy for customers to switch between the parties. For example, two explosives manufacturers said that switching was quick and easy. One explosives manufacturer currently sources from both the parties and buys from whichever is the cheaper at that time and said that if it were to switch between the parties, it would expect to do so on similar terms.

9.31 Given that the threat of switching would appear credible, we would not necessarily expect to see a great deal of switching in practice.

9.32 [✂] explosives manufacturers, however, told us that they had not sourced from [✂]. This pattern in pricing is reflected in the results of our price study in Appendix E.

9.33 One explosives manufacturer told us that the quality of AN produced by Kemira was superior, as the size of its prills was more consistent, which made its AN particularly useful for explosives manufacture. In addition to this, Kemira supplied bagged product in more weather-resistant bags, which allowed for easier storage. As a result, although Kemira's prices were higher than Terra's, this manufacturer still sourced from both parties.

[46] [✂]
[47] Prices are set for deliveries one month in advance.

Effects of the merger

The impact of the merger on rivalry

9.34 The proposed JV would be the only supplier of TAN in the UK. All three of the parties' main customers had concerns about the proposed JV's implications, in particular a loss of competition, security of supply and potential price rises.

9.35 The parties told us that they considered that the JV would not lead to potential price rises, due to the scope for imports (discussed earlier in paragraphs 7.33 to 7.41) and the possible use of the parties' agricultural grade AN.

9.36 We concluded in paragraph 7.54 that the proposed JV would not lead to a significant loss of rivalry in the market for the supply of straight N fertilizers. However, non-agricultural customers form a distinctive customer group, with particular needs, which might leave them vulnerable to a selective increase in price post-merger. We consider this possibility below.

Scope for a selective price rise to non-agricultural customers

9.37 We considered whether explosives manufacturers could obtain fertilizer grade AN supplied by the parties. We also considered whether these manufacturers could obtain suitable sources of AN through intermediaries and substitute this for the TAN supplied directly by the parties. However, third parties told us that this had not happened in the past. Traders, blenders and merchants had not supplied, nor considered supplying, explosives manufacturers in the past and explosives manufacturers themselves had not sourced AN through intermediaries in the past and indicated that they remained reluctant to do so.

9.38 A major trader and importer of fertilizer products told us that current regulations meant that traders could only sell to known customers on account. In principle, there was nothing preventing a trader supplying a non-agricultural customer. However, that trader had never supplied AN to an explosives manufacturer. In addition, it noted that AN for explosives manufacturers tended to be packaged and sold separately from AN for agricultural use. The trader said that there might also be some differences in the chemical make-up of AN for explosives manufacturers and the product that it supplied.

9.39 An explosives manufacturer told us that it would not source AN through a trader, merchant or distributor because it preferred to control the supply of product and because dealing direct offered greater security of supply. It believed that sourcing through a trader would be more expensive because the product would need to be transported and handled twice and because the trader or merchant would add on its own margin. That manufacturer currently purchased around 80 per cent of its AN in bulk. The parties told us that traders and merchants tended not to carry bulk AN, supplying the majority of their customers with bagged product. Both this manufacturer and the one recorded in paragraph 9.40 shared the same objection to switching from bulk AN to bagged product. This was because it would add further costs as bagged product was more expensive (approximately £5 per tonne) and because transporting bagged product was more expensive due to smaller loads and thus increased handling costs.[48]

[48] [✂] told us that a typical bulk load would comprise 28 tonnes whereas a bagged load would be around 24 tonnes.

9.40 Another large customer told us that it could source AN directly only from manufacturers and that it could not source from any supplier which bought AN on the spot market. It considered it feasible to source AN directly from the parties, using the same delivery infrastructure, but instead invoicing a trader or merchant. It also told us that the main barrier to sourcing through a trader or a merchant was that the manufacturer would have to accept a higher price. It currently received a discount from the 'on-farm' AN price. A 5 per cent increase in price by the JV would not be sufficient to make agricultural prices an attractive option.[49] However, sourcing through a trader or merchant was not something that it had had to consider in any detail in the past.

9.41 It therefore appears that, because of their greater need for product quality and security of supply, explosives manufacturers do not source AN from merchants and traders in the same way that agricultural customers do. In addition, explosives manufacturers' preference for bulk shipments of TAN, rather than the bagged product typically purchased by farmers, and the prospect of double handling may explain why, in the past, when there were two suppliers competing to supply TAN directly, customers did not seek alternatives.

9.42 However, in the context of a sustained price rise by the JV, we consider that explosives manufacturers would have an incentive to seek alternative supply channels which they had not previously needed to consider. Merchants and traders will similarly have a potentially profitable opportunity to supply non-agricultural customers, which they have not faced before. We therefore do not consider that the fact that these supply channels have not been used in the past indicates that these alternatives would not be used in the future.

9.43 We consider that explosives manufacturers are sufficiently large to form an attractive opportunity for merchants. Whilst at present merchants do not offer the assurances that non-agricultural customers want regarding product quality and security of supply, in response to demand they may be prepared to do so and thus be able to supply non-agricultural customers effectively. Merchants and traders may have been inhibited in the past by regulatory confusion and uncertainty about end-users. This inhibition is likely to be substantially reduced by the emerging clarity in the regulatory regime.

Other competitive constraints:

Entry and expansion

9.44 AN for sale to explosives manufacturers is produced using the same production facilities as AN for sale to agricultural customers. The issues surrounding entry are therefore the same as for AN in general. Due to existing excess capacity in AN production in the UK, declining demand for fertilizers and the large capital costs of entry, it does not appear likely that there would be new entry in the production of AN within the UK for the foreseeable future (see paragraph 7.10).

Buyer power

9.45 The buyer side of the market for TAN is relatively concentrated, there being two main customers. However, the exercise of buyer power is also dependent on other factors such as the ability of customers to switch to rival producers. The sale of AN to

[49] [✂] currently paid £[✂] a tonne for AN delivered in bulk shipments. [✂] believed that the typical 'on-farm' price was approaching £[✂] a tonne. [✂] would potentially be able to secure a discount to around £[✂] a tonne.

explosives manufacturers is a very small part of the parties' respective businesses, whereas AN is a very important input into explosives manufacture. Explosives manufacturers would therefore appear to be more reliant on the parties than the parties are reliant upon the manufacturers. None of the parties' customers considered that they enjoyed buyer power.

Conclusion

9.46 The JV would merge the two UK producers of AN; non-agricultural customers obtain currently almost all their supplies from these two producers. We have considered the evidence and views put to us by both the customers and the parties. Non-agricultural customers, which have somewhat different requirements from agricultural customers, have not in the past had strong needs to seek alternative sources of supply, although they have investigated this to some degree. For this reason there is little firm evidence as to the practicality and effectiveness of alternative sources of supply. The views of the parties and their customers differ; in forming our view we have taken careful account of the evidence and arguments put forward.

9.47 The potential alternative sources of supply available to non-agricultural customers include imports from suitable producers, imports facilitated by merchants and AN produced by the parties but sourced through a merchant. Customers identified difficulties with each of these approaches. However, we expect that if the customers were faced with significant price increases there would be stronger commercial incentives for both the customers and third parties (other producers and merchants) to develop alternative arrangements.

9.48 In our view, each of the alternative supply channels is potentially viable, although we recognize that there are obstacles to be overcome. On balance, we consider that one or more of the alternatives would be practically and economically viable, thereby constraining the JV's prices.

9.49 We therefore consider that the JV would not be able to implement a selective increase in prices to non-agricultural customers and the formation of the JV may not be expected to result in an SLC in the supply of AN to non-agricultural customers.

10. Carbon dioxide

Background

10.1 CO_2 is a by-product of the production of ammonia (as described in paragraphs 1.2 and 1.3). Other sources include other chemical processes, fermentation, deep gas wells, and direct production from carbonaceous fuels. We refer to the CO_2 produced by these sources as raw CO_2; to be commercially usable, the raw CO_2 must be purified and liquefied. It may also be solidified; solid CO_2 is known as dry ice. Raw CO_2 that is not processed is vented into the atmosphere.

10.2 Although many industrial processes emit CO_2, these emissions are not necessarily suitable for commercial use: low CO_2 concentration in the flue gas and low purity levels affect the economic viability of CO_2 recovery. For example, although power plants emit large quantities of CO_2, the CO_2 concentration in the flue gas is very low, making CO_2 recovery expensive.

10.3 In the UK, liquid CO_2 is recovered from ammonia production at the three plants owned by the parties. It is also produced by two other companies: Air Products, a producer of specialist gases, and North British Distillery, a whisky producer. Dry ice is

produced by Air Liquide at Ince and by Yara at Immingham [✂]. Neither Terra nor Kemira produce dry ice.

10.4 Table 17 shows CO_2 liquefaction and solidification plants in the UK.

TABLE 17 **CO_2 recovery plants in the UK**

Location	*Ownership and operation*	*Raw CO_2 source*	*Product*	*Total capacity ('000 tonnes a year)*
Billingham	Owned and operated by Terra	Ammonia production	Liquid CO_2	✂*
Severnside	Owned and operated by Terra	Ammonia production	Liquid CO_2	
Ince	Owned by Air Liquide, operated by Kemira	Ammonia production	Liquid CO_2 and dry ice	
Wilton	Owned and operated by Air Products	Hydrogen production	Liquid CO_2	
Edinburgh	Owned and operated by North British Distillery	Grain fermentation	Liquid CO_2	
Immingham	Owned and operated by Yara	Liquid CO_2 purchased from Terra	Dry ice	N/A

Source: Companies.

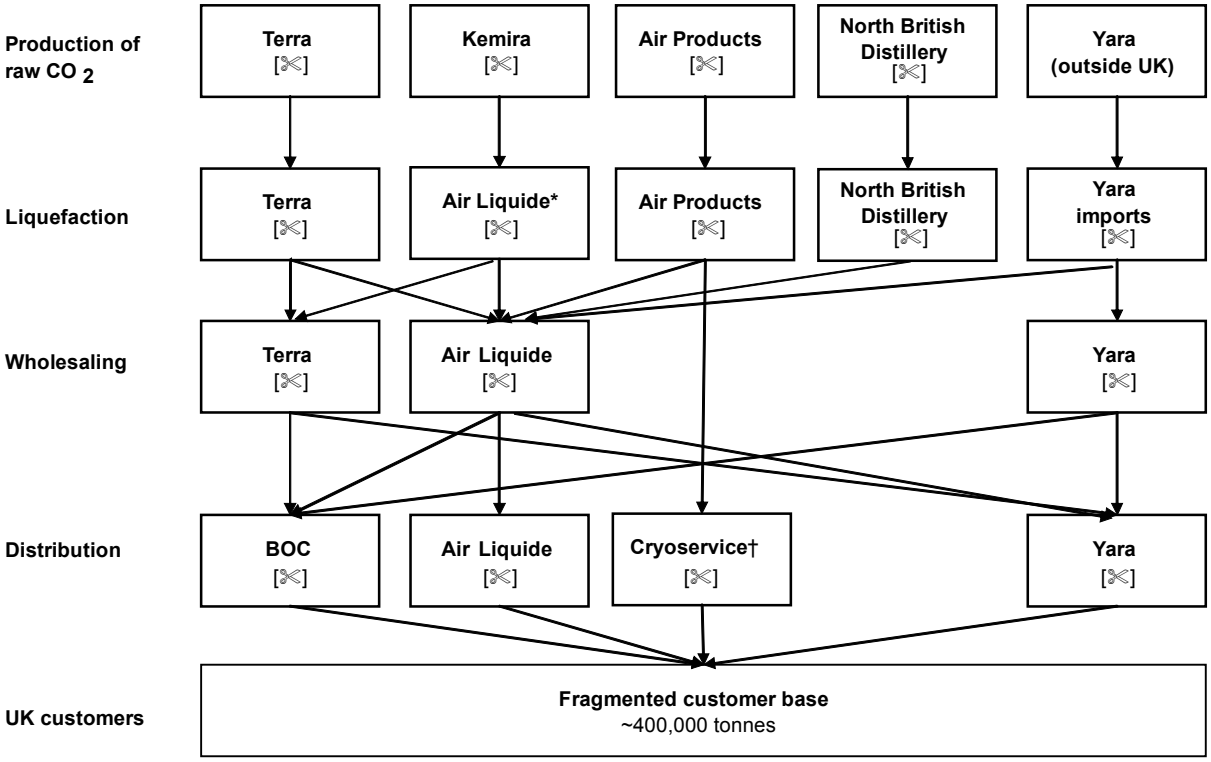
*The capacity to produce CO_2 has increased from [✂] tonnes a year to [✂] tonnes a year, that is [✂] tonnes an hour (instead of [✂] tonnes an hour when the plant was commissioned), [✂] a day, [✂] a year.

Distribution and storage

10.5 Figure 8 presents the typical supply chain for liquid CO_2. It is based on estimates provided by market participants and historic purchase and sales figures where available. In late 2005/06, the exceptional closure of the UK's ammonia plants (paragraphs 2.19 and 2.20) resulted in a considerable growth in imports of CO_2. In order to illustrate the supply chain, volume estimates have therefore been based on three-year averages.

FIGURE 8

Liquid CO_2 supply chain



*Plant at Ince owned by Air Liquide and operated by Kemira.
†[✂]
Source: Companies' historic purchase and sales records; CC analysis.

10.6 The CO_2 liquefaction plant situated on Kemira's site in Ince is wholly owned by Air Liquide, one of the four distributors of CO_2 in the UK, and is operated by Kemira on Air Liquide's behalf in return for a fee. Air Liquide leases the land on which the plant is located from Kemira. The operating, management, maintenance and supply agreement that governs the relationship between the two parties was signed in 1997, for an initial [✂].

10.7 Suppliers of CO_2 tend to have only limited storage capacity. One distributor estimated that suppliers would have about a week's worth of stock or storage capacity; Air Liquide's Ince plant has [✂] tonnes of storage capacity, divided into [✂]. Air Liquide told us that some storage is held at customers' premises and ranges between [✂].

10.8 Distribution is carried out in bulk using specialist pressurized road tankers or in cylinders (particularly where the CO_2 is mixed with other gases). A distributor said that 75 per cent of UK purchases by volume were delivered in bulk. Bulk liquid CO_2 is typically delivered straight from the liquefaction plant to the end-users.

Demand for CO_2

10.9 CO_2 has many useful properties: it is an expendable refrigerant; it is highly soluble in water at moderate pressure, and in oils and plastics at elevated pressures; it is a solvent for a number of substances and its dryness prevents damage to sensitive materials; it is chemically reactive at high temperatures and inert to most substances at ambient to moderate temperatures.

10.10 The largest user groups are the food and beverage sectors and the nuclear industry. CO_2 is also used in horticulture, the oil and gas industry and in chemical industries. Demand from the food and beverage sectors varies seasonally with highest demand in summer and autumn.

10.11 For some applications, CO_2 is sold in a mixture with other gases, eg for dispensing beer and soft drinks, for welding products, or for various calibration gases and medical gases.

10.12 For certain user applications, particularly in the food and beverage sector, the quality, purity and source of the CO_2 are important. For food-grade CO_2, standards of purity have been developed in order to guarantee that contaminants have been removed to a level where they will not influence taste and odour and where they will be harmless to the health of consumers. Other elements such as water (humidity) and oxygen are also removed to a level which is acceptable to the process requirements at the plants that subsequently use the CO_2. In order to run a liquefaction plant effectively, all the CO_2 produced needs to be purified to the same standards.

10.13 Some customers, particularly in the food industry, wish to approve product from a particular plant, which they certify as suitable for the supply of CO_2, having satisfied themselves with the plant's ability to trace the CO_2 source.

10.14 Sales of CO_2 have been falling slowly for several years, due to the gradual decline and rationalization of the nuclear and food and beverages industries. One distributor told us that demand in the food industry remains stable and may be growing, whilst some of the pharmaceutical and manufacturing sectors are growing.

Market definition

Product market

10.15 As shown in Figure 8, the parties overlap in the production of raw CO_2 gas suitable for purification and liquefaction. Terra liquefies its own gas for onward sale to distributors, whereas Kemira sells its raw CO_2 gas to Air Liquide which then liquefies it and markets it onward.[50] There are three main gas distributors (Yara, which also imports its own CO_2;[51] Air Liquide; and BOC), which collect CO_2 from liquefaction plants and distribute to final consumers.

10.16 Neither the distributors nor the producers considered that there were substitutes for CO_2 for the vast majority of end-users. As a result of this there is also little prospect for demand-side substitution by distributors.

10.17 There is also no prospect of supply-side substitution in the production of CO_2 as the raw gas and the liquefaction plants cannot be put to other uses.

10.18 There are, however, a number of different sources of raw CO_2 available to distributors.

10.19 The main source of raw CO_2 in the UK is from ammonia production, but there are plants within the UK producing CO_2 for liquefaction from hydrogen production and from fermentation.

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[50]Although, as discussed in paragraph 10.6, Kemira operates and maintains the Ince liquefaction facility on behalf of Air Liquide.

[51]Yara has the infrastructure to enable its imports. However, the background to this is historic and the evidence received does not suggest that it would be worthwhile for other parties to invest in such infrastructure to import CO_2. See paragraph 10.28ff.

10.20 [✂] noted that there may be some restrictions on the end-use of liquid CO_2 based on the source of raw CO_2. However, other distributors said that though different sources of raw CO_2 have different types and levels of impurities, this does not affect the final product, which is produced to a standard level of purity. It appears that for the purposes of distributors, the sources of CO_2 available in the UK are interchangeable once the CO_2 is liquefied.

10.21 We consider that the relevant product market for our inquiry is for the supply of CO_2 to distributors. This includes the supply by Kemira of CO_2 to Air Liquide at Ince.

Geographic market

10.22 CO_2 is transported in liquid form. Distributors typically collect CO_2 from the source plant or import terminal and deliver it by specialist road tanker to users. The three main distributors (Air Liquide, BOC and Yara) operate and deliver nationally.

10.23 Yara has two specialist import terminals in the UK at Purfleet in Essex and at Middlesbrough.

10.24 Comments from distributors indicated that the relevant geographic market for the supply of CO_2 was no wider than the UK. No third party considered the relevant geographic market to be any wider than the UK.

10.25 Comments from distributors indicate that transport costs typically make up between 20 and 25 per cent of the final price to customers. [✂] told us that, in its opinion, at current prices, it was viable to transport CO_2 up to 100 to 150 miles. [✂] said that it was viable to transport liquid CO_2 up to around 150 to 200 miles. [✂] told us that it tried not to deliver CO_2 to a distance of more than 100 miles and that the distance over which CO_2 could be transported economically depended on where the next nearest source of CO_2 was located.

10.26 The parties' view was that the geographic market for the supply of CO_2 included UK producers and those EEA producers with access to infrastructure to supply the UK. This includes Yara's current imports of liquid CO_2.

10.27 Although the high cost of transport, relative to the retail price of CO_2, was considered important, responses from distributors suggested that there is sufficient overlap between the sources of CO_2 such that there are no regional markets within the UK.

Imports

10.28 There are two main methods whereby customers may import liquid CO_2. The most cost-effective method is to import using specialist ships and import facilities. This is the method currently used by Yara. Yara told us that to ship from Yara production sites to UK ports costs approximately £[✂].[52] Yara's net imports into the UK are shown in Table 18.

[52]Other distributors' comments were not consistent with this, but their experience was under conditions of short-term supply constraints in the UK and did not relate to long-term arrangements. See paragraphs 10.30 and 10.31.

TABLE 18 **Yara imports of CO_2 into the UK, 2002 to 2006**

tonnes

	2002	*2003*	*2004*	*2005*	*2006*
Imports Tees					
Exports Tees					
Tees net imports			[✂]		
Imports Purfleet					
Net imports					

Source: Yara.

10.29 Distributors were generally of the view that although imports were possible, it was unlikely in the event of a 5 per cent increase in the ex-works prices of CO_2 within the UK that imports would rise significantly.

10.30 Air Liquide told us that it had imported liquid CO_2 in the past, out of necessity, when the main sources of CO_2 in the UK shut down due to high gas prices in the winter of 2005/06. Air Liquide told us that its cost of sourcing CO_2 increased [✂] during this period. It also said that there were problems over the availability of imports as there was very little spare capacity elsewhere in Europe.

10.31 BOC told us that during the same period it imported mainly through Yara's terminal at Middlesbrough, but supplemented this with small volumes imported by road tanker. This resulted in significant increases in liquid CO_2 procurement costs.

10.32 It is possible that distributors would be able to set up their own import terminal and specialist shipping. However, this would require significant investment in port facilities and specialist shipping and would take considerable time. One distributor estimated that to set up an import facility would require investment of £2–£3 million with a further £1 million for specialist ships and would take around two years, although it had not undertaken a detailed assessment. [✂] told us that a specialist ship would cost £6–£7 million with a lead time of at least 24 months.[53]

10.33 Third-party comments indicate that the importing of liquid CO_2 into the UK by road haulage is uneconomic. One distributor told us that the extra road haulage costs of importing liquid CO_2 by tanker were around £100 to £110 per tonne. Another distributor told us that liquid CO_2 required specialist road tankers, and that the additional miles travelled in order to import by tanker would necessitate a larger fleet. Specialist tankers are not readily available and are costly to purchase. In addition, connector equipment in other EU countries can differ, which could necessitate specialist equipment and driver training.

10.34 Appendix F provides an analysis of the impact of production shutdowns by the parties in the winter of 2005/06. Over this period the parties suspended the production of ammonia in the UK because of high natural gas prices. As CO_2 is a by-product of ammonia production, this had the effect of also stopping UK output of CO_2 at their plants. This in turn resulted in a severe supply shortage. Distributors sourced from outside the UK, both by direct imports and by road tankers. This caused a large increase in costs for distributors. We do not consider that the possibility of imports other than those of Yara constrains prices.

[53]This compares to a UK market size for CO_2 of approximately £15 million a year at wholesale level.

Conclusion on market definition

10.35 We consider that the relevant market comprises the supply of CO_2 to distributors within the UK. This includes the supply by Kemira of CO_2 to Air Liquide at Ince and supplies to distributors through the import terminals operated by Yara.

Competition

10.36 Terra and distributors typically negotiate [✂] contracts with prices fixed over the term or containing an escalation clause [✂].

10.37 Table 19 shows shares of supply and shares of liquefaction capacity. These shares of supply are based on 2006 volumes and therefore include the effects of supply shutdowns that occurred in early 2006. They are therefore likely to underestimate the parties' shares of supply, and overstate those of Yara, compared with those we may expect to see under normal conditions. Table 20 shows shares of supply using the parties and Yara's output levels in 2005.

TABLE 19 **Market shares of CO_2 production and imports, 2006**

	Output ('000 tonnes a year)	*Total installed liquefaction or import capacity ('000 tonnes a year)*	*Spare liquefaction or import capacity ('000 tonnes a year)*	*% share by output*	*% share of liquefaction capacity*
Terra Billingham Terra Severnside Kemira Ince *Combined* Yara Air Products North British Distillery	✂				
Total	461	794	333	100.0	100.0

Source: CC estimates based the parties data and on third party responses.

TABLE 20 **Market shares based on the parties' 2005 production**

	Output ('000 tonnes a year)	*% share*
Terra Kemira *Combined* Yara Air Products North British Distillery	✂	
Total	497	100.0

Source: CC estimates based on the parties' data and on third-party responses.

Notes to Tables 19 and 20:
1. Terra volumes adjusted to account for cross-sales from Ince of about [✂] tonnes a year.
2. As historic data on North British Distillery and Air Products production volumes is not available, their output is assumed to be the same as 2006 estimates.
3. Ince output includes CO_2 used to make dry ice.

10.38 After CO_2 sourced from Kemira and Terra, [✂]. Yara told us that its imports to the UK varied from year to year but averaged approximately [✂] tonnes (around [✂] tonnes net of exports) of liquid product a year. Yara has a total capacity in Europe of about [✂] tonnes a year; however, its sales to the UK are limited by the capacity of its import terminals and specialist shipping fleet. Yara estimated that, using its

existing facilities, it could increase imports though these terminals to [✂] tonnes a year [✂].[54]

10.39 Air Products produces raw CO_2, which is then liquefied, as a by-product of hydrogen production, at a plant at Wilton near Middlesbrough. This plant has a capacity of around [✂] tonnes a year, [✂] sold to Air Liquide ([✂] tonnes) or sold by Air Products to its own customers.

10.40 North British Distillery produces and liquefies [✂] tonnes of raw CO_2 as a by-product of fermentation at its plant in Edinburgh. [✂] of this volume is currently sold to Air Liquide. It has the capacity to produce [✂] tonnes a year using its existing facilities.

10.41 The parties argued that there was no overlap in their activities. They told us that although Kemira produced raw CO_2 at its Ince plant, the liquefaction and marketing of that gas was carried out by Air Liquide using its own liquefaction plant. The parties argued that Kemira was therefore not active in the production or supply of liquid CO_2. Terra, in contrast, produces raw CO_2 and liquefies it for onward sale to distributors. In the parties' view, Kemira is constrained by the existing contract between Kemira and Air Liquide.

10.42 However, as noted in paragraph 10.6, the current contract has a requirement for Kemira to sell a minimum of [✂] tonnes of CO_2 to Air Liquide. The volume of production at Ince is decided annually by Kemira and Air Liquide. There is therefore scope within the current contract for Kemira to affect the level of annual output at Ince above the [✂] tonnes minimum. Over a longer timescale, the contract for the operation of the Ince plant could be terminated unilaterally by Kemira [✂].

Effects of the merger

10.43 Tables 19 and 20 show that the proposed JV would result in a high combined share of the supply of raw CO_2 which can currently be liquefied ([✂] per cent by volume and [✂] per cent by capacity) and a large increment ([✂] per cent by volume and [✂] per cent by capacity).

10.44 Based on the parties' 2005 output, which is more representative of normal trading conditions, the JV would have a market share of [✂] per cent with an increment of [✂] per cent by volume. Table 21 shows HHI estimates based on the information in Tables 19 and 20. On all the measures that we considered, the post-merger HHI is large and the increment is significant.

TABLE 21 **HHI estimates for the production of raw CO_2**

	Volume 2006	*Volume 2005*	*Liquefaction capacity*
HHI pre-merger	2,713	3,232	3,712
HHI post-merger	3,909	4,798	5,276
Increment	1,196	1,566	1,563

Source: CC.

10.45 The loss of Ince as an independent alternative source of supply to Terra's facilities at Severnside and Billingham may alter the negotiating position of the major distributors with Terra. Air Liquide can currently source in the range of [✂] tonnes to [✂] tonnes

[54]See Appendix F.

a year from Terra, subject to agreement with Kemira. Appendix G assesses the sensitivity of Terra to losses in volume and shows that the available capacity at Ince was likely to have been an important factor constraining the ex-works prices of CO_2 at both Terra plants.

10.46 The parties told us that the JV would be constrained by the existing contract between Kemira and Air Liquide. They also told us that the JV would have no incentive to reduce the output of CO_2 at Ince as sales of raw CO_2 formed an important contribution to the fixed costs of operating the Ince plant.

10.47 We acknowledge that sales of raw CO_2 from Ince are an important contribution to the fixed costs of operating the Ince facility, and that Kemira as a separate entity would have no incentive to restrict output. However, we consider that the incentives on the JV would be different from those which faced Kemira as a separate entity. Under current arrangements, an increase in CO_2 output at Ince would have resulted in increased profits for Kemira. However, the JV would seek to maximize the profitability of its CO_2 business as a whole and so would have regard to any potential sales losses at Billingham and Severnside that may result from an increase in output at Ince.

10.48 Current contracts allow Terra to seek increases in its CO_2 prices at Billingham and Severnside or to terminate contracts by [✂]. Kemira could seek to increase its prices at Ince for raw CO_2 by [✂].

Potential competition

10.49 We also considered whether the JV would remove a source of potential competition through the changed incentives on the JV to agree to install additional liquefaction capacity at Ince to capture some of the CO_2 now vented.

10.50 Ince is one of only two existing CO_2 production sites where additional liquefaction plant may be installed. However, as discussed in paragraphs 10.62 and 10.63, we consider that, at the current level, or a slightly higher level, of prices for liquid CO_2, it would be unprofitable to build a liquefaction plant. Therefore we do not consider that the possibility that an additional liquefaction plant may be installed at Ince is currently a significant constraint on the behaviour of Terra.

Potential plant closures

10.51 Some third parties were concerned that plant closures may occur as a result of the merger. However, we consider that, as CO_2 production is a relatively small part of the parties' respective businesses, representing [✂] per cent of Terra's turnover and [✂] per cent of Kemira's turnover, any decisions about plant closures are unlikely to be made on the basis of the effect of the merger on the supply of CO_2.

Other competitive constraints

Entry and expansion

10.52 There are three potential sources for distributors seeking to access additional supplies of CO_2. First, as discussed in paragraph 10.32, it is possible that additional CO_2 could be imported by setting up specialist shipping and terminal facilities. Secondly, existing sources of CO_2 could be exploited by installing additional capture and liquefaction equipment. Finally, new entry could occur through the installation of

capture and liquefaction equipment at a number of bioethanol plants under construction, or which may be constructed in the future.

- *Additional imports*

10.53 As discussed in paragraph 10.32, setting up the necessary infrastructure to import CO_2 would require significant investment; we therefore do not consider that, at the current level, or a slightly higher level, of prices for liquid CO_2, distributors would set up import facilities.

- *Expansion using existing sources of raw CO_2 suitable for liquefaction*

10.54 There would appear to be little prospect for further expansion by the parties' existing UK competitors. The addition of liquefaction capacity at [✂] would only be possible if there was sufficient CO_2 being vented. [✂] told us that they did not vent significant quantities of CO_2 and that the capacity limits outlined in Table 20 represented their maximum possible output.

10.55 BOC could install a liquefaction plant at its hydrogen plant at Teesside. [✂]

10.56 Terra told us that it estimated that a 130-tonne-per-day liquefaction plant, which would produce 45,000 tonnes a year, would cost approximately £4 million. It estimated that there would be no significant exit costs and that payback of the initial investment could be achieved within four years. However, we consider that the return on investment would depend on prevailing market prices for CO_2, and the level of capacity utilization at the plant, and that there is no guarantee of such a rapid return.

- *Entry by bioethanol producers*

10.57 The parties told us that new entry was expected by a number of planned bioethanol projects. European policies aiming to reduce the use of fossil fuels are the driver behind such plans: in 2003 the European Commission issued a directive which set a target of 5.75 per cent of transport fuels by energy content to come from biofuels (including, but not limited to, bioethanol) by 2010.

10.58 The parties told us that raw CO_2 would be produced as a by-product of the fermentation process at these plants and would therefore be available for liquefaction into liquid CO_2. They identified eight bioethanol projects planned by six companies. They estimated that these projects would result in 1.2 million tonnes a year of additional raw CO_2 capacity.

10.59 We contacted those bioethanol producers which, to our knowledge, are most advanced in their plans: [✂]. None of these producers currently has firm plans to begin liquid CO_2 production.

10.60 Of those we spoke to, two are currently building bioethanol facilities, one is raising finance and one is in the project planning stage. Although all companies have some interest in liquefying CO_2, only two ([✂]) have explored the commercial prospects of this opportunity. [✂]

10.61 In addition to prospective bioethanol producers, we also spoke to the parties' main customers. Air Liquide and BOC did not consider it likely that there would be significant new entry through bioethanol production and [✂].

10.62 The CO_2 distributors we talked to confirmed that although they were seriously considering bioethanol production as a potential source of liquid CO_2, there were a number of hurdles which would constrain the commercial development of liquid CO_2 from bioethanol:

(a) The purity of CO_2 produced as a by-product of fermentation is lower than that produced from ammonia or hydrogen production leading to higher costs of purification. The raw CO_2 recovered from ammonia and hydrogen production is over 99 per cent pure. By way of example, we have been told that raw CO_2 recovered from bioethanol plants is 98.5 per cent.[55]

(b) There are currently some uncertainties regarding the economic viability of the bioethanol plants, both in the short term (some still have not secured funding) and the long term. To justify investing in liquefaction, [✂] said that it would need a guarantee of 10 to 15 years of operation. It is currently unclear whether bioethanol producers would be able to provide such guarantees. The viability of bioethanol production will also be affected by government incentives and the tax treatment of bioethanol which are yet to be finalized.

(c) We were told that several of the proposed bioethanol plants are unsuitably located for the needs of CO_2 distributors, being relatively far from the areas of demand and thus suffering a transport cost disadvantage. [✂]

10.63 Additional imports, new liquefaction capacity at existing sites or new liquefaction capacity at bioethanol plants cannot be excluded. However, we do not consider that new entry or expansion would be likely at or near to current prices for liquid CO_2. Demand for CO_2 has been falling and there is no shortage of liquefaction capacity in the UK. In recent years wholesale prices have fallen slightly. We therefore consider that the JV would not be constrained by the potential for new entry or expansion.

Buyer power

10.64 There are few distributors of CO_2 and they tend to be better informed about the end-uses of CO_2 and the retail market than the producers, for whom CO_2 is a by-product. Nevertheless there appear to be few alternatives to sourcing from the parties as the parties' competitors are small and capacity constrained. It therefore appears unlikely that the distributors would be able to resist any adverse effects of a loss in rivalry by exercising countervailing buyer power.

Unilateral and coordinated effects

Unilateral effects

10.65 The parties are by far the largest producers of raw CO_2 suitable and available for liquefaction within the UK, and the proposed JV would gain a large share of supply and a significant increment. We expect that the JV, as contracts come up for renewal, would have the opportunity to raise its ex-works prices for liquid CO_2 at Billingham and Severnside. At Ince the JV could use the threat of termination of the contract to raise the price of raw CO_2 or to curtail output in order to maximize sales from its other plants. The parties' existing competitors within the UK are capacity constrained in the absence of significant investment and their ability to react to increased prices by raising output is limited. As a result, the loss of rivalry between

[55]Source: Toromont Process Systems, a North American supplier of CO_2 recovery plants.

the parties may also have the potential to result in an increase in ex-works prices at other sites.

10.66 Whilst it is feasible that new liquefaction capacity may be added at future bioethanol plants, or [✂], we consider that the costs of entry are such that there would need to be a significant increase in ex-works prices of CO_2 in order to make the addition of new liquefaction capacity profitable. We therefore do not consider that the JV would be constrained by the potential for entry or expansion. In addition, as distributors would have few alternatives to the JV, we do not consider that the JV would be constrained by buyer power.

Coordinated effects

10.67 CC guidelines recognize that coordinated effects can arise as the result of a merger and that tacit collusion between firms which would be expected to be competing may increase as the result of a merger.[56] The guidelines describe three conditions that need to be in place for such behaviour to occur and be sustainable through time. First, the market has to be sufficiently concentrated for companies within that market to be aware of the behaviour of their competitors and for any significant deviation from prevailing behaviour by a company to be observed by other companies. This behaviour is termed interdependence. Second, it must be clear that it would be costly for any company to deviate from the prevailing behaviour.[57] Third, the external constraints on the companies engaged in tacit collusion must be weak so that tacit collusion will not be disrupted by new entry or by the expansion of fringe companies.

10.68 [✂] told us that it believed that the market was sufficiently concentrated for companies to be aware of each other's behaviour, and that the first condition necessary for coordination was met. [✂] told us that at the wholesale level there were only three large companies supplying liquid CO_2 to distributors. [✂] also believed that the market was sufficiently transparent to lend itself to tacit coordination because the market was concentrated; the JV would have knowledge of output levels; capacity levels and operating costs as the operator of the Ince plant; and furthermore [✂] also told us that Air Liquide would be well placed to estimate Terra's wholesale margins as it was a wholesale supplier to Terra itself.

10.69 We agree that the market for the supply of CO_2 to distributors is concentrated. However, it is not clear that the market is sufficiently transparent for companies to be aware of each other's behaviour to a sufficient degree for coordinated effects to prevail.[58] In addition, we found that contracts for the supply of CO_2 to distributors are negotiated infrequently, with contracts typically offering a fixed price [✂]. This infrequent price setting will limit the interdependence of the companies in the market, as a price cut, due to restrictions in contracts, would not necessarily lead to an identifiable drop in the sales of rival companies. It is therefore not immediately clear that the JV, or any other company, may be able to detect deviation from the prevailing price. We therefore consider that there is insufficient evidence to conclude that the first condition for coordination is met.

10.70 [✂] told us that it also believed that it would be costly for a company to deviate from prevailing behaviour and that the second condition for coordination was met. In support of this, it noted that the JV would have spare capacity at its Billingham and Severnside plants and would be able to increase output rapidly. [✂] also noted that

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[56] *CC2,* pp30–31.
[57] For example, because there would be retaliatory price cuts by rival firms.
[58] [✂]

Air Liquide, by virtue of its control of supplies of liquid CO_2 from the remaining independent UK suppliers, could also respond by cutting prices in the event of deviation by the JV.

10.71 However, even if companies were able to detect deviation successfully, it is not clear that it would be costly for individual companies to deviate from prevailing behaviour. The prevalence of relatively long supply contracts with distributors would limit the scope for retaliatory behaviour. As contracts are negotiated for [✂], retaliatory behaviour could only occur as contracts come up for renewal. In addition, there is no prospect that retaliation (for example, by rapidly increasing output) would induce the deviating company to revert to coordinated behaviour, since the deviating company would be locked into a relatively long supply contract. Finally, while the JV, and to a lesser extent Air Liquide, may have the ability to retaliate by increasing output, it is unlikely that Yara could do so effectively, because of the high cost of increasing imports. We therefore consider that there is insufficient evidence that the second condition necessary for coordination is met.

10.72 Finally, as regards the third condition, we found that the competitive constraint from imports or from new entry was weak. In addition, we found that the scope for distributors to exercise buyer power was relatively weak. We therefore agree that the third condition necessary for coordinated effects is met.

Conclusion on CO_2

10.73 We consider it unlikely that the first or second conditions necessary for coordinated effects, set out in paragraph 10.67, are met. For coordinated effects to occur as a result of the merger, all three conditions need to be in place. We therefore conclude that there is insufficient evidence that the proposed JV will result in coordinated effects in the market for the supply of CO_2 in the UK.

10.74 We conclude that the formation of the JV may be expected to result in an SLC in the market for the supply of CO_2 to distributors in the UK as a result of unilateral effects. In the absence of remedies, this is expected to result in higher ex-works prices for CO_2 in the UK.

11. Nitric acid

Background

11.1 Nitric acid is highly corrosive and is a very powerful oxidizing agent.

11.2 Demand for nitric acid comes from a variety of sectors:

- 58 to 60 per cent nitric acid is used in a range of industries, such as metal treatment, chemical manufacturing, and the manufacture of catalysts and cleaning agents;
- 69 to 70 per cent nitric acid is used in polyurethane and explosives production; and
- 98 per cent nitric acid is used in a limited number of applications such as nitrocellulose manufacture, explosive and fuel additives.

11.3 The sales of 69 to 70 per cent nitric acid are highly concentrated, with two customers [✂].

11.4 Nitric acid is to a large extent sold directly to customers by the parties, but a sizeable proportion of 58 to 60 per cent nitric acid and 69 to 70 per cent nitric acid are sold via process chemical distributors. These distributors typically 'break bulk' at their depots and supply smaller packages of process chemicals to their customers. They also create their own products, eg blending nitric acid with another acid such as phosphoric acid, and sell this mixture. As shown in Table 22, there are four main distributors of nitric acid.

TABLE 22 **Sales of nitric acid to distributors, 2005**

	Total sale volume 2005	*Proportion sold to distributors %*	*Distributors*
58 to 60% nitric acid	[✂]		Albion, Univar, Tennants, Gower Chemicals
69 to 70% nitric acid			Albion

Source: Parties' main submission.

11.5 Nitric acid is delivered to customers and distributors in bulk road tankers.

11.6 The parties told us that they competed in the supply of 58 to 60 per cent nitric acid, but that the overlaps between them in 69 to 70 per cent nitric acid and 98 per cent nitric acid are minimal.

Market definition

11.7 The parties' view was that there were separate markets for the supply of each concentration of nitric acid. In the supply of 58 to 60 per cent and the supply of 69 to 70 per cent nitric acid, the parties stated that the market was no wider than the UK. They acknowledged that transport costs accounted for a considerable proportion of the total costs that would be involved in supplying imported product into the UK.

Product market

11.8 The central question with regard to the relevant product market is the degree of demand- and supply-side substitutability between the different concentrations of nitric acid.

11.9 The parties told us that there was no prospect of supply-side substitution between the different concentrations of nitric acid. Terra can produce 58 to 60 per cent nitric acid and 69 to 70 per cent nitric acid using its current facilities. However, Kemira can produce only 58 to 60 per cent nitric acid using the facility at Ince. Switching between different concentrations would require changes to existing plant and machinery.

11.10 We used a customer questionnaire to gather evidence regarding demand-side substitution. We received responses from eight Terra customers, customers representing 88.5 per cent of non-captive sales in 2006. We also received responses from four Kemira customers, representing 36.5 per cent of Kemira sales in 2006.

11.11 On the demand side, customer responses were very clear. None of the parties' customers considered that in the event of a 5 per cent price rise there would be any realistic substitutes for nitric acid.

11.12 The picture within each concentration is less clear-cut. With regard to 98 per cent acid, one customer currently purchases 69 per cent nitric acid from Terra and concentrates this to 98 per cent. A customer said that it could, as an alternative,

purchase 98 per cent nitric acid directly from Kemira in Belgium, which was outside the JV. However, it would be unlikely to do so in response to a 5 per cent increase in price because the specific plant involved in concentrating nitric acid was only viable if run at a high volume.

11.13 Customer responses in relation to 58 to 60 and 69 to 70 per cent nitric acid indicate a greater degree of substitutability. Four customers indicated that there was some substitutability between 58 to 60 and 69 to 70 per cent nitric acid. These customers, in aggregate, represented 54 per cent of the non-captive customer sample.

11.14 One customer said that different grades of nitric acid were substitutable. If the price of one particular concentration of nitric acid increased by 5 per cent, it said that it would consider changing to another concentration. It would take only a few months to make the change. There would be some administrative costs through changing the recipes, and some trialling costs to prove the new materials, but these would not be significant. The main cost change would relate to any consequent changes in the volumes of nitric acid arising as a result of the change in concentration. The customer did not have a reliable estimate of these costs but did not believe that they would be material.

11.15 Another customer said that it would switch to the nearest concentration of nitric acid if the price of 60 per cent concentration nitric acid increased by 5 per cent. This would require some changes to a number of features of its plant. This customer also believed that these would not take long to implement. It had no cost estimate.

11.16 Another said that it would prefer to stick with 60 per cent nitric acid as the fume risk was lower. However, it could swap from 60 to 69 per cent concentration without affecting its COMAH safety certificate. It would not be able to switch to any higher concentration as this would present a fume risk and would require a significant change to its plant.

11.17 A distributor ([✂]) said that it could take in everything at 70 per cent concentration and dilute down. It had dilution equipment at several of its depots. It believed that most customers could do this. However, it did not think that customers could easily reconcentrate 58 to 60 per cent nitric acid back to 69 to 70 per cent.

11.18 It therefore seems that for some customers at least there is some substitutability between the different concentrations of nitric acid. The proportion of customers that would switch in response to a 5 per cent increase in price is unclear. Some customers appear to be able to accommodate different concentrations within their manufacturing processes. Others may be able to substitute 69 to 70 per cent acid for 58 to 60 per cent acid by dilution of the more concentrated amount, but may not be able to substitute 58 to 60 per cent nitric acid for a higher concentration.

11.19 Given the ability of some customers and large distributors to dilute nitric acid, a hypothetical monopolist of 58 to 60 per cent nitric acid may not be able profitably to impose a 5 per cent increase in price, as sales would be lost to 69 to 70 per cent nitric acid. However, as fewer customers appear to be able to substitute 69 to 70 per cent nitric acid for 58 to 60 per cent nitric acid, a hypothetical monopolist in the supply of 69 to 70 per cent nitric acid may be more likely to profitably impose a 5 per cent increase in price.

11.20 As there is some uncertainty as to the proportion of customers that would switch between different concentrations in response to a 5 per cent increase in price, we have taken a cautious approach and considered each concentration of nitric acid

separately. We discuss in paragraph 11.34 whether a different market definition would affect our findings.

Geographic market

11.21 The parties told us that the geographic market with respect to nitric acids of 58 to 60 and 69 to 70 per cent concentration was no wider than the UK.

11.22 Customer responses generally confirm this view. One customer said that it would seek alternatives, as it had plants in Northern Europe that used large quantities of nitric acid. It would look to tie itself to the suppliers from those plants in the event of a 5 per cent increase in price within the UK. However, the remainder of respondents did not consider that a 5 per cent increase in price would be sufficient to justify switching to a supplier outside the UK.

11.23 The majority of the 98 per cent nitric acid used within the UK is imported from Kemira's site in Belgium. Only a very small volume (approximately [✂] tonnes or [✂] per cent of UK consumption) is produced within the UK by another manufacturer. We therefore consider that the relevant geographic market for 98 per cent nitric acid is wider than the UK and comprises the supply of 98 per cent nitric acid in Northern Europe.

Conclusion on market definition

11.24 We conclude that the relevant markets are as follows:

- the supply of 58 to 60 per cent nitric acid in the UK;
- the supply of 69 to 70 per cent nitric acid in the UK; and
- the supply of 98 per cent nitric acid in northern Europe.

Competition

11.25 Third party responses indicate that formal contracts for the supply of nitric acid to most customers are rare. Where contracts do exist, they appear to be renegotiated at least annually.

11.26 Switching supplier is relatively rare. However, most customers said that there were few impediments to switching and the threat of switching could be just as effective as actual switching as a constraint on pricing so long as that threat was credible.

11.27 Given that the threat of switching appears credible, we would not necessarily expect to see a great deal of switching in practice.

The effects of the merger

The impact of the merger on rivalry

11.28 Six of the eight non-captive customers who responded to our questionnaire were concerned regarding the proposed JV. They were concerned primarily about a loss of competition, security of supply and potential price rises. Tables 23 and 24 show the parties' market shares in the supply of 58 to 60 and 69 to 70 per cent nitric acid in the UK.

TABLE 23 **Shares of supply of 58 to 60 per cent nitric acid in the UK, 2005**

	Dry tonnes	*Share %*
Terra	[✂]	[✂]
Kemira		
Combined		*100.0*
Total		100.0

Source: The parties.

TABLE 24 **Shares of supply of 69 to 70 per cent nitric acid in the UK, 2005**

	Dry tonnes	*Share %*
Terra*	[✂]	[✂]
Kemira		
Combined		*100.0*
Total		100.0

Source: The parties.

*Terra sales are net of sales to [✂].

11.29 As the tables show, the proposed JV would result in a significant loss in rivalry.

11.30 In particular, the main area of overlap between the parties is in the supply of 58 to 60 per cent nitric acid. The proposed JV would result in a single producer. The proposed merger would result in a significant loss of rivalry in this market.

11.31 With respect to 69 to 70 per cent nitric acid, the overlap between the parties is minimal. Kemira has a market share of less than 1 per cent. Kemira does not produce 69 to 70 per cent nitric acid in the UK and the parties told us that it did not have the capability to do so. The small volume of 69 to 70 per cent nitric acid sold by Kemira in the UK is imported from Kemira's plant in Belgium and sold to [✂]. We do not consider that Kemira is at present a significant competitive constraint on Terra in the supply of 69 to 70 per cent nitric acid pre-merger.

11.32 In addition, Terra's largest customer for 69 to 70 per cent nitric acid is [✂].[59,60]

11.33 The JV would have no ability to produce 98 per cent nitric acid. As discussed above, one manufacturer supplies Terra with approximately [✂] tonnes of 98 per cent nitric acid under a toll processing arrangement. Kemira GrowHow UK imports modest volumes ([✂] tonnes a year) from Kemira in Belgium. The vast majority of 98 per cent nitric acid used within the UK ([✂] tonnes a year or [✂] per cent of UK consumption) is imported from Kemira direct. However, Kemira's European operations, and the plant in Belgium, will remain outside the JV. We do not consider that the small volume produced by the UK manufacturer and sold by Terra is a constraint on the pricing or behaviour of Kemira. We therefore do not expect that the proposed JV will disadvantage customers in the supply of 98 per cent nitric acid in the UK.

11.34 Even if the market had been defined to include all concentrations of nitric acid, the JV would hold a monopoly position, but there would be a greater loss of competition for customers that purchase 58 to 60 per cent nitric acid.

[59] [✂]
[60] In the remainder of this section, where we refer to customers, we are referring to [✂].

Other competitive constraints

Entry and expansion

11.35 Nitric acid is a by-product of fertilizer manufacture. We have seen no evidence of production by any other means. It appears unlikely that there would be new entry in the supply of fertilizer in the UK. It is not expected, therefore, that there will be any new entry in the supply of nitric acid within the UK for the foreseeable future.

Buyer power

11.36 The vast majority of the parties' non-captive customers for 58 to 60 per cent nitric acid did not consider that they would enjoy buyer power and we received no evidence to the contrary.

Conclusion

11.37 The JV would hold a monopoly position in the supply of 58 to 60 per cent nitric acid within the UK. There would appear to be little prospect for imports, at least for a price rise of up to 5 per cent, due to the significant transport costs involved. Finally there would appear to be little prospect of new entry in the supply of 58 to 60 per cent nitric acid and customers of the JV would be unlikely to enjoy buyer power.

11.38 We therefore conclude that the formation of the JV may be expected to result in an SLC in the supply of 58 to 60 per cent nitric acid. In the absence of remedies, this would be expected to result in higher ex-works prices for 58 to 60 per cent nitric acid in the UK.

11.39 We conclude that the formation of the JV may not be expected to result in an SLC in the markets for the supply of 69 to 70 per cent nitric acid and 98 per cent nitric acid.

12. Aqueous ammonia

Background

12.1 Aqueous ammonia is used in a wide range of applications, such as flue gas treatment, effluent treatment, animal feed processing (turning wheat straw into forage), food processing (eg for the production of yeast), metal treatment and at power stations (for reducing noxious emissions).

12.2 Process chemicals are to a large extent sold directly to customers by the parties, but a sizeable proportion of aqueous ammonia is sold via process chemical distributors. These distributors typically 'break bulk' at their depots and supply smaller packages of process chemicals to their customers. They also create their own products, eg diluting 33 per cent aqueous ammonia to lower concentration to meet customer demand. There are seven main distributors of the above process chemicals produced by the parties in the UK. Distributors purchase 33 per cent concentrated aqueous ammonia from the parties for packing in various size containers for resale and to produce lower concentrations. [✂]

12.3 The parties told us that aqueous ammonia could be shipped using standard chemical tankers and storage terminal capacity was available in the UK in existing chemical storage tanks.

Market definition

Product market

12.4 The parties believed that the relevant market for the supply of aqueous ammonia was wider than the UK. They said that imports of aqueous ammonia would be possible if the price of domestic aqueous ammonia increased materially.

12.5 The parties' customers confirmed the parties' view that there were no realistic alternatives to aqueous ammonia.

12.6 We have received responses from 11 aqueous ammonia customers. These customers accounted for 53 per cent of Terra's sales by value and 51 per cent of Kemira's sales by value.

Geographic market

12.7 Despite the parties' view that imports of aqueous ammonia were possible, third parties in general did not consider it likely that they would switch to imports in the event of a 5 per cent increase in price.

12.8 [✂] largest customer said that it had not sourced from outside the UK in the past five years, had never threatened to, and if the price of aqueous ammonia in the UK increased by 5 per cent it would absorb the increase.

12.9 [✂] largest customer for aqueous ammonia said that [✂] it could potentially switch to imports. However, other large customers said that they would absorb a price rise in the UK.

Conclusion on market definition

12.10 We conclude that the relevant market is the supply of aqueous ammonia within the UK.

Competition

12.11 Third party responses indicate that where formal contracts for the supply of aqueous ammonia exist, notice terms in excess of 12 months are rare. There appear to be no impediments to switching supplier. For example, one customer said that switching costs were negligible and that timing would depend on the validation process. This was confirmed by other third parties.

The effects of the merger

The impact of the merger on rivalry

12.12 A number of the parties' main customers were concerned regarding the proposed JV. For example, [✂] was concerned regarding future availability and pricing.

12.13 The parties' shares of supply are listed in Table 25. As the table shows, after the merger the parties will hold a very large market share and the JV will result in a significant increment in market share.

TABLE 25 **Shares of supply for aqueous ammonia in the UK, 2005**

Supplier	*Dry tonnes*	*Share %*
Terra Kemira	[✂]	[✂]
Combined		
[✂]		
Total		100

Source: The parties.

12.14 As the table shows, based on the market definition outlined above, the JV would result in a significant loss in rivalry and post-merger the JV would enjoy a very high market share. The parties included their two largest customers as producers as they dilute higher concentrations of aqueous ammonia for onward sale. [✂]

12.15 As neither of these two customers has access to supplies of ammonia independent of the parties, the competitive constraint they impose is more limited than market shares may imply. If they are considered as customers rather than competitors, the JV will have a monopoly position post-merger. On either basis the JV will result in a significant loss in rivalry.

Other competitive constraints

Entry and expansion

12.16 Aqueous ammonia is a by-product of fertilizer manufacture. We have seen no evidence of production by any other means, other than by dilution of anhydrous ammonia, which is also a by-product of fertilizer manufacture. As discussed in Section 7, it appears unlikely that there will be new entry in the supply of fertilizer in the UK. Therefore it is not expected that there will be new entry in the supply of aqueous ammonia within the UK for the foreseeable future.

Buyer power

12.17 None of the customer responses received has indicated that any customers considered that they would be able to resist any price rise post-merger by exercising buyer power. The parties will enjoy a monopoly or near monopoly position post-merger. There is therefore little or no prospect that the JV would be constrained by the buyer power of its customers post-merger.

Conclusion

12.18 Although some customers have raised the possibility that there could possibly be imports of aqueous ammonia, the majority did not consider this likely, at least in response to a price rise of up to 5 per cent. There would appear to be little prospect of new entry in the supply of aqueous ammonia. Finally, customers of the JV would be unlikely to enjoy buyer power.

12.19 We conclude that the formation of the JV may be expected to result in an SLC in the market for the supply of aqueous ammonia to customers in the UK. In the absence of remedies, this would be expected to result in higher ex-works prices for aqueous ammonia in the UK.

13. Anhydrous ammonia

13.1 The most important single use of anhydrous ammonia is in the production of nitric acid, which is a key intermediate in AN, nylon production and polyurethane production. Ammonia is also a building block for other chemicals (eg acrylonitrite) used in nylon and plastics production. It is also a component of melamine, which is used in adhesives, laminates, paper and textiles, and surface coatings. Ammonia is also converted into other intermediate chemicals to make dyes, urethane foams and acrylic plastics. Some ammonia is also used as a refrigerant gas, mainly in large, commercial or industrial refrigeration systems.

13.2 The parties produce a standard grade and a premium grade of anhydrous ammonia. The premium grade has a lower water content and is used in the manufacture of pharmaceuticals, for chemicals that may enter the food chain, and for certain refrigeration purposes. The premium grade is produced in larger quantities by Terra, as it has specialist equipment, whilst Kemira can only tap off a small quantity when its ammonia plant is operating normally.

13.3 Terra sells about [✂].

13.4 In 2005, other customers bought [✂] tonnes of anhydrous ammonia, of which [✂] tonnes are produced by Terra and [✂] tonnes by Kemira. The product was typically sold directly to customers and distributors. Only [✂] tonnes were sold to a distributor for on-sale in drums or cylinders.

13.5 Both the parties have substantial storage capacity for standard grade anhydrous ammonia: Terra's storage capacity is [✂] tonnes, and Kemira's is [✂] tonnes.

13.6 Terra has import facilities in Billingham, which it uses to bring anhydrous ammonia into the UK when there is a production shortfall. Due to the plant shutdowns described in paragraph 2.20, Terra imported [✂] tonnes in 2005 and [✂] tonnes in 2006. Terra told us that this product was bought to a worldwide specification which was suitable for supply to all its customers, although Kemira told us that this could not be guaranteed.

13.7 Kemira can also import anhydrous ammonia by ship ([✂]-tonne shipments) to the Ince site through a jetty facility on the nearby Manchester Canal. This is transported to a [✂]-tonne storage tank at Ince via a pipeline.

Market definition

Product market

13.8 We received responses to our questionnaire from eight anhydrous ammonia customers. These customers accounted for 45 per cent of Terra external sales by value and 80 per cent of Kemira's sales by value. They told us that there were no substitutes for anhydrous ammonia.

13.9 The parties' view was that premium grade and standard grade anhydrous ammonia were not substitutable on the demand side. However, the parties considered that on the supply side producers could switch between grades relatively easily.

13.10 We find this evidence of supply-side substitution persuasive and consider that the relevant market is for anhydrous ammonia.

Geographic market

13.11 The parties' customers told us that it was not economically viable to import anhydrous ammonia into the UK. For example, one customer told us that, as a hazardous chemical, anhydrous ammonia was not permitted in the Channel Tunnel or on normal shipping. Anhydrous ammonia had to be imported by bulk pressurized vessels into specialist terminals. The only suitable terminal that the customer was aware of was at Teesport and was operated by Terra (paragraph 2.12).

13.12 No customer responses received with respect to anhydrous ammonia indicated that imports were likely in the event of a 5 per cent increase in price by a hypothetical monopolist in the supply of anhydrous ammonia within the UK.

Conclusion on market definition

13.13 We conclude that the relevant market is the supply of anhydrous ammonia within the UK.

Competition

13.14 Third-party responses indicate that contracts for the supply of anhydrous ammonia to non-captive customers are rare. There appear to be no impediments to switching supplier. For example, one customer has regularly switched between the parties in the past and it told us that it could switch suppliers 'in minutes'. This was confirmed by other third parties.

13.15 However, another customer said that it had not sourced from Kemira recently because Kemira prices tended to be uncompetitive when compared with those offered by Terra. It also told us that Kemira, though more expensive, was its only alternative source of supply and that it obtained quotes from Kemira when negotiating with Terra.

13.16 The parties noted that a large proportion ([✂] per cent) of Terra's sales was to [✂] 'captive customers'.[61] Kemira was not a realistic alternative to Terra for these customers as they were supplied by a fixed pipeline from Terra's Billingham plant. Therefore the merger does not result in a loss of rivalry in relation to these customers.

The effects of the merger

The impact of the merger on rivalry

13.17 The parties' main customers had concerns about the proposed JV primarily relating to loss of competition, security of supply and potential price rises.

13.18 The parties' shares of supply are listed in Table 26. As the table shows, post-merger the parties will hold a monopoly position and the JV will result in a significant increment.

[61] [✂]

TABLE 26 **Shares of supply for anhydrous ammonia in the UK, 2005**

Supplier	*Dry tonnes*	*Share*
Premium grade		
Terra	[✂]	[✂]
Kemira		
Combined		*100.0*
Total		100.0
Standard grade		
Terra	[✂]	[✂]
Kemira		
Combined		*100.0*
Total		100.0
All grades		
Terra	[✂]	[✂]
Kemira		
Combined		*100.0*
Total		100.0

Source: The parties.

13.19 As the table shows, based on the market definition outlined above, the JV would result in a significant loss of rivalry and enjoy a monopoly position. One customer told us that Kemira had been uncompetitive in the past; but the majority of customers considered Kemira to be a close competitor to Terra.

Other competitive constraints

Entry and expansion

13.20 Anhydrous ammonia is a by-product of fertilizer manufacture. We have seen no evidence of production by any other means. It appears unlikely that there would be new entry in the supply of fertilizer in the UK. Therefore it is not expected that there will be new entry in the supply of anhydrous ammonia within the UK for the foreseeable future.

Buyer power

13.21 One customer considered that it might have some buyer power pre-merger, but because the JV would result in a monopoly position, this would eliminate any buyer power that the company might currently enjoy. As the merger appears to confer upon the JV a monopoly position in the supply of anhydrous ammonia in the UK, there appears to be no prospect of customers exercising any countervailing buyer power.

Pipeline customers

13.22 As noted in paragraph 13.16, the parties have [✂] large customers who are supplied with anhydrous ammonia through a pipeline. The parties submitted that for these customers there was no realistic alternative to Terra because the costs of transporting such large volumes of anhydrous ammonia, other than via existing pipelines, would be prohibitive. The relationship between Terra and its pipeline customers is one of mutual dependence, because Terra relies on these customers for [✂] per cent of its sales of anhydrous ammonia and because the pipeline customers rely on Terra as their only viable source of supply.

13.23 [✂]

13.24 [✂], but that this would cost between £3 million and £5 million. It would not be feasible for it to source from [✂].

13.25 We conclude that pipeline customers are unaffected by the proposed JV.

Conclusion

13.26 We conclude that the proposed merger will result in a loss of rivalry between the parties in the supply of anhydrous ammonia to non-pipeline customers. There would appear to be little prospect of imports, at least for a price rise of up to 5 per cent, due to the costs associated with importing a hazardous chemical that requires specialist equipment. Finally there would appear to be little prospect of new entry in the supply of anhydrous ammonia and customers of the JV would be unlikely to enjoy buyer power.

13.27 We therefore conclude that the formation of the JV may be expected to result in an SLC in the supply of anhydrous ammonia in the UK. In the absence of remedies, this would be expected to result in higher ex-works prices for anhydrous ammonia in the UK.

14. Findings

14.1 We conclude that the anticipated JV between Kemira and Terra constitutes a relevant merger situation.

14.2 We also conclude that the anticipated JV between Kemira and Terra may be expected to result in SLCs in each of the markets for CO_2, nitric acid of 58 to 60 per cent concentration, aqueous ammonia and anhydrous ammonia, in the UK.

14.3 We conclude that the anticipated JV between Kemira and Terra may not be expected to result in an SLC in the markets for straight N fertilizers, for complex fertilizers and for the supply of AN to non-agricultural customers.

15. Remedies

15.1 Having determined that the anticipated JV between Kemira and Terra may be expected to result in SLCs in each of the markets for CO_2, nitric acid of 58 to 60 per cent concentration, aqueous ammonia and anhydrous ammonia in the UK, we now turn to remedies.

15.2 Our Notice of possible remedies published on 4 May 2007[62] sought comments on a divestiture remedy consisting of the lease of Kemira's out-loading facilities at Ince for anhydrous ammonia, aqueous ammonia and nitric acid of 58 to 60 per cent concentration (referred to as the relevant process chemicals) and the sale of other assets pertinent to the sale and distribution of those relevant process chemicals. In relation to CO_2, we sought views on the effectiveness and practicality of a remedy centred on the contract between Kemira and Air Liquide. We indicated that price control remedies were unlikely to be effective in addressing any of the SLCs found. We noted that prohibition of the JV would be an effective remedy. We received comments on this notice and subsequently in the process from Kemira, Terra and a number of third parties.

[62] www.competition-commission.org.uk/inquiries/ref2007/kemira/pdf/notice_of_possible_remedies.pdf.

15.3 The divestiture remedy is considered in paragraphs 15.4 to 15.59. In the course of the inquiry Kemira and Terra proposed a price control mechanism for the relevant process chemicals, to which we gave careful consideration paragraphs 15.60 to 15.67. Remedy options relating to CO_2 are discussed in paragraphs 15.68 to 15.101.

Divestiture remedy for process chemicals

15.4 We first considered a divestiture remedy for the relevant process chemicals only.[63] In line with the CC's guidance,[64] we considered what would constitute an appropriate divestiture package, the criteria for a suitable purchaser and whether there were likely to be suitable purchasers and what would be an effective divestiture process. We considered each of these in turn.

Constitution of an effective divestiture package

15.5 The CC's guidance states:

> The Commission's starting point will be to choose the remedial action that will restore the competition that has been, or is expected to be, lessened as a result of the merger. ... remedies that aim to restore all or part of the status quo ante market structure are likely to be a direct way of addressing the adverse effects.[65]
>
> In defining a divestiture package that will satisfactorily address the anticipated SLC, the CC will normally seek to identify the smallest operating unit of a business (eg a subsidiary or a division) that contains all the relevant operations pertinent to the area of competitive overlap and that can compete successfully on a stand-alone basis. ... The CC will generally prefer divestiture of an existing business that can compete on a stand-alone basis independently of the merger parties, to divestiture of part of an operating unit or collection of assets. This is because divestiture of such a business is less likely to be subject to purchaser and composition risk.[66]

Description of the operations to be divested

15.6 The parties put forward a divestiture remedy consisting of the following core elements, which together constitute the Divestiture Package:

(a) a long-term lease of the relevant process chemicals out-loading facilities and storage tanks at the Ince plant, which would be operated by the JV on the purchaser's behalf;

(b) long-term supply agreements with the JV for nitric acid of 60 per cent concentration, anhydrous ammonia, and aqueous ammonia, under which the purchaser would have the ability to vary the volume of product it would buy from the JV;

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[63]This remedy does not address the SLC relating to CO_2. Remedies for that SLC are discussed in paragraphs 15.68 to 15.101.
[64]*Application of divestiture remedies in merger inquiries: Competition Commission Guidelines, CC8*, December 2004, paragraph 2.2.
[65]*CC2*, paragraph 4.23.
[66]*CC8*, paragraphs 3.1 and 3.3.

(c) customer lists and other records from the Ince plant relating to customers in the UK for nitric acid of 60 per cent concentration, anhydrous ammonia and aqueous ammonia;

(d) other relevant records, written materials and intellectual property rights;

(e) access to appropriate know-how;

(f) reasonable endeavours to transfer all existing contracts with customers and distributors for the supply of nitric acid of 60 per cent concentration, anhydrous ammonia and aqueous ammonia from the Ince plant;

(g) the contracts of employment of the business managers who are responsible for sales, marketing and customer technical support;

(h) a commitment for a period of two years not to solicit the personnel and customers transferred to the purchaser; and

(i) to the extent legally transferable, all UK governmental licences, permits, authorizations and registrations relating to the divestiture package.

15.7 The parties envisaged that the basis of prices paid for the products by the purchaser under the long-term supply agreements would comprise:

(a) a standing charge consisting of the purchaser's contribution to the fixed costs of operating the Ince plant, which would be payable regardless of the volumes purchased from the JV; and

(b) a variable cost element based on the price of natural gas and other variable costs.

15.8 Under the supply agreement, the purchaser of the Divestiture Package would have the ability to purchase whatever volumes of the relevant process chemicals it required subject to the plant capacity limits, without having to provide forecasts of the volumes that it planned to purchase, as logistical arrangements would be put in place to ensure that the tanks were always sufficiently full for outloading to take place.

15.9 The Divestiture Package proposed is a collection of assets rather than a stand-alone operation. This raises three questions: does the package contain all the elements pertinent to the area of competitive overlap, is the business separable and is the business viable in both the short and the long term? The question of viability raises the following issues:

(a) whether the Divestiture Package is of sufficient scale, ie whether the overall sales volume is sufficient and whether other products need to be added to the package;

(b) whether reliance on a small number of customers and the risk of losing them significantly increases the vulnerability of the Divestiture Package (hereafter referred to as customer risk);

(c) whether the pricing of the product makes the business particularly vulnerable to fluctuations in volume; and

(d) whether the possibility of future closure of the Ince plant should be addressed by the remedy.

Competitive overlap

15.10 All the potential purchasers of the Divestiture Package approached by the parties told us that all the elements necessary for the operation of the business had been included in the package.

15.11 Some process chemical customers were concerned that the package did not include production assets, that the remedy would not address the loss of competition in the production of the relevant process chemicals and that this could be expected to result in less efficient production and increased prices.

15.12 We consider that because the assets which produce the relevant process chemicals are primarily geared towards supplying the fertilizer market,[67] which is subject to normal competitive pressures, it can be expected that post-merger both parties will still have the incentive to improve the efficiency of these production assets.

Separability of the business

15.13 The proposed divestiture does not involve the disposal of a stand-alone business and would require the lease of assets and transfer of various contracts and information. However, in principle we consider that it should be possible to separate the operations.

15.14 After divestment, continuing links would necessarily remain between the purchaser and the JV, primarily due to the supply agreement but also due to the sharing of some assets, eg the nitric acid tank.

15.15 As noted in the CC's review of past merger remedies,[68] 'continuing entanglements and relationships' between the divesting party and the purchaser post-divestiture (eg where the divesting party supplies a key input to the purchaser) tend to increase the vulnerability of the purchaser and can dull the incentive to compete.

15.16 In this case, the supply agreement between the JV and the business will need to be robust and objective in order for the business to remain viable and competitive. Normally the interests of the supplier and its customers are aligned. However, where the supplier of the product is also a competitor of the purchaser, the supplier does not necessarily have an interest in the success of the purchaser, and this may affect its incentive to fulfil its obligations under the supply contract. Adequate protection would need to be put in place to deal with this issue.

Viability of the business

15.17 All the potential purchasers we talked to told us that in principle the Divestiture Package should be viable.

15.18 We considered the extent to which the viability of the business would be affected by issues of scale and scope, the risk of losing customers, the price to be paid to the JV by the purchaser for the relevant process chemicals and the potential closure of the Ince site.

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[67]Sales by the parties of aqueous ammonia, anhydrous ammonia and nitric acid of 58 to 60 per cent concentration represent less than £[✂] million. The combined sales of fertilizers by the parties in the UK were £[✂] million in 2006.
[68]www.competition-commission.org.uk/our_role/analysis/understanding_past_merger_remedies.pdf, January 2007.

- *Issues of scale and scope*

15.19 Kemira manufactures a range of chemicals at Ince, including AN liquor,[69] magnesium nitrate and demineralized water, which the main parties did not propose to include in the Divestiture Package, as we had not found an SLC in relation to these products. We considered whether any of these products should be added to the Divestiture Package to make it viable.

15.20 Research undertaken by the European Commission[70] has shown that where a divested package of assets does not include products which had previously been bought by customers as part of a bundle including the divested products, customers may decide to switch back to the seller of the business to continue to have access to the complementary products or services which have not been divested. We considered whether there was such a risk in this case.

15.21 Analysis provided by the parties showed that [✂] per cent of the Divestiture Package turnover was accounted for by customers who also bought other products from Kemira. The fact that customers who accounted for over [✂] per cent of the Divestiture Package turnover did not purchase other products from Kemira suggested that there was little risk that the exclusion of these other products from the package would affect the viability of the new business.[71] We noted that none of the potential purchasers identified the exclusion of these products from the Divestiture Package as an issue.

15.22 We conclude that it would not be necessary to widen the Divestiture Package to other products in order to make it viable.

- *Customer risk*[72]

15.23 The proposed Divestiture Package entails a significant customer risk, [✂] of its sales are shared between ten customers. One customer ([✂]) accounts for [✂] per cent of the sales of premium anhydrous ammonia and another customer ([✂]) accounts for [✂] per cent of sales of standard anhydrous ammonia. Potential purchasers and distributors commented on the high customer risk associated with this business and in particular the risk that customers who are distributors of chemicals would prefer to switch to the JV rather than rely on another distributor, should such a company buy the Divestiture Package.

15.24 Some potential purchasers were of the view that the successful transfer of Kemira's business managers to the new owner of the Divestiture Package as planned would be a significant factor in ensuring customer retention. The main parties also shared this view. Another measure aimed at mitigating the customer risk was the proposed commitment for a period of two years not to solicit these personnel and customers. One potential purchaser ([✂]) argued that this measure should be in place for three years. We consider that the successful transfer of key personnel and non-solicitation measures are necessary to ensure the viability of the Divestiture Package in the hands of the new owner, but we are of the view that non-solicitation measures should not be in place for longer than two years, as this should be sufficient for the acquirer

[69]Liquid produced by the reaction of ammonia and nitric acid.
[70]Merger Remedies Study, DG Comp, European Commission, October 2005: http://ec.europa.eu/comm/competition/mergers/others/remedies_study.pdf.
[71][✂]
[72]The term 'customer' in this context comprises both companies which purchase the products from Kemira for onward sale (distributors) and end-users of these products.

to build its credibility in the marketplace and extending the term to three years would be detrimental to competition.

15.25 We considered the scale of the customer risk in more detail:

(a) Evidence from [✂] suggests that the risk of losing the largest customer of standard grade anhydrous ammonia ([✂]) after the proposed divestiture is high. [✂] Given the maturity of this market, it is very unlikely that the volume lost could be replaced by gaining new customers, [✂]. However, since the anhydrous ammonia business would continue to contribute to the standing charge (as described in paragraph 15.7*(a)*), we consider that the owner of the Divestiture Package would have an incentive to keep operating this segment.

(b) We also considered the impact of losing sales to distributors, who represent [✂] per cent[73] of the Divestiture Package's sales, as it was likely that the purchaser of the business would be a distributor. Although some potential purchasers expressed a general concern that all distributors were at risk of being lost to the JV, our view, based on the discussions we have had, is that this risk concerns one distributor in particular ([✂]). Our analysis shows that the loss of this distributor would affect the profitability of the Divestiture Package only to a very limited extent. We concluded that other distributors ([✂]) were less likely to switch away from the purchaser of the Divestiture Package given their specific circumstances.

(c) We also contacted three other major customers ([✂]). Whilst we could not be entirely confident that these companies would be willing to novate their contract to the purchaser of the divested business, their evidence suggested that in principle these companies would be prepared to transfer their custom to the new owner.

- *Transfer price*

15.26 The viability of the divested business is likely to hinge on the methodology used to calculate the transfer price for the products to be paid to the JV by the purchaser.

15.27 The parties put forward a formula for the transfer price for the relevant process chemicals which would take into account fixed and variable costs separately as follows:

(a) The total fixed costs for the relevant process chemicals would be converted into a monthly standing charge. The direct fixed costs would include the operating costs, maintenance costs, other direct plant fixed costs and depreciation of the relevant facilities. The indirect fixed costs concern only aqueous ammonia and nitric acid and would consist of a proportion of the fixed costs attributable to the plants which produce the inputs into the production of the relevant process chemical.

(b) The variable cost element would represent the price per tonne of product and would comprise the sum of the gas cost element, which is the gas cost multiplied by a factor reflecting the quantity of gas in the relevant process chemical and other variable costs such as utilities.

[73]Excludes [✂], as the company views itself as a manufacturer, and the impact of losing this company is considered in paragraph 15.25*(a)*.

15.28 Some potential purchasers argued that the transfer price should only include variable costs and others argued that the standing charge should be adjusted down if significant volumes of business were lost. The main parties, on the other hand, argued that a standing charge fixed regardless of volume would provide more incentives to the new owner of the business to compete. We consider that the standing charge is necessary in order to provide an incentive for the purchaser to compete across all products which were subject to the SLC decision and to expand sales, to provide an incentive to the JV to continue supporting the agreement at Ince and to provide a level playing field in the competition between the JV and the divested business.

15.29 To calculate the fixed charge, the parties proposed to use the direct and indirect costs for 2006 and to apply budget tonnages in order to calculate a normalized fixed cost per tonne of the relevant process chemical, using the approach taken in Kemira's management accounts. Kemira also offered to reduce the amount of the standing charge [✂] in order to reflect the CC's concerns in relation to customer risk.[74]

15.30 We reviewed the cost allocation methodology proposed by Kemira and decided that it was an appropriate basis for the calculation of the initial fixed and variable charges for the following reasons:

(a) Costs are derived from Kemira's management accounts, providing a readily accessible and easily understood data source for both the initial fixed and variable charges to be calculated and independently audited.

(b) We consider that the use of 2006 actual costs and 2007 budgeted volumes, adjusted downward by [✂], provide a sound basis for the determination of the opening standard charge. Kemira's 2006 actual costs are comparable to its 2007 budgeted costs but have the advantage over budgeted figures of having been independently reviewed in the due diligence process and audited. In addition, 2006 fixed costs are in line with 2003, the last full year of uninterrupted production at Ince.

15.31 We considered whether the loss of large customers, in particular [✂], should trigger an adjustment of the standing charge, as suggested by some potential purchasers. We noted that the potential purchaser would have a strong incentive to retain [✂] and other large customers, because of their large contribution to the fixed costs of the business. Allowing the standing charge to be adjusted down would weaken this incentive. We consider that the Divestiture Package as a whole would remain profitable even with the loss of a large customer, and that any concerns relating to customer risk should be reflected in the purchase price of the Divestiture Package. We therefore conclude that the potential loss of customers is not a sufficient reason for a reduction of the standing charge or for including a mechanism to adjust it.

15.32 The basis upon which the cost of the gas used in the production of the relevant process chemicals is calculated will be crucial to the competitiveness of the divested business. The main parties argued that because gas purchasing was of strategic importance to the JV, it was not appropriate for the actual gas price paid by the JV to be used in its dealings with the purchaser of the Divestiture Package. The parties proposed that the purchaser should be able to nominate its own gas pricing strategy or to instruct a third party consultant to nominate such a strategy on its behalf. The parties argued that this would in effect place the purchaser of the business in the

[74]This reduction was offered to the four prospective purchasers of the Divestiture Package during the due diligence stage and the offers were predicated on this revised cost base.

same position as a manufacturer of process chemicals. They suggested that if the purchaser was not able to nominate its own gas purchasing strategy, then a fallback price policy formula would apply. This formula would be based on the one-month-ahead UK wholesale gas price per therm published by Heren Energy, a publisher of gas, power and carbon market information.

15.33 Three of the four potential purchasers welcomed the opportunity to nominate their own gas purchasing strategy. One potential purchaser ([✂]) commented that there were many gas experts in the UK, who would be able to provide advice in this area.

15.34 We consider that the approach to gas pricing proposed by the main parties would significantly enhance competition between the JV and the purchaser of the Divestiture Package and therefore increase the effectiveness of the divestiture remedy.

15.35 One potential purchaser ([✂]) was concerned that the time difference in the price fluctuations between the Heren Index and the price paid by the JV would put the divested business at a disadvantage, particularly as the JV would be able to import ammonia more easily into Billingham than into Ince. We noted that this issue would only arise if the purchaser of the Divestiture Package adopted the fallback price policy formula. We considered that to a large extent timing differences would balance themselves out over the course of the year and had seen no evidence that Terra was consistently able to obtain gas more cheaply than Kemira.

15.36 The parties recognized that the divested business could be at a disadvantage if it became more economic to import ammonia than to produce it in the UK. The parties proposed that the purchaser should be given the option to substitute the variable cost of producing ammonia under the pricing formula for an imported ammonia price. This option would be triggered if the following conditions were met: *(a)* the JV was importing ammonia at Billingham; and *(b)* the variable cost of producing ammonia at Ince using the prevailing Heren one-month-ahead gas price exceeded the imported ammonia price. We consider that the parties' proposal would in principle deal with the risk that particularly high gas prices could present for the purchaser of the divested business, but take the view that the preferred bidder should be free to negotiate a different arrangement if required.

15.37 Process chemical customers and potential purchasers of the Divestiture Package alike expressed the need for any efficiency savings achieved by the JV at Ince to be passed on to the purchaser of the business to ensure that it remained competitive with the JV. We noted that the production of the relevant process chemicals involved mature technologies. We therefore did not expect significant continuous efficiency improvements. Rather, we anticipated that efficiency improvements would be more likely to occur as a result of the maintenance expenditure currently carried out by Kemira [✂].

15.38 A number of potential purchasers and customers expressed concerns over the indexation of costs. We consider that the choice of index used for adjusting the standing charge and the variable costs should be a matter for negotiation between the purchaser and the JV. However, if an index or basket of indices is needed it should be relevant, reliable and published.

15.39 We consider that a review of the following aspects of the transfer price should be undertaken by an independent third party, [✂]:

(a) the level of the standing charge and its indexation; and

(b) the level of the variable costs and their indexation.

15.40 The appointment of the independent third party would be mutually agreed by the JV and the purchaser of the Divestiture Package. Any recommendation made by this third party will be binding on the JV and the purchaser of the Divestiture Package. The cost of this review will be borne by the JV.

- *Potential closure of the Ince site*

15.41 All the potential purchasers we talked to were concerned that the Ince site might close in the near future. The bidding documentation (with one exception) reflected such concerns.

15.42 We consider that the closure of the Ince site, if it were to occur, would not be an adverse effect which may be expected to result from the SLCs in the markets for anhydrous ammonia, aqueous ammonia, and nitric acid of 58 to 60 per cent concentration. The decision to close the facility, if such a decision were made, would be driven by the economic consequences of competition in the fertilizer market. We therefore considered that we would not be able to take any action to prevent the closure of the Ince site when designing a remedy for the SLCs in each of the markets for the relevant process chemicals.

15.43 However, in order to provide a remedy which is effective in addressing the SLCs, it is important that the divestiture package should be saleable to a suitable purchaser. Because a perceived risk of closure on the part of potential purchasers may seriously damage the saleability of the business, we consider that the parties should put in place measures designed to attract a suitable purchaser. We decided that there were two acceptable ways of dealing with this:

(a) a commitment not to close the Ince site permanently to be given by the parties to the JV for a period acceptable to the purchaser of the Divestiture Package; and/or

(b) if the Ince site were to close down permanently, a commitment from the JV to supply the relevant process chemicals from Billingham to the purchaser of the Divestiture Package under suitable terms and conditions and for a period of time to be agreed with the purchaser.

15.44 Although it is our view that such matters should be the subject of negotiations between the preferred bidder and the JV, we would seek to satisfy ourselves that any agreements between these parties do not conflict with the CC's objective to preserve competition in the markets for anhydrous ammonia, aqueous ammonia and nitric acid of 58 to 60 per cent concentration.

Alternative divestiture package

15.45 We considered whether the sale of Terra's Billingham process chemicals business would be a more effective remedy than the sale of Kemira's process chemicals business. Although some third parties commented that the scale of this business—including customers receiving their deliveries by pipeline under long-term supply arrangements—would make it a more viable package, many did not consider that there was any particular advantage in selling the Billingham plant rather than the Ince plant and some commented that the focus of the Billingham facility on sales to a number of very large pipeline customers was a disadvantage.

15.46 Terra told us that separating the out-loading facilities at Billingham would present practical difficulties, which could be solved contractually, but would add to the complexity of a sale: [✂].

15.47 We consider that, in the longer term, the Billingham site may be able to withstand competition better than the Ince site due to its scale and the significant revenue stream it derives from pipeline customers. [✂][75]

15.48 The analyses of the cost bases of [✂] facilities provided by Kemira and Terra showed that [✂] the Ince Divestiture Package will be viable in this regard.

15.49 At present, based on the evidence presented, we consider that the sale of the process chemicals business at Billingham would not be more effective than the sale of the process chemicals business at Ince.

Suitable purchasers of the divestiture package

15.50 Once we had identified a suitable divestiture package, we considered whether a suitable purchaser might be available. The CC's guidance states that the particular criteria used for assessing the suitability of a purchaser will depend on the facts of the case, but in general a suitable purchaser will be one who is:[76]

(a) independent of the merger parties;

(b) capable of using the divestiture packages to compete effectively in the market; and

(c) free from competition concerns.

15.51 We spoke to all the potential purchasers identified by the main parties: [✂].

15.52 We satisfied ourselves that these potential purchasers were independent from the main parties and that they each had the capability to operate the Divestiture Package as a going concern.

15.53 Two of the potential purchasers were active in the distribution of the relevant process chemicals in the UK: [✂].

15.54 The acquisition of the divested business would be likely to constitute a qualifying merger under the Act[77] for either of these two companies as both the divested business and the potential purchasers are active in 'distribution' and the share of supply test (25 per cent) would be met. The sale of Kemira's Ince process chemicals business to either [✂] or [✂] would therefore appear to result in a relevant merger situation under the Act and could therefore become subject to an investigation by the OFT. Without wishing to prejudge the outcome of any OFT investigation, we considered that, given [✂] high share of final sales of nitric acid of 60 per cent concentration, a purchase of the Divestiture Package by this company was more likely to result in competition concerns.

15.55 Given the criteria set out in paragraph 15.50, the pool of suitable potential purchasers is likely to be restricted to established companies in the UK chemical distribution industry. We noted that, given the structure of the deal, suitable purchasers may not

[75] [✂]
[76] *CC8*, paragraph 4.1.
[77] Under section 23 of the Act.

be forthcoming. Notwithstanding our concerns about the suitability of certain purchasers, it appears probable that a suitable purchaser would be found for the Divestiture Package.

Effective divestiture process

15.56 As stated in its guidance,[78] where the CC is in doubt as to the viability or attractiveness to purchasers of a proposed divestiture package or if it believes that there may be only a limited pool of suitable purchasers, it may require the merger parties to identify a suitable purchaser that is contractually committed to the transaction before permitting a proposed merger to proceed. Where the CC considers that the competitive capability of the divestiture package may deteriorate pending the divestiture or completion of the divestiture may be prolonged, it may also require that the up-front buyer completes the acquisition before the merger may proceed.

15.57 Experience[79] shows that in the case of a carve-out of assets, separating the business can be a complex task, not all elements of which the main parties and the purchaser can fully anticipate. This gives rise to many risks, such as: the need to replicate certain assets by the purchaser requiring a significant commitment of resources and investment that sellers often under-estimate; potential disputes relating to the allocation of personnel; failure to obtain the full transfer of assets; issues relating to the transfer of customers; and risk of losing key personnel. Some of these risks may persist beyond the period of negotiation between the parties.

15.58 In this case, the potential purchasers have raised a number of points which would need to be resolved and could prolong the negotiations between Kemira and its preferred bidder. In these circumstances, to address the implementation risks we have decided that the binding Business Transfer Agreement, the Lease and the Operating, Maintenance and Supply Agreement would have to be signed before the JV may proceed.

Conclusion on divestiture remedy

15.59 We concluded that the divestment of Ince's process chemicals business, supported by an agreement for the JV to supply anhydrous ammonia, aqueous ammonia and nitric acid of 60 per cent concentration, would be an effective remedy, provided it is implemented in accordance with our recommendations.

Price control remedies in relation to the relevant process chemicals

15.60 We considered whether price control mechanisms would be effective in addressing the expected SLC in the markets for anhydrous ammonia, aqueous ammonia and nitric acid of 58 to 60 per cent concentration.

15.61 We noted that while behavioural remedies may address the adverse effects, they do not necessarily restore competition. For example, a remedy controlling prices would inevitably lead to prices being determined by regulation rather than competitive forces. We also had some general concerns about such remedies, in particular:

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[78] *CC8*, paragraph 4.5.
[79] See footnote to paragraph 15.20.

(a) their effectiveness in achieving appropriate price levels, particularly as prices are typically negotiated and differ between customers;

(b) the complexity of each such remedy, the market distortions it might create and the possible difficulty of monitoring compliance and enforcement generally; and

(c) the length of time each remedy might need to remain in place to continue addressing the relevant SLC.

15.62 The parties put forward a price control mechanism, which would be based on the following factors:

(a) the price of gas, as published by an independent third party such as Heren Energy, multiplied by an agreed factor (representing its ammonia content) to convert it into a price per tonne for each process chemical, representing its ammonia content;

(b) a tolling fee, including fixed costs and an operating margin, which would be calculated by reference to the lower end of the prices which Kemira and Terra charged to their current customers, and would be adjusted on an annual basis according to an appropriate third party index;

(c) transport costs, which would be flexible and transparent; and

(d) volume discounts.

15.63 The price control mechanism would be complemented with supply commitments, a system of penalties for delayed deliveries, a fast-track dispute resolution procedure and a monitoring trustee.

15.64 The main parties argued that such a remedy would be workable, as it would be based on verifiable benchmarks and would not require any significant ongoing monitoring. They also argued that the remedy would not have an adverse effect on competition, since the pricing formula was directly linked to changes in input costs, the market was fairly static, there was no prospect for significant innovation or new product development, and there were no related products or competitors that could be affected by this remedy.

15.65 Some of the customers we talked to supported a price control remedy in principle, but there was general recognition that devising a price that would work for all customers would be difficult and some unease about the fact that the JV would be able to pass on all cost increases to its customers.

15.66 We noted that the price control mechanism proposed by the parties would to some extent remedy the adverse effects resulting from the SLC. However, we still had some concerns:

(a) The proposal could not replicate the dynamics of a competitive market such as the individual companies' ability to negotiate and the impact of growth or decline in the downstream market.

(b) To be effective the tolling fee would need to be applicable across all the parties' UK plants. It was unclear whether this would be practical.

(c) This remedy would need to be in place for the foreseeable future and was likely to become increasingly less effective, particularly as it was envisaged that the tolling fee would be adjusted according to an index rather than changes in the

actual costs of operating the plants; in that respect, we noted that the main parties were planning a significant restructuring of their manufacturing base, which might result in a significantly different cost base.

15.67 The main parties argued that mechanisms could be devised to address all these concerns. We agreed that with further work the identified defects might be, to an extent, addressed but doing so would increase the complexity of the remedies. In addition, their effectiveness was bound to be eroded over time. We therefore concluded that price controls for the relevant process chemicals would not be an effective remedy.

Remedies relating to CO_2

Remedy focused on the contract between Kemira and Air Liquide

15.68 We considered whether a remedy that would focus on the contract between Kemira and Air Liquide could be effective. By ensuring that CO_2 from the Ince site reaches the market in a broadly similar way and on broadly similar terms as before the JV, such a remedy could ensure that the incentives facing the JV would be broadly the same as Terra's incentives before the merger. In particular, the JV would face no greater incentives to restrict supply or raise prices than Terra did before the merger. It would be necessary to ensure that the JV could not terminate the contract or exercise any discretion under the contract in such a way as to take advantage of the new situation. As indicated in our Notice of possible remedies, this would require the following changes to the contractual arrangements between Kemira (and subsequently the JV) and Air Liquide:

(a) increasing the duration of the existing contract on comparable terms and conditions; and

(b) ensuring that where there was scope in the contract for Air Liquide to vary its off-take by agreement with Kemira, the JV would be unable to withhold agreement.

Views of Air Liquide

15.69 Air Liquide told us that the contractual commitments suggested in the Notice of possible remedies went some way to alleviating the adverse effects of the anticipated JV, but that they were not sufficient. Air Liquide raised with us the following issues:

(a) The JV would result in the loss of competition between Kemira and Terra for that volume of CO_2 which could be easily switched between Ince and Billingham or Severnside. [✂]

(b) The contract is dependent on a lease of land at Ince. [✂]

(c) The JV could shut down or mothball the Ince ammonia plant subject to maximum compensation payments of £[✂] to Air Liquide. The JV could recoup more than the compensation payment by being able to (i) raise prices for liquid CO_2 supplied from its own facilities and (ii) reduce costs by extensive periods of inactivity at Ince.

(d) Due to the seasonality of demand and [✂], Air Liquide needs access on demand to an amount of raw CO_2 on a daily basis sufficient to produce up to [✂] tonnes of CO_2 per day, to prevent the JV from raising prices.

(e) The JV could shift costs between its sites and could be less aggressive at keeping operating labour costs down at Ince relative to Billingham and/or Severnside. Air Liquide was particularly concerned about the basis of allocation of overhead costs which, it estimated, amounted to about £[✂] a year.

(f) Differences between the JV's and Kemira's commercial incentives regarding the supply of CO_2 to Air Liquide meant that the JV would approach various aspects of the contract differently.

(g) A contract extension could not commercially be on the same terms as currently with regard to [✂] CO_2. The cost had been set at a level that allowed Kemira to recover the costs of its investment in the raw CO_2 facility at Ince and those investments were now fully, or almost fully, depreciated. Any new terms as agreed between Air Liquide and Kemira would need to be in place before the JV could proceed (rather than from [✂], the year of the expected contract renewal). This was, inter alia, to preserve the supply of competitively-priced CO_2 from Terra in respect of which contracts for the supply of CO_2 were capable of expiry (at Terra's initiative) before [✂]. If new pricing terms agreed between Air Liquide and Kemira only took effect in [✂], then the JV would have the ability to raise prices above the competitive level before then. Air Liquide did not believe that an information barrier between the JV's operations at Ince and Billingham/ Severnside would work to alleviate those concerns.

15.70 Air Liquide concluded that, due to the large number of issues, a number of which had not been addressed in the Notice on possible remedies, the remedy should entail changes to the contract within parameters determined by the CC before the JV could be approved. Any remedy based on changes to the contract that required an 'agreement to agree' based on the CC's proposals as explained to Air Liquide could not work.

15.71 Air Liquide was also concerned that, because the contract gave Kemira detailed information about Air Liquide's costs, if the JV proceeded, not only would the JV be the dominant supplier of liquid CO_2 to distributors in the UK, but it would have detailed information regarding the cost base of one of its major customers. Air Liquide believed that this information could be used to the detriment of Air Liquide and CO_2 customers more widely.

15.72 Air Liquide argued that the JV should not be able to serve notice to terminate the contract for a period of at least five years from the date when the CC's remedy became effective and that any amendments to the contract should remain in place unless and until the OFT had found that a material change in market conditions had occurred.

15.73 Air Liquide also argued that the effectiveness of the remedy necessarily required the continued operation of the plant at Ince or appropriate protection for Air Liquide in the event that the Ince site were to close. It stated that the Ince plant was more likely to close than any of the JV's other UK plants and that potential benefits in relation to CO_2 would be a factor in the JV making such a decision.

Views of other third parties

15.74 Another company, [✂], was concerned that a remedy addressing the terms of the contract would adversely affect the availability of product to other distributors. It considered that extending the length of the contract between Kemira and Air Liquide would strengthen Air Liquide's position in the market for the supply of liquid CO_2 by

improving Air Liquide's strong position in relation to access to CO_2 and that this remedy would be anti-competitive.

15.75 These views were echoed by another company ([✂]). Although of the view that the remedy proposal relating to the Air Liquide contract was in principle acceptable, this company was concerned that the remedy would give a competitive advantage to Air Liquide, as it would benefit from current prices, whilst others might have to pay higher prices, as a consequence of any rationalization of the production base by the JV. The same company ([✂]) believed that any improvement in Air Liquide's production allocation ex works from the Ince plant would be to the detriment of its ([✂]) own product allocation ex works from the Ince plant, which [✂] has an agreement with Terra to purchase.[80] [✂] believed that to mitigate such risks, the duration of its contract of supply from Terra, which included product supplies from the Ince production facility, should be extended on comparable terms and conditions for a period of between five and ten years.

Views of the parties

15.76 Kemira[81] told us that:

(a) Although it was unclear whether there was competition between Ince and Billingham for the supply of CO_2 volumes, [✂].

(b) It was inconceivable that the JV would shut down or mothball the Ince ammonia plant in order to maximize profits from the sale of CO_2. The operation of the ammonia plant is critical to the production of fertilizers and the costs of shutting down and restarting the ammonia plant, combined with the lost profits on forgone fertilizer sales, would outstrip any profits that could conceivably be earned by the JV's CO_2 operation. For this reason, Kemira did not believe that it would need to provide higher compensation to Air Liquide in the event of non-supply. [✂]

(c) Kemira would also be prepared to introduce some form of compensation mechanism in the Agreement with Air Liquide to protect the interests of Air Liquide from any attempt by the JV to withhold supplies of raw gas to the Ince CO_2 liquefaction plant while the ammonia plant is operating and producing sufficient amounts of suitable raw gas.

(d) Measures preventing the communication of cost and pricing information relating to CO_2 produced at Ince to personnel involved in commercial negotiations in relation to liquid CO_2 produced at Billingham or Severnside ('Chinese walls') were not required, as Air Liquide was not a competitor to the JV and it was unclear that such information would give the JV a material advantage in negotiations with Air Liquide. Kemira was, however, prepared to set up information barriers to keep the outcome of any renegotiations of the Air Liquide contract as to price and costs confidential from the commercial CO_2 teams at Billingham/Severnside and to introduce a mechanism to maintain this confidentiality after the formation of the JV.

(e) To mitigate the JV's ability to shift costs from Billingham or Severnside to Ince, Kemira would be prepared to have its pre-JV fixed costs at Ince audited [✂].

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[80]This company has an agreement with Terra to obtain supplies from Air Liquide at Ince.
[81]Because of confidentiality issues, Terra was not involved in these discussions other than at a high level.

Assessment

15.77 We considered first Air Liquide's argument (paragraph 15.98*(c)*) that it was necessary to protect Air Liquide from the risk that Ince would close. In our view, this is not appropriate for the following reasons:

(a) The evidence we had received did not suggest that the JV would result in an increase in general in the risk of closure of Ince [✂].

(b) A decision by the JV to close Ince would be most unlikely to be driven by any aspect of the CO_2 market or the loss of competition in CO_2, which is a waste product of ammonia production. It would be much more likely to be driven by the need to rationalize the UK production base in the event of increased competition from imports of fertilizers.

(c) The possibility of the closure of Ince was already present when the contract between Air Liquide and Kemira was signed in 1997 and has been present ever since.

15.78 We also do not consider it necessary for the contract to provide an increased level of compensation to Air Liquide for supply disruption in order to remedy any adverse effects resulting from the SLC. In general, fertilizer producers have strong incentives to operate ammonia plants continuously and loss of competition in the CO_2 market is unlikely to have an effect on these incentives. We considered whether the creation of the JV itself would make it more likely that supply disruption at Ince would occur by, for example, giving opportunities to stop production at Ince whilst maintaining it at other sites. Based on the evidence that we have received [✂], we do not consider that supply disruption would be any more likely as a result of the JV [✂]. In addition, we note that such an argument is related to an effect of the formation of the JV but not to the SLC related to CO_2.

15.79 We accept, however, that Air Liquide would have sought to renegotiate the compensation term referred to in paragraph 15.69*(c)* absent the JV, especially as the level of compensation had not been indexed for inflation in the original contract.

15.80 In addition, we consider that:

(a) Absent the JV, Air Liquide and Kemira would, in all likelihood, have initiated a renegotiation of the price of raw CO_2. We do not believe that Kemira would have had any incentive to accept a lower price ahead of the [✂] renewal date or that Air Liquide's negotiating position would have allowed it to secure such an agreement.

(b) Chinese walls would be necessary, as the JV and Air Liquide both sell CO_2 to distributors and are therefore direct competitors; and to maintain Air Liquide's negotiating position in relation to its purchases of CO_2 from Terra.

(c) Kemira's proposal in relation to fixed costs addresses the issue identified by Air Liquide and should be part of this remedy.

15.81 Regarding the points made by the two companies in paragraphs 15.74 and 15.75, we consider that in the absence of the JV Air Liquide would have continued in a contractual arrangement with Kemira at Ince. We recognize that if the JV increased the price of the CO_2 it supplies to distributors, the risk in the downstream market identified by these two third parties will exist, but to the extent that the remedy preserves the pre-JV situation, we consider that such a risk will not worsen as a

result of the JV. We consider that such a risk is to a large extent inherent in the way that the downstream market is structured and the result of the strategies and investment decisions made by the different businesses over the years. We consider, however, that a requirement for Chinese walls would limit such a risk.

Divestiture remedy

15.82 We also considered whether a divestiture remedy relating to CO_2 would be possible and effective. There is no stand-alone facility dedicated to the production of raw CO_2. Raw CO_2 is a by-product of the production of ammonia, a building block of fertilizer production. A divestment of either party's assets involved in the production of raw CO_2 would also require the divestment of assets used in the production of ammonia which would extend far beyond the area of competitive overlap and would not be, in our view, proportionate to the SLC identified.

15.83 One company, [✂], considered that one practical remedy could be the divestiture of one of Terra's existing CO_2 liquefaction plants, coupled with the adjoining ammonia production facility or a guaranteed supply of raw CO_2 from an ammonia plant. This company was unsure about the way a supply agreement for raw CO_2 would need to be structured in order to be effective, but considered that, if this difficulty could be overcome, such a remedy would be effective. However, at this stage this company did not wish to become involved in ammonia production and neither the acquisition of an ammonia plant, nor a CO_2 liquefaction plant, would be attractive to it.

15.84 The divestiture of the CO_2 liquefaction plant at Ince would not be possible, since this plant is owned by Air Liquide.

15.85 We therefore considered in more detail whether a divestment remedy consisting of any of Terra's liquefaction plants supported by a contract for the supply of raw CO_2 from the adjacent ammonia production facility could be effective. [✂]

15.86 Since the purchaser would rely on the supply of raw CO_2 from Terra, for the remedy to be effective, Terra would be required to give supply and price commitments in relation to the supply of raw CO_2. In addition, for health and safety reasons, Terra would have to operate the plant on the purchaser's behalf. Therefore commitments relating to various aspects of the operation of the liquefaction plant would also need to be given. We noted that, since such arrangements already existed at Ince between Kemira and Air Liquide, designing an effective Divestiture Package and supply agreement should be possible.

15.87 The greatest risk of this remedy option relates to the availability of suitable potential purchasers. Such a business may only be attractive to distributors of industrial gases, as access to a distribution infrastructure would be necessary to make the acquisition of the liquefaction plant a viable business opportunity.[82] Air Liquide, Air Products and Yara each supply CO_2 and, given the size of Terra's CO_2 liquefaction facilities, acquisition by any of these purchasers may give rise to a relevant merger situation. Without wishing to prejudge the outcome of any OFT inquiry, there is a risk that an acquisition by any of these companies would give rise to competition concerns.

[82]As described in the Linde/BOC merger case BOC (Regulation (EC) No 139/2004–Case No Comp/M.4141–Linde/BOC), Air Liquide, Air Products and Yara are the main distributors of such gases.

15.88 BOC, on the other hand, does not currently supply CO_2 to distributors and its acquisition of the CO_2 plant would not appear to give rise to a relevant merger situation.[83]

15.89 One company ([✂]) argued that since the only likely purchaser would be a distributor of liquid CO_2, its incentives to supply other distributors would be different from those of Terra. While we acknowledged this view, the fact that the OFT would not have jurisdiction to review an acquisition of Terra's liquefaction facilities by BOC suggests that such a transaction would not give rise to potential competition concerns.

15.90 We therefore conclude that, whilst the pool of suitable potential purchasers would be likely to be very small, a divestment of Terra's CO_2 liquefaction facilities combined with suitable behavioural undertakings would nevertheless constitute an effective remedy to the SLC found in relation to the supply of CO_2 to distributors within the UK.

15.91 However, this remedy would be more restrictive and would impose a higher cost than suitably detailed commitments in relation to the contract between Kemira and Air Liquide at Ince because:

(a) In the absence of the JV, the continuation of the contract between Air Liquide and Kemira would have been likely, as CO_2 revenues contribute towards Kemira's fixed costs. A remedy consisting of the extension and tightening of this contract appears likely to have the least impact in the distribution market, as it continues an arrangement which has been negotiated in a competitive market.

(b) There would be difficulties in quantifying the costs of selling Terra's liquefaction facilities and setting up the supply contract between the potential purchaser and Terra. Obtaining undertakings from the JV in relation to the contract at Ince would be relatively simple and inexpensive.

(c) [✂]

(d) [✂]

(e) The very limited number of potential purchasers would be likely to result in a particularly low offer for Terra's liquefaction facilities.

Price control remedies

15.92 We considered price control remedies in relation to both raw and liquid CO_2.

15.93 One company ([✂]) suggested that a suitable remedy would be a price control placed on raw CO_2. This party suggested that the JV should be required to make raw CO_2 available to distributors at no cost, arguing that as the JV might become subject to the Government's Emissions Trading Scheme in 2012 and CO_2 is a waste product, such a pricing remedy would be reasonable. It is our view that such a remedy would be neither effective nor reasonable and practicable for the following reasons:

(a) We consider that there would be many practical obstacles associated with making raw CO_2 available as suggested. Raw CO_2 alone cannot be commercialized. It needs to be liquefied. For this remedy to be effective, the price cap would need to be complemented by detailed commitments relating to the liquefaction of CO_2, for example a commitment to allow third parties to build liquefaction plants

[83]Under section 23 of the Enterprise Act.

on any of the JV's sites. Not only would such a commitment be complex and difficult to enforce, it would also rely on third parties' willingness to invest in liquefaction facilities and would not become effective until a liquefaction plant had been built.

(b) We consider that there are other reasons why such a remedy is unsuitable. In principle, the CC believes that any price control should take as its starting point the competitive level of prices (although in practice a proxy would be required). We note that raw CO_2 is not generally traded and that a price of zero would be an extreme outcome from a competitive process. Theoretically, it may be possible to derive price estimates of raw CO_2 from Terra's liquid CO_2 prices. However, given the differences between the various contracts, and the different negotiating strengths of various market participants (which will vary over time), any pricing formula is likely to be complex and unreliable in its ability to approximate the outcome of a process of competition.

(c) There is little certainty that the JV's ammonia plants will be subject to the Government's Emissions Trading Scheme.

15.94 Another company ([✂]) favoured a price cap on the liquid CO_2 sold by the JV. However, it recognized that due to individually negotiated liquid CO_2 prices, it was not clear at what level any cap should be set. Liquid CO_2 is priced on an ex-works basis, in which the relative contributions of energy costs, raw materials and labour are not clearly reflected. Any price control put in place by the CC would need to be set at a level that would reflect the parties' underlying costs of production (with provision for a reasonable profit). This company was of the view that a commitment by the parties not to close any of their existing liquid CO_2 plants until alternative streams became available would also be needed.

15.95 [✂] told us that capping the price of liquid CO_2 would not be effective, as there was no clear benchmark to price it against. It also noted that a price control alone would not be sufficient and that supply commitments would also be required. We consider that, while it would be theoretically possible to set the ex-works price of liquid CO_2 at an arbitrary level, eg the lowest current price, such a price could not be said to be a satisfactory proxy for the competitive level of prices, since each customer negotiates individually a different price.

15.96 In addition, as liquid CO_2 cannot be stored economically for any significant period of time, it is difficult to see how a commitment to supply all customers as and when required could be designed and enforced.

15.97 A price cap could have significant distortive effects on the supply of CO_2 to distributors within the UK:

(a) Liquid CO_2 is supplied by Air Liquide, Air Products and North British Distillery as well as by Terra. If set too high, a price cap on the liquid CO_2 produced by the JV may lead to increased prices from other suppliers who would otherwise have to attempt to negotiate on prices. Alternatively, if set too low, a price cap on liquid CO_2 may disadvantage other suppliers. In addition, the publication of Terra's ex-works CO_2 price (which would be necessary to effect this remedy) may increase the likelihood of coordinated effects.

(b) A price cap may also be inappropriate in the face of possible changes in the market, for example as a result of plant closures, which may result in large changes in prices that would otherwise apply.

(c) In addition, a price cap could have the effect of deterring entry by bioethanol companies into the supply of CO_2 to distributors within the UK.

15.98 One company ([✂]) argued that the cap would need to be in place until suitable alternative sources of supply (such as bioethanol producers) came on stream, which it estimated to be likely in three to five years. This company suggested that this could be achieved by extending the life of the existing contracts ([✂]) between customers and Terra until, say, the end of 2010. This would also involve the removal of take-or-pay provisions (whilst retaining the JV's obligation to supply) so that customers could progressively reduce their purchases as alternative sources came on stream.

15.99 Another company ([✂]) considered that opportunities relating to CO_2 from bioethanol plants were currently speculative, but could become a reality within the longer term if certain issues were overcome.

15.100 We consider that although entry of bioethanol producers into this market is a possibility, the occurrence and timing of this event remain uncertain. A price control remedy in relation to CO_2 would therefore need to remain in place for the foreseeable future.

15.101 For the above reasons, we conclude that a price control remedy in relation to CO_2 would not be effective.

Prohibition

15.102 By preserving the market structure and competition prevailing pre-JV, prohibition would be an effective remedy. It would, however, be more restrictive than the equally effective package of remedies comprising the divestment of the Ince process chemicals business and behavioural undertakings relating to the contract between Kemira and Air Liquide.

15.103 We noted that the SLCs identified relate to a waste product (CO_2), representing revenues of about £[✂] million at the wholesale level and intermediate products (aqueous ammonia, anhydrous ammonia and nitric acid of 58 to 60 per cent concentration), representing less than £[✂] million in sales. By contrast, the combined sales of fertilizers by the main parties in the UK were £[✂] million in 2006.

15.104 Having regard to these circumstances, the Group concluded that prohibition of the JV would not be proportionate.

Conclusions

Conclusions on divestment

15.105 We will seek undertakings from the parties for the divestment of the following Divestiture Package to a suitable purchaser:

(a) a long-term lease of the relevant process chemicals out-loading facilities and storage tanks at the Ince plant, which would be operated by the JV on the purchaser's behalf;

(b) long-term supply agreements with the JV for nitric acid of 60 per cent concentration, anhydrous ammonia, and aqueous ammonia, under which the purchaser would have the ability to vary the volume of product it would buy from the JV;

(c) customer lists and other records from the Ince plant relating to customers in the UK for nitric acid of 60 per cent concentration, anhydrous ammonia and aqueous ammonia;

(d) other relevant records, written materials and intellectual property rights;

(e) access to appropriate know-how;

(f) reasonable endeavours to transfer all existing contracts with customers and distributors for the supply of nitric acid of 60 per cent concentration, anhydrous ammonia and aqueous ammonia from the Ince plant;

(g) The contracts of employment of the business managers who are responsible for sales, marketing and customer technical support;

(h) a commitment for a period of two years not to solicit the personnel and customers transferred to the purchaser; and

(i) to the extent legally transferable, all UK governmental licences, permits, authorizations and registrations relating to the divestiture package.

15.106 We will seek to mitigate risks associated with the continuing links between the two businesses by:

(a) reviewing and approving the supply agreement, following negotiations between the preferred bidder and the JV;

(b) requiring undertakings from the JV that the supply agreement and lease will not be modified without approval from the OFT[84] and requiring a provision reflecting this to be included in the supply agreement and the lease;

(c) requiring the JV to pay reasonable costs for any independent advice the OFT may need to call upon in order to carry out any review of the supply agreement, whether requested by the JV or the purchaser of the Divestiture Package;

(d) requiring the supply agreement to specify that, if there is a failure to provide timely supplies, the purchaser may rely on a liquidated damages clause.

15.107 We will require that the binding Business Transfer Agreement, Lease and Operating, Maintenance and Supply Agreement be signed before the JV may proceed.

Conclusions on CO_2

15.108 We will seek undertakings from the parties in relation to the following aspects of the contract between Kemira and Air Liquide:

(a) not to terminate the contract, except for due cause and subject to OFT approval;

(b) to give Air Liquide access to CO_2 up to the annual capacity of the plant;

(c) to allow Air Liquide to demand up to the maximum amount of liquid CO_2 that can be produced by the liquefaction plant on a daily basis, within the plant's annual capacity limit;

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[84]With the possible exception of a specified set of clauses and provided that the required changes are driven by external events, such as changes in legislation.

(d) to renew the lease under equivalent terms and conditions to those currently in force; and

(e) to put in place measures preventing the communication of commercial information relating to CO_2 produced at Ince, including, in particular, information relating to offtake, costs and pricing, to personnel involved in commercial negotiations in relation to CO_2 produced at Billingham and Severnside, and vice versa. Measures should also be put in place to ensure compliance with these obligations and periodic compliance statements provided to the OFT.

15.109 We will also require that the undertakings set out in the preceding paragraph be in place before the JV can proceed.

15.110 In addition, we conclude that Kemira should be required to offer to Air Liquide new terms in respect of the price of raw CO_2, and increased compensation for supply disruption reflecting inflationary cost increases, both of which were likely to have been renegotiated absent the JV, and should also offer Air Liquide a periodic audit and indexation of fixed costs at Ince.

15.111 We conclude that the JV should be allowed to proceed only when Kemira has made Air Liquide an offer of proposed changes to the contract which the CC considers reasonable and provided that Kemira gives an undertaking to the CC to keep that offer open for a period of three months. Air Liquide will be free to accept the offer in whole or in part, but any element of the offer not accepted after three months will lapse.

15.112 In assessing whether Kemira's offer to Air Liquide is reasonable, we will have regard to prevailing market conditions (including the wholesale price of CO_2 at the time of the negotiation) and we will take account of Air Liquide's views on the offer made.

Relevant customer benefits

15.113 Once the CC has identified its chosen remedy it may '… in particular, have regard to the effect of any [remedial] action on any relevant customer benefits in relation to the creation of the relevant merger situation concerned'.[85] Relevant customer benefits are defined in the Act as benefits that accrue to relevant customers in the form of lower prices, greater choice, higher quality or greater innovation.[86] In order to fall within the meaning of relevant customer benefit, a benefit must be expected to accrue within a reasonable time frame as a result of the merger and must be a benefit that was unlikely to accrue without the merger or events giving rise to a similar SLC.[87]

15.114 Neither the main parties nor any of the third parties that we consulted were able to identify any relevant customer benefits within the meaning of the Act. Although the JV is expected to result in efficiency savings, we have seen no evidence that these savings could be expected to result in prices lower than if the JV did not take place in the markets for anhydrous ammonia, aqueous ammonia, 58 to 60 per cent nitric acid and CO_2.

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[85]Sections 35(5) and 36(6) of the Act.
[86]Section 30 of the Act. See also *CC2*, paragraph 4.37.
[87]Section 30(2) of the Act.