

Buyer power

1. In this appendix we present the evidence on:
 - (a) buyer power before the merger;
 - (b) whether, if there were customers that enjoyed buyer power, they could protect those customers that did not; and
 - (c) the extent to which buyers could influence the terms of supply (ie what were buyers' 'outside options').

Evidence of buyer power before the merger

2. We examined volume, price and margin data to see whether larger customers currently received lower prices and whether Ineos Chlor's margins were lower for larger customers. A relationship between volume and prices or margins may indicate that buyer power was present and may require us to examine the possibility of countervailing buyer power further.

Correlation between the volume of chlorine purchased and the price

3. We used an annual aggregation of customer-level sales revenue and volume data for BOC and Ineos Chlor to estimate the weighted average revenue per tonne (WART) of chlorine generated from each customer, by form of supply (ie cylinders and drums), in 2007.¹ We used WART as a proxy measure for weighted average selling price per tonne each customer receives.²

¹We excluded Albion and Gerling Holz from this analysis due to the small number of customer observations. We excluded Air Products because it did not provide customer-level data. We undertook the analysis on 2007 prices due to the significant increase in packaged chlorine prices over the period 2004 to 2007 which might affect the observed correlation between price and volume.

²We derived the weighted average revenue per tonne of supply for each customer for each year, weighting the importance of each individual transaction using sales revenue. The limitation with this approach was that it assumed that each individual customer paid a single price within a given period. In reality, a customer might be charged different prices for multiple transactions within that period and also might be charged different prices for different units of the same product within the same transaction. In essence, we were 'smoothing out' some of the variation in the average revenue per tonne estimate. Relationships between price and volume tend to be non-linear (ie price declines but at a decreasing rate as volume increases). We therefore undertook our correlation analysis using the natural logarithm of WART. Transforming the data in this way enabled us

4. Figures 1 and 2 show the correlation between the log of WART and volumes purchased, by format of supply, for Ineos Chlor and BOC customers respectively.

FIGURE 1

Correlation between WART and volume: Ineos Chlor



Source: CC analysis based on Ineos Chlor's data.

FIGURE 2

Correlation between WART and volume: BOC



Source: CC analysis based on BOC's data.

5. We examined pair-wise correlation (which reflects the degree of linear relationship) between WART and volumes using the Pearson correlation coefficient to test for statistical significance.³ A statistically significant negative coefficient indicates that there is strong evidence that WART decreases as volume increases. The results are set out in Table 1.
6. We found statistically significant [✂].

to test for a linear correlation between WART and volume and also reduced the risk of our analysis being biased by large WART outliers.

³Pearson's correlation ranges from +1 to -1 and reflects the degree of linear relationship between two variables. A reported coefficient will indicate whether the correlation between two measures is likely to be positive, negative, or not significant. A coefficient of +1 indicates that there is a perfect positive linear correlation between two variables. Likewise, a correlation of -1 indicates that there is a perfect negative linear relationship between two variables. A correlation of 0 means there is no linear relationship between the two variables. Correlations are rarely if ever 0, 1, or -1.

TABLE 1 **Correlation coefficients by company and form of supply**

Company	Product	Number of observations	Coefficient
BOC	Cylinders	[0.00]	[0.00]
Ineos Chlor	Cylinders	[0.00]	[0.00]
BOC+Ineos Chlor	Cylinders	[0.00]	[0.00]
Ineos Chlor	Drums	[0.00]	[0.00]
BOC	Drums	[0.00]	[0.00]
BOC+Ineos Chlor	Drums	[0.00]	[0.00]

Source: CC analysis based on BOC and Ineos Chlor's data.

Notes:

1. Asterisks indicate that the coefficient is significantly different from zero with the following confidence levels: *90%, **95%, ***99%.
2. [0.00]

7. Figure 3 and Table 2 show the same analysis as undertaken above, split by customer type, using combined BOC and Ineos Chlor data. We found evidence of a statistically significant [0.00], although the evidence for water companies was weaker. For drums, we only found statistically significant evidence of a [0.00].

FIGURE 3

Correlation between WART and volume: customer types

[0.00]

Source: CC analysis based on BOC and Ineos Chlor's data.

Note: WART-weighted average revenue per tonne (£).

TABLE 2 **Correlation coefficients by customer type**

Customer	Product	Number of observations	Coefficient
Industrial	Cylinders	[0.00]	[0.00]
Water	Cylinders	[0.00]	[0.00]
Industrial	Drums	[0.00]	[0.00]
Water	Drums	[0.00]	[0.00]

Source: CC analysis based on BOC and Ineos Chlor's data.

Note: Asterisks indicate that the coefficient is significantly different from zero with the following confidence levels: *90%, **95%, ***99%.

Correlation between the volume of chlorine purchased and the gross margin

8. While a lower price associated with higher volumes might be the result of buyer power, it is also consistent with volume-related cost savings. We therefore undertook the same analysis using Ineos Chlor's gross margins rather than price. This captured

haulage costs and the variable costs associated with the chlorine product.⁴ BOC did not provide customer transaction level data on margins.

9. We used the percentage gross margin and tested for correlation with volumes purchased using Pearson correlation coefficients. We did not take the log as the relationship between variable gross profit margin and volume was likely to be linear.⁵

FIGURE 4

Correlation between Ineos Chlor's gross margin and volume

[✂]

Source: CC analysis based on Ineos Chlor's data.

10. Table 3 shows the Pearson correlation coefficients, along with statistical significance. We found some evidence of [✂]. This result is not consistent with the exercise of buying power by larger customers. Other things equal, we would expect to find lower margins earned for higher volumes sold. We found no evidence of any correlation between the volume of drum purchases and gross margins earned.

TABLE 3 Correlation coefficients

Customer	Product	Number of observations	Coefficient
Industrial	Cylinder	[✂]	[✂]
Water	Cylinder	[✂]	[✂]
All customers	Cylinder	[✂]	[✂]
Industrial	Drum	[✂]	[✂]
Water	Drum	[✂]	[✂]
All customers	Drum	[✂]	[✂]

Source: CC analysis based on Ineos Chlor's data.

Note: Asterisks indicate that the coefficient is significantly different from zero with the following confidence levels: *90%, **95%, ***99%.

⁴Ineos Chlor [✂].

⁵If fixed costs were included in our profit measure a non-linear measure would be more appropriate. We note that undertaking the analysis using the logarithm of gross margin generates very similar results to those reported here.

The risk of discrimination against smaller customers

11. A key criticism of the countervailing buyer power defence is that some of the parties' customers may not enjoy buyer power. Given that the customer base for both parties is quite large (including numerous industrial customers)⁶ it is unlikely that all customers will enjoy buyer power. Further, there is no particular reason that buyer power held by some customers must necessarily affect the price (and non-price) terms available to other customers. There are circumstances in which buyer power may prevent price rises for all customers, such as:
- (a) the existence of one market price, so that the buyer power of large firms drives down the price for all firms;
 - (b) large buyers sponsor a new entrant which supplies the wider market;⁷ and
 - (c) the ability to arbitrage.
12. Prices of packaged chlorine are negotiated individually. As such there is no market price, and the bargaining power of any one customer is unlikely to affect other customers' prices. We also found it unlikely that buyers would sponsor new entry (see paragraphs 14 to 19) and the scope for arbitrage was low.

The impact of the merger on buyers' outside options

13. Although all the evidence above indicated countervailing buyer power might not constrain the merged entity, for completeness we addressed further arguments put forward by the parties and explored the ability and incentives of buyers to constrain BOC/Target Business in the event of a price rise following the merger. We considered buyers' ability to:
- (a) sponsor entry or expansion by others;

⁶BOC has [X] customers and Ineos Chlor has [X] customers.

⁷Ineos Chlor told us that if some larger customers sponsored entry this may protect smaller customers.

- (b) reduce, or credibly threaten to reduce, their purchases from the merged entity by switching, or credibly threatening to switch, some or all of their purchases to rival distributors (including imports) or substitute products;
- (c) form a consortium to increase their purchasing power; and/or
- (d) otherwise impose costs on the merged entity.

Buyers' ability to enter or sponsor new entry or expansion

14. The parties maintained that they did not consider sponsored entry by customers was required to stimulate entry but the role of buyers in encouraging entry should not be ignored. The parties told us that several large sophisticated customers were of a scale sufficient to guarantee the financial viability of a new entrant, or to encourage the expansion of a smaller competitor. They also stated that winning a single contract to supply one of the larger water companies would enable a sponsored new entrant to recover its sunk costs. Ineos Chlor told us that a customer would have to provide volume commitments for a certain period (two years) but argued that this would not be much of a sacrifice because, although customers had the ability to move volumes from one supplier to another during the contract period, this did not happen frequently. Further, the parties emphasized the point that in the event of a price rise customers would investigate alternative sources of supply.

15. Customers might be able to constrain the merged entity by fostering new entry or expansion, for example by offering new or small distributors guaranteed volumes or a long-term contract. This could insulate such new distributors to a certain extent from incumbent firms responding aggressively to their entry by cutting prices, and could guarantee that they would recover all or at least some of their sunk entry costs (ie those investments which are irrecoverable should the new entrant subsequently be forced to exit the market).

16. We looked for examples of sponsored entry or attempts by potential entrants to secure sponsorship. There were no examples of sponsored entry [REDACTED].⁸
17. Theoretically, joining a purchasing consortium may also facilitate sponsorship, as individual customers may be too small or may not be prepared to risk the sufficient level of volume necessary. [A customer] told us that although water companies had to be careful in joining consortia to abide by relevant UK and European competition legislation, in theory, customers could re-tender at the same time to take advantage of their collective volume requirements. [A customer] said that it had used this tactic when purchasing other chemicals.⁹ However, it also told us that although this strategy was theoretically feasible, there were practical problems related to differing individual customer specification requirements. Gerling Holz also told us that it experienced problems with contracts (typically three to five years) being up for renewal at different times.
18. Further, a prospective entrant (or competitor considering expansion) may find non-contractual assurances from a customer, in isolation, to be an insufficient basis for a significant investment. Contractual commitments may require a change in customers' current procurement practices, which appear typically to consist of flexible agreements (ie framework agreements). The main parties, however, told us that historically there was limited tendency for customers to move volumes around within a fixed contract period.
19. Although it might be theoretically possible to sponsor entry, we did not obtain sufficient evidence to be satisfied that it was likely that customers would consider this strategy or would cooperate to do so.

⁸[REDACTED]
⁹[REDACTED]

Buyers' ability to switch to alternatives

20. We considered whether the buyers' ability to switch to alternatives (or credibly threaten to do so) could be a means through which buyers could constrain BOC/Target Business. We found that customers' ability to switch to alternative water disinfection methods was unlikely to provide a sufficient constraint (see Appendix E). We also found customers' ability to switch to alternative UK distributors (Albion or Air Products), imports or a new entrant was also unlikely to provide a sufficient constraint (see Appendices G and F).

Forming a purchasing consortium

21. The main parties cited the use of joint purchasing agreements between water companies¹⁰ to drive down supplier prices and improve efficiency, ie an increase in volume would increase customers bargaining strength.¹¹ On the basis of Ineos Chlor's margin data, these lower prices did not seem to reflect buyer power rather than volume-related cost discounts.
22. Given the size and range of the customer base, it seemed unlikely that they would all enter the type of consortia that are formed by some water companies and any buyer power held by some customers would not necessarily affect the terms available to other customers.

Buyers' ability to punish suppliers in alternative ways

23. Customers may be able to constrain packaged chlorine prices if they are able to impose substantial costs on BOC/Target Business. For example, buyers (especially water companies) appeared to purchase a portfolio of products from distributors and

¹⁰Such as that between Bristol Water, Bournemouth Water and Wessex Water, Scottish/Northumbrian Water and Three Valleys Water. Ineos Chlor told us that it believed that Scottish and Northumbrian Water formed their buying consortium around 2005 whilst other buying consortia formation pre-dated 2005. It did not believe that they were formed in a response to a specific change in the market.

¹¹Ineos Chlor told us that not 'all' smaller customers had to form consortia to exert buyer power.

an increase in the price of packaged chlorine could be offset by reducing purchases of other products, so as to make the overall effect unprofitable for the distributor. The parties made this argument.

24. We were told that customers often negotiate the purchase of chlorine in isolation,¹² customers did not appear to have been used this bargaining tool to date and we did not see any evidence that led us to believe this would change after the merger.

¹²[REDACTED]