

The viability of importing packaged chlorine from Europe

Summary

1. This appendix sets out our analysis of the viability of importing packaged chlorine from Europe.

2. On the basis of the evidence we saw and the analysis we conducted, we found that:
 - The parties' assertion that lower production costs in Continental Europe (hereafter 'Europe')—primarily electricity costs—offset the additional costs incurred in transporting packaged chlorine from Europe to the UK was open to question.
 - Importing packaged chlorine in drums from Europe is unlikely to be a sustainable source of competition.
 - While it might be marginally economic to import chlorine in some types of cylinder (but not in drums) from Europe, the returns were unlikely to attract significant entry. In volume terms, demand is predominantly for chlorine packaged in drums.

Assessing the viability of importing chlorine into the UK

3. A party selling packaged chlorine sourced from Europe in the UK will face a number of costs:
 - the cost of sourcing packaged chlorine in Europe (composed of the cost of bulk chlorine, the cost of packaging the chlorine and the producer margin);
 - the cost of transporting the packaged chlorine to the UK (probably to a depot);
 - the cost of distributing the packaged chlorine in the UK to customers; and
 - other UK costs such as sales costs, depot costs etc.

4. A potential importer is likely to compare these costs with the UK market price to determine whether it is economically attractive to compete in the UK market.
5. The main parties told us that the average selling prices for drums and cylinders in the UK were £[REDACTED] and £[REDACTED] per tonne respectively. This was broadly in line with Table 8 of Appendix D, which showed that the average UK price for cylinders was £[REDACTED] per tonne and the average UK price for drums was £[REDACTED] per tonne.
6. The main parties stated that ‘production cost advantages associated with the manufacture of packaged chlorine in Western Europe offset additional transport costs and make this activity economically viable’ and, further, that the ‘transportation of packaged chlorine itself presents no particular difficulty’. In order to test this, we examined the costs of producing chlorine in alternative locations outside the UK, and the costs of transporting this chlorine as packaged chlorine to the UK. This section focuses on two key areas:
 - an examination of chlorine production costs in Europe compared with the UK; and
 - an assessment of the costs of transporting packaged chlorine from Europe to the UK and then to the customer.
7. The focus of this analysis is on the production of chlorine and transportation of packaged chlorine (ie cylinders and drums). We did not examine bulk chlorine imports from Europe as evidence suggested that this would face considerable regulatory barriers.¹
8. The chlorine distribution chain in the UK consists of four primary suppliers to end-customers: Ineos Chlor, BOC, Albion and Air Products. The main parties suggested that Air Products sourced its chlorine cylinders (at least in part) from its packaging

plant in Spain. According to the main parties, additional imported chlorine was provided by Gerling Holz (Germany) and MSSA, among others.

Chlorine production costs

9. We first address the production cost of bulk chlorine. The main parties suggested that 'cost differentials facilitate imports of packaged chlorine from Western Europe into the UK'. BOC and Ineos Chlor stated that the major input cost in the manufacture of chlorine was energy, which was cheaper in Europe than in the UK. As a consequence, [redacted] and [redacted] distributors sold drums locally for £[redacted] to £[redacted] per tonne, compared with £[redacted] per tonne for drums in the UK. The main parties argued that importing could be competitive despite higher transport costs. They further stated that packaged chlorine distributors based in mainland Europe were 'capable of supplying UK customers on an economic basis' and 'well-positioned as potential entrants to the UK market'. In testing this assertion, our analysis focused on production and transportation costs from mainland Europe.

10. We looked at the price of electricity in different European countries for large industrial customers using data from BERR. Electricity is a significant cost element in chlor-alkali production, estimated to account for 60 per cent of the variable costs of production and approximately 40 per cent of total production cost.² This data supported the case that electricity costs were generally higher in the UK compared with the EU15 median and, particularly, in comparison with France and Spain. However, we noted that, with the exception of 2006, electricity costs in Germany (which accounted for almost 44 per cent of total chlorine production in Europe in

¹See Appendix G for further details of the regulatory environment.

²Source: 'Impact of Electricity Price on the Competitiveness of the European Chlor-Alkali Industry' Prochemics study for Euro Chlor, October 2007. Estimated electricity price is €210/mt out of a total cost of €541.8/mt for an Electrochemical Unit (ECU). An ECU reflects the combined output of chlorine and sodium hydroxide from the manufacturing process (1 part chlorine to 1.1 parts sodium hydroxide). The parties told us that the Prochemics analysis was not based on reliable and robust data. However, we noted that the report was available on the Eurochlor website and was extensively referred to in a presentation on energy costs also on the Eurochlor website; <http://ec.europa.eu/enterprise/chemicals/hlg/docs/ineos.ppt>, and we therefore considered that it was appropriate for us to rely on it for these purposes.

2006³) had been markedly higher than the UK (as much as 44 per cent in 2003).⁴

Further, UK price variance with France, Spain and the EU15 median had fallen in the last two years. Data from an October 2007 Prochemics study for Eurochlor, based on 2006 data for general industrial power prices in €/MWh, broadly supported this cost differential, although industrial power prices in Spain were higher than in the UK according to this data.

11. We used our analysis of electricity prices to derive estimates of the cost of bulk chlorine production in different European countries.
12. From our analysis, it appeared that chlorine production costs for comparable plant would have been lower in France and Spain than in the UK over the last three years. However, we noted that these cost differentials, based solely on electricity price adjustments for each country, had reduced in magnitude over the three-year period, such that production costs in Spain, for example, would have only been about 4.4 per cent lower than in the UK in 2008. We received information from Air Products that suggested the cost of bulk chlorine in Spain was €[redacted] to €[redacted] per tonne (£[redacted] to £[redacted] per tonne), which we noted correlated reasonably well with our analysis.⁵
13. In addition, we examined comparisons between the UK and Germany which illustrated that, on the basis of electricity cost adjustments alone, the cost of production differentials had moved in favour of the UK over the last three years, such that it would have been 7.3 per cent more expensive to produce chlorine in Germany than in the UK in 2008.

³Source: Eurochlor.

⁴The parties disagreed with this analysis, however, and considered that electricity prices were lower in Germany than in the UK. We nevertheless considered that it was appropriate to rely on BERR data.

⁵We use an exchange rate of €0.795/£ in this appendix for our analysis.

14. We found that, on the basis of our analysis and the linear relationship between electricity prices and chlorine production cost, the main parties' submission that chlorine production was cheaper in Europe than in the UK as a result of lower energy costs was not always correct. We accepted that our analysis was an approximation only. For example, chlor-alkali production costs other than electricity might well vary by country, because of variations in regulatory, labour and operational costs, for example. In response to our analysis the main parties provided market price comparisons for bulk chlorine in the UK, France and Germany from Harriman Chemsult's Chlor Alkali Price Summary. These figures showed that the market price in the UK was higher than in Germany and France.⁶
15. In paragraph 6 we noted that the main parties stated that 'production cost advantages associated with the manufacture of packaged chlorine in Western Europe offset additional transport costs and make this activity economically viable'. If market prices were entirely reflective of production costs, and the only variance in production costs were due to differences in electricity costs, then our analysis would suggest that transport costs from France and Spain would need to be below a range of [redacted] per tonne from France or [redacted] per tonne from Spain⁷ to provide an economically viable, competitive alternative to UK-sourced packaged chlorine. On this basis, and assuming selling prices of [redacted] per tonne for drums and [redacted] per tonne for cylinders (see paragraph 5), transport costs would need to represent a very small proportion of the overall selling price for packaged chlorine in the UK (around [redacted] per cent for drums and [redacted] per cent for cylinders). Given that our analysis suggested that chlorine production costs in Germany could well have been higher than in the UK over the last two years, we considered that, based on energy costs alone, importing

⁶This report shows upper and lower prices in the three countries. We understand from the parties that the report is published monthly but note that the prices for each country are static for long periods (eg the Germany prices have not moved since January 2007 and the UK and France figures have not moved since January 2008). In addition, we noted that the prices quoted for the UK appear generally to be [redacted] than the prices Ineos Chlor told us it charged to its major chlorine customers. Ineos also told us that prices were [redacted], which further reduced the reliance we could place on this information.

packaged chlorine from Germany would currently not be economically viable. In practice, however, we considered it more relevant to look at the price of packaged chlorine delivered to the UK rather than either the cost of producing bulk chlorine or the market price of bulk chlorine, since that more closely reflected the economic decisions faced by a potential importer.

Costs of packaged chlorine

16. We did not have cost data for the packaging of chlorine in different European countries. However, Air Products provided a breakdown of estimated costs which is shown in Table 1. For drums, the raw materials costs represent a large proportion ([X]) of the local packaged chlorine cost but, for cylinders, the cost of filling is more significant (raw materials represent around [X] per cent of overall local packaged chlorine costs for 71kg cylinders and around [X] per cent for 39kg cylinders). In the case of cylinders therefore we considered that it was less likely that the difference in energy cost between the UK and Europe is significant and this data indicated to us that an efficient filling operation might be key to ensuring a cost competitive product. In addition, BOC provided details of chlorine sourced from a number of European packagers which are also detailed in Table 1. [X]

TABLE 1 Estimates of packaged chlorine prices

	€/tonne		
	Small cylinders (39kg)	Large cylinders (71kg)	Drums (980 kg)
<i>Air Products figures</i>			
Raw materials	[X]	[X]	[X]
Filling cost	[X]	[X]	[X]
Total	[X]	[X]	[X]
<i>Figures from BOC for the price of packaged chlorine from various European packagers</i>			
[X]	[X]	[X]	[X]
[X]	[X]	[X]	[X]
[X]	[X]	[X]	[X]
[X]	[X]	[X]	[X]

Source: Air Products and BOC.

⁷These values are based on the cost differentials in the production of chlorine arising solely from the variable electricity costs shown in Table 3 for 2006/08.

17. For comparison, BOC also provided estimates of the cost of chlorine packed for it by Albion in the UK. These costs were £[redacted] per tonne (€[redacted] per tonne) for 980kg drums and a range of £[redacted] to £[redacted] per tonne (€[redacted] to €[redacted] per tonne) for cylinders. However, we note that this cost includes an internal BOC cost for checking the packages and rectifying problems of £[redacted] per drum or cylinder,⁸ and that BOC said the problems were not experienced with drums and cylinders received from continental packers.⁹ The checking process and the rectification of problems significantly increases the costs of cylinders. Using the cost quoted of £[redacted] per drum and cylinder (irrespective of size of cylinder (see footnote 8 below), adds £[redacted] per tonne (€[redacted] per tonne) to the cost of 71kg cylinders and £[redacted] per tonne (€[redacted] per tonne) to the cost of 39kg cylinders. Since the problem as described by BOC—which seems to be a significant quality issue—would seem at present to be associated with Albion, we would expect (particularly in view of the magnitude of these costs) that BOC would work closely with Albion to reduce them as a matter of urgency since it would reduce considerably BOC's costs. We are not aware of a similar issue for Ineos Chlor filled packages.

Costs of transportation

18. Having examined production costs and data on packaged chlorine prices in Europe, we then looked at the main parties' view that cheaper production costs in Europe potentially offset the additional expense incurred in transporting packaged chlorine to the UK.

⁸We noted that the rectification cost suggested by BOC was £[redacted] per faulty cylinder and that the number of faults was much higher for 71kg cylinders ([redacted] per cent) than for 39kg cylinders ([redacted] per cent). These fault rates implied that the checking and rectification cost amounted to £[redacted] per 71kg cylinder and £[redacted] per 39 kg cylinder and the £[redacted] per cylinder quoted by BOC represented an approximate average.

⁹BOC said that these costs were specifically related to problems with the cylinders when they were returned to BOC from Albion, with the 71kg cylinders in particular having a number of significant defects and requiring treatment to remedy them. If BOC was using Continental suppliers only, it said that it might still carry out the checks (as it considered this to be best practice), but it noted that the cost of checking was only £[redacted] per cylinder and the major cost of £[redacted] per cylinder or drum was only incurred when a fault was discovered. [redacted]

Views of third parties

19. The final section of this appendix provides more detailed comments made by parties on transport costs and their impact on the ability of the parties to compete effectively in the UK. Table 2 provides an overview of the evidence we received on transport costs and selling prices for drums. The table is mainly concerned with transport costs from Europe to the UK but it also contains data on UK distribution costs, particularly the information provided by Exel on the costs of delivering packaged chlorine under the contract it has with Ineos Chlor for the UK distribution of chlorine packages. The table also includes estimates provided by Air Products of its UK distribution costs. Table 3 shows the evidence received on cylinders.
20. Gerling Holz described its entry strategy for the UK market in 2006/07. According to Gerling Holz, the strategy was to provide water companies with security of supply (in the context of there being only one chlorine manufacturer in the UK) in the full knowledge that it was highly unlikely that Gerling Holz would be able to compete on price. This indicated that, although limited quantities of imported chlorine would be of interest to UK water companies, this would be on strategic rather than on economic grounds.¹⁰ Gerling Holz told us that ‘from a cost point of view, nobody [from] outside of the UK can be competitive’ in the supply of packaged chlorine given the high costs of transportation and the fact that these were additional to the costs faced by UK-based distributors. Gerling Holz considered that chlorine was a low-cost (ie low-priced) product unable to bear significant freight costs. As a consequence, Gerling Holz was not currently pursuing plans to expand its chlorine distribution business to the UK.

¹⁰Gerling Holz hearing with CC, 16 July 2008. See also commentary on regulation in Appendix G on Entry which highlights that, while security of supply and dual sourcing have been issues for water companies, there appear to be no regulatory requirements for water companies to have dual sourcing arrangements in place.

21. Air Products also noted in its evidence that, whilst it was considering plans to import packaged chlorine into the UK from Spain, this would not be a sizeable entry because ‘pricing is too low versus import costs and shipping constraints’.¹¹ Air Products told us that transport costs and regulatory costs made it prohibitive to import packaged chlorine into the UK. Air Products also said that it was not economic to ship cylinders over long distances given the costs associated with the weight of metals.
22. The UK prices reported by third parties in Tables 2 and 3 are significantly higher than those quoted by the main parties (paragraph 5) and it is therefore unlikely that there will be significant opportunity to gain new customers at these price levels.

TABLE 2 Third party evidence on transport costs and UK selling prices (980kg drums)

Party	Comment	Implied transport cost per tonne	Estimated selling price per tonne
Gerling Holz Air Products	<ul style="list-style-type: none"> • Fully loaded trailer from San Celoni (Barcelona) to a central point in North-West UK: [REDACTED] • Additional distribution costs in UK 	[REDACTED] [REDACTED] for UK distribution*	[REDACTED] [REDACTED]
Air Liquide	<ul style="list-style-type: none"> • Transport costs for imported packaged chlorine: [REDACTED] round trip for an [REDACTED] drum load or ‘about [REDACTED] per drum’ • From [REDACTED] • UK distribution costs estimated at [REDACTED] for a return trip 	[REDACTED] + UK distribution	N/A
Exel	<ul style="list-style-type: none"> • Average cost of transporting drums within the UK 	[REDACTED]	N/A

Source: Main parties’ and third parties’ written evidence.

*Air Products told us that its costs were round trip costs for delivery to a central UK location and that local distribution to the UK customer was shown separately.

†Exel told us that transport costs included tractor unit and trailer cost and depreciation, asset maintenance, drivers’ wages, fuel, tyres, insurance, overhead and business profit.

23. Based on comparable prices for drums cited by the parties (£[REDACTED] per tonne) and customers (around £[REDACTED] to £[REDACTED] per tonne), importing drums does not allow Gerling Holz to compete on price, even at the upper end of selling price estimates (£[REDACTED]),

¹¹Air Products suggested that it would consider importing packaged chlorine from Spain but told us that it did not currently import any packaged chlorine from Spain; all material for the UK market currently came from Albion, which in turn was supplied by Ineos Chlor.

Gerling Holz's prices to end-customers would be [X] per cent higher. Further, the additional transportation costs within the UK (as illustrated in Table 2 by Exel's average price), and the possibility that chlorine production costs in Germany could be higher than in the UK, means that importing drums becomes even less compelling, even in the event of a 5 to 10 per cent price rise.

24. Evidence from Air Products suggested a UK selling price for large drums (980kg) imported from Spain of £[X]. Again, this is substantially higher ([X] per cent) than the parties' estimated selling price of £[X] per tonne.

25. Air Liquide estimated that import costs for drums were in the region of £[X] per tonne. This would equate to approximately [X] per cent of an overall selling price of £[X] per tonne.¹² From our earlier analysis of production costs, Air Liquide's figures also call into question the economic viability of importing drums, particularly given that the current Air Liquide source is in Germany, where chlorine production costs could well be higher than in the UK as a result of higher electricity prices.

¹²A price rise of 10 per cent would bring transport costs down to approximately [X] per cent of the selling price.

TABLE 3 Third party evidence on transport costs and UK selling prices (cylinders)

Party	Comment	Implied transport cost per tonne	Estimated selling price per tonne
Gerling Holz Air Products	<ul style="list-style-type: none"> Fully loaded trailer from San Celoni (Barcelona) to a central point in NW UK [£] Average UK selling price: £[£] for small cylinders, £[£] for large cylinders (ex-works) Additional distribution costs in UK: £[£]/cylinder (large), £[£]/cylinder (small) 	[£] 71kg: [£] 33kg: [£] 39kg: [£] + UK distribution*	[£] 71kg: [£] 39kg: [£] 33kg: [£]
Air Liquide	<ul style="list-style-type: none"> Current contracted cost for importing from Krefeld-Gellep, Germany is £[£] each way (full load of 8 drums or [£] cylinders) Small cylinders typically 12kg of chlorine, large cylinders 45–65kg of chlorine 	65kg: [£] 45kg: [£] 12kg: [£] + UK distribution	N/A
Exel	<ul style="list-style-type: none"> Average cost of transporting cylinders within the UK £[£] 	71kg: [£] [£]	N/A

Source: Main parties' and third parties' written evidence.

*Air Products told us that its costs were round trip costs for delivery to a central UK location and that local distribution to the UK customer was shown separately.

26. The selling price per tonne that can be achieved through cylinders is markedly higher than that for drums (the main parties estimated price at £[£] per tonne for large and small cylinders). In theory, this could allow a higher margin to absorb transportation costs and maintain a profitable operation.

27. Much of the evidence we received was somewhat unclear in terms of transport costs for cylinders.

28. Gerling Holz told us that it was unable to provide a detailed breakdown of transport costs between cylinders and drums and currently only exported approximately [£] of packaged chlorine in drums to the UK.¹³ Gerling Holz estimated that transport costs were [£] from Germany to a central point in the UK. This excluded distribution within the UK and also excluded stock holding, handling, etc within the UK.

¹³Gerling Holz supplies one industrial user with chlorine in drums of a different grade and moisture content to that which can be sourced from the UK.

29. Information provided to us by Exel, which distributes chlorine drums and cylinders for Ineos Chlor, indicated that average UK transportation costs for cylinders were between £[redacted] depending on cylinder size.
30. Based on these estimates, transport costs alone would range from £[redacted] per tonne to £[redacted] per tonne, [redacted]—approximately [redacted] per cent—of an average selling price of £[redacted] per tonne. The transport cost to import cylinders into the UK alone would represent approximately [redacted] per cent of the selling price for cylinders. With chlorine production costs conceivably higher in Germany than in the UK, we found it likely that cylinders could not be imported from Germany without substantial margin erosion.
31. Importing drums and small (39kg) cylinders, according to Air Products' estimates of UK selling prices, would not be viable.¹⁴ Even assuming a 10 per cent price rise, such imports would still generate a negative marginal profit contribution. In relation to large cylinders, we noted that 71kg cylinders seemed to be logistically more attractive to transport and that it might be possible to import these competitively. However, this data did not take into account sales and marketing costs, storage costs in the UK or the costs associated with procuring/maintaining cylinders and drums. Such additional costs would have a negative impact on the marginal profitability of importing large cylinders.
32. Applying the main parties' estimated selling prices in the UK of £[redacted] per tonne for drums and £[redacted] per tonne for cylinders to Air Products' data confirms that importing drums and small cylinders would not be economically viable. Importing large cylinders might be more viable on this basis. However, we again observed that sales

¹⁴However, we noted that other types of small cylinders were better suited to being transported in bulk than the Air Products cylinders and were at less of a cost disadvantage.

and marketing costs, storage costs and the costs of procuring/maintaining cylinders would also need to be factored in, eroding marginal profit.

Views of the main parties

33. BOC provided figures that, it suggested, showed that a UK distributor would be able to transport chlorine to the UK, and then around the UK using its own distribution network, with similar distribution costs to BOC, or a Continental supplier would be able to operate a milk round delivery service at higher costs. These figures are reproduced in Tables 4 and 5. The main parties suggested that these figures showed:

- imports of cylinders were viable at current UK prices (around £[redacted] per tonne); and
- imports of drums would be viable in the event of a 10 to 15 per cent price increase on the current price of around £[redacted] per tonne.

TABLE 4 Main parties' estimate of costs to deliver into UK market using BOC distribution model

		£ per tonne			
Exchange rate	1.42	[redacted]	[redacted]	[redacted]	[redacted]
980kg drum	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
UK price £[redacted]/t	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
		[redacted]	[redacted]	[redacted]	[redacted]
71kg cylinder	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
UK price £[redacted]/t	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
		[redacted]	[redacted]	[redacted]	[redacted]
39kg cylinder	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
UK price £[redacted]/t	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
		[redacted]	[redacted]	[redacted]	[redacted]

Source: BOC.

TABLE 5 Main parties' estimate of costs to deliver into market using Ineos Chlor milk round model

	£ per tonne				
Exchange rate	1.42	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
980kg drum	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
UK price £[REDACTED]/t	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
71kg cylinder	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
UK price £[REDACTED]/t	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
39kg cylinder	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
UK price £[REDACTED]/t	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Source: BOC.

34. However, we noted that the figures assumed an exchange rate of €1.42/£. We also considered it unlikely that another company without BOC's infrastructure would be able to match the distribution costs suggested by BOC.

35. Table 6 shows the costs submitted by BOC corrected for the current exchange rate of €1.258/£ (0.795£/€) and using distribution cost information provided by Exel for the delivery service it provides to Ineos Chlor.¹⁵

TABLE 6 CC estimate of costs to deliver into market using current exchange rate and Exel distribution costs

Exchange rate	1.258	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
980 kg drum	Product price	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
UK price £[REDACTED]/T	Distribution to UK	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	UK haulage	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
		[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
71 kg cylinder	Product price	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
UK price £[REDACTED]/T	Distribution to UK	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	UK haulage	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
		[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
39 kg cylinder	Product price	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
UK price £[REDACTED]/T	Distribution to UK	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	UK haulage	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
		[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Source: CC analysis.

¹⁵Exel noted that if additional delivery volume could be added to the fleet then the increase in costs to make these deliveries would not be significant and the cost per unit delivered would reduce. However, we noted that it was likely that a new entrant would have less volume to distribute and therefore a new entrant's costs might be proportionately higher.

36. We found that, based on the data in Table 6, importing drums would be uneconomic unless prices rose substantially from current levels.
37. Our analysis, based on the evidence submitted to us, suggested that importing chlorine to the UK in drums could not be seen as a viable source of competition to a merged BOC/Target Business, even assuming a 5 to 10 per cent price rise following the merger. The cost of transporting drums to the UK, even at the lowest estimate submitted to us, was significantly higher than any savings realized in the chlorine production process on the Continent.
38. Our analysis also did not present a compelling economic case for a competitor to import packaged chlorine in cylinders. A potential importer would be aware of the risks it would face in entering into a long-term supply arrangement with a UK customer priced in pounds when servicing the contract with product priced in Euros.¹⁶ Whilst there might be some case for importing cylinders, we observed that profit margins may not be significant enough to justify the risks and that cylinders in any event represented only a small proportion ([X]) of the UK market for packaged chlorine.¹⁷

Conclusions on the economic viability of importing drums and cylinders of chlorine

39. In summary, it appears that for both drums and cylinders:
- transport costs within the UK represent a high proportion of UK selling prices; and
 - transport costs from Europe (which would, for imports, be incurred in addition to UK transport costs) appear very high compared with UK transport costs.

¹⁶We note that the £/€ exchange rate has continued to decline below the levels used in this appendix and also note that although an importer could hedge the price, this would further eat into the margin and render the business less attractive.

¹⁷See Appendix I, Tables 1 and 2. Cylinder share by volume in 2007 was [X] per cent.

40. Given our analysis, we found it extremely unlikely that importing packaged chlorine in drums would be economically viable, even in the event of a 5 to 10 per cent price rise. Third party data supported this view. The analysis we performed on the cost information supplied by the parties suggested that it might be possible to achieve a margin on some cylinders. However, we did not find the economic case particularly compelling and we also observed that cylinders represented only a small proportion of the overall UK market for packaged chlorine. We noted that our calculations of the case for importing cylinders were subject to uncertainty (increasing the economic risk of importing such cylinders). It therefore did not appear that importing packaged chlorine would be economically viable in meeting the majority of UK demand.

Further evidence from the parties on importing packaged chlorine

Air Products

41. Air Products estimated that a round trip from Barcelona to a central point in the North-West of the UK would be around £[REDACTED] for a fully loaded trailer, suggesting that, for a load of ten drums (which have a lower per kg selling price), this would be prohibitive from a cost point of view. Air Products' subsequent response confirmed that shipping costs for a 980kg drum would be [REDACTED]. Additional distribution costs within the UK would also apply, which it estimated at around £[REDACTED] for a large drum. These costs—implying a total transport cost of around £[REDACTED]—take the import costs well above the estimated UK selling price of £[REDACTED] per tonne. Further, the cost of raw materials and filling costs, estimated at [REDACTED] drum (around £[REDACTED] per tonne) mean that total costs, excluding sales and marketing, storage in the UK and any additional costs of drum containers would be around £[REDACTED], suggesting that importing drums from Spain would not be viable.
42. For cylinders, Air Products suggested that average ex-works selling price in the UK was £[REDACTED] for a small cylinder and £[REDACTED] for a large cylinder, with delivery charges

depending on the requirements of individual customers. This equates to £[redacted] per tonne, which appears to be broadly in line with the main parties' estimate of £[redacted] per tonne for small cylinders. However, Air Products' cost for a large cylinder is lower at £[redacted]. Air Products also estimated that Air Products' cost of a fully-loaded trailer travelling from Barcelona, Spain, to a central point in the North-West of England was £[redacted] for a round trip. Air Products provided a detailed breakdown of estimated costs which is shown in Table 7.

43. Additional distribution (transport) costs within the UK would also apply and are shown in Table 7 (estimated by Air Products to be £[redacted] for a 980kg drum, £[redacted] for a small cylinder and £[redacted] for a large cylinder. This appears to be broadly in line with UK distribution costs we received from Exel).

TABLE 7 Air Products breakdown of estimated costs to transport packaged chlorine to UK customers

	Small cylinders (39kg)	Large cylinders (71kg)	Drums (980 kg)
<i>€/tonne</i>			
Raw materials	[redacted]	[redacted]	[redacted]
Filling cost	[redacted]	[redacted]	[redacted]
Shipping	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]
<i>£/tonne (@.795£/€)</i>			
Raw materials	[redacted]	[redacted]	[redacted]
Filling cost	[redacted]	[redacted]	[redacted]
Shipping*	[redacted]	[redacted]	[redacted]
Total to UK	[redacted]	[redacted]	[redacted]
UK distribution	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]
Air products UK sales price (£/tonne)	[redacted]	[redacted]	[redacted]
Implied marginal profit contribution (£/tonne)	[redacted]	[redacted]	[redacted]
Margin (%)	[redacted]	[redacted]	[redacted]

Source: Air Products + CC analysis.

*Transport costs are based on transporting on a 40-foot trailer. This carries 10 drums, or 20 pallets of 18x71 kg cylinders (360 total), or 20 pallets of 12x39 kg cylinders (240 total).

Notes and assumptions:

1. Raw materials cost is based on the midpoint of the [redacted] per tonne cost of bulk chlorine in Spain.
2. Filling costs per tonne are based on combined raw material and fill cost data provided by Air Products of [redacted]. The assumed [redacted] raw materials cost is then stripped out.
3. Shipping costs based on prices per unit: [redacted].
4. UK distribution costs [redacted].
5. UK sales price based on average selling prices of [redacted].
6. Implied marginal profit contribution excludes sales and marketing costs, storage costs in the UK and costs of procuring/maintaining containers.

44. Air Products stated that high sea freight charges meant that it could not price as low as it would need to in order to be competitive in the UK market.

Albion

45. In its written evidence, Albion suggested that importing chlorine cylinders from Northern Europe was 'just about commercially possible, if not an attractive proposition', while importing drums 'was not economically viable'. Albion does not import packaged chlorine, nor does it transport cylinders, so it was unable to provide detailed costs for these activities. Albion estimated that the cost per mile for transporting chlorine drums within the UK was around £[REDACTED]. This was broadly in line with cost estimates received from Exel.

Air Liquide

46. Air Liquide told us that it had not conducted any analysis of the economic viability of importing packaged chlorine in either drums or cylinders. However, in additional evidence provided to us, it confirmed that its current contracted cost for importing from its [REDACTED] was currently around £[REDACTED] each way for a full load ([REDACTED] drum tanks or [REDACTED] cylinders). Based on a load of [REDACTED] cylinders,¹⁸ this would equate to £[REDACTED] per tonne. Costs per tonne escalate more markedly for smaller cylinder sizes. For 45kg cylinders, the cost would be £[REDACTED] per tonne and for the smallest (12kg) cylinders, £[REDACTED] per tonne. Assuming a £[REDACTED] per tonne selling price, transport costs to the UK would represent somewhere between [REDACTED] per cent and [REDACTED] per cent of the sale price, depending on cylinder size. For large cylinders, this would not represent as significant an extra cost as other third parties indicated in their evidence. The cost for smaller cylinders is, however, more in line with the lower end estimates provided by other third parties.

¹⁸Air Liquide, describes a 'small' cylinder to generally be of 10 litres or less water capacity which will contain up to 12kg of chlorine. A 'large' cylinder typically has 47 to 50 litres water capacity, which would typically contain 45 to 65kg of chlorine.

47. Additional transport costs within the UK, based on Air Liquide's current contracted costs, are approximately £[redacted] for a round trip (£[redacted] per km per cylinder based on a full lorry carrying [redacted] cylinders). This is significantly higher than data provided by Exel, which suggests that a lorry capable of carrying [redacted] x 33kg cylinders, or [redacted] x 71kg cylinders would be charged at a fixed weekly fee equating to £[redacted] per mile.¹⁹
- [redacted]

Gerling Holz

48. Gerling Holz told us it currently only distributed a small number of drums into the UK for one customer. The company estimated that the transportation cost (based on a full truck from Hanau/Biebesheim in Germany to a central point in the UK) was [redacted]. For a 1,000kg drum, this equates to £[redacted] per drum in transportation costs (excluding local distribution, stock holding and handling). Gerling Holz sells drums in the UK [redacted]. Thus, for drums, transportation costs to the UK would account for somewhere between [redacted] per cent of Gerling Holz's estimated selling price. Assuming a more competitive selling price in line with the market [redacted], transport costs to the UK would represent around [redacted] per cent of the selling price.

BOC

49. BOC told us that there was considerable variance in the transport costs for cylinders and drums within mainland Great Britain and to Ireland. BOC estimated that the cost per cylinder (delivered) in Great Britain was £[redacted], compared with the cost per cylinder delivered in Ireland of £[redacted]—almost double the price. A similar difference was noted for drums, which were estimated by BOC to cost £[redacted] per drum in Great Britain compared with £[redacted] in Ireland. We consider that this further demonstrated the

¹⁹Exel told us that a Type 1 lorry to carry cylinders would be charged at £[redacted] per mile based on [redacted] miles per week, with mileage above/below the mileage limit charged or credited at £[redacted] per mile.

significant transport costs associated with importing packaged chlorine generally (because all packaged chlorine was imported into the 'island of Ireland').

50. We also noted BOC's valuation model for the purchase of the Ineos Chlor business, which assumed a haulage cost ratio as a percentage of sales of [X] per cent for haulage within the UK. In addition, evidence from third parties, outlined in paragraphs 19 to 32 and 41 to 48 indicated that transport of imported cylinders to the UK represented a large proportion of the selling price. This also suggested that overall transport costs could feasibly account for a very significant proportion of sales, such that margins would be eroded substantially and the ability of importers to compete on price would be uncertain.