

**REVIEW OF UNDERTAKINGS GIVEN TO THE COMPETITION
COMMISSION BY KEMIRA GROWHOW OYJ, KEMIRA GROWHOW
HOLDINGS LIMITED, KEMIRA GROWHOW UK LIMITED, TERRA
INDUSTRIES INC AND TERRA NITROGEN (UK) LIMITED**

Final report

Published: 28 April 2011

The Competition Commission has excluded from this published version of the report information which the 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 [X]. Non-sensitive alternative wording is also indicated in square brackets.

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Appendix A: Switching analysis

1. Summary

Background

- 1.1 In July 2007, the Competition Commission's (CC's) report (our 2007 report)¹ was published on the anticipated joint venture (the JV) between Kemira GrowHow Oyj (Kemira) and Terra Industries Inc (Terra). The CC concluded that the JV constituted a relevant merger situation which might be expected to result in a substantial lessening of competition (SLC) in a number of markets in which Kemira and Terra overlapped.
- 1.2 One of these markets was the market for the supply of carbon dioxide (CO₂) to distributors in the UK. In this market, the CC found an SLC as a result of unilateral effects, and that in the absence of remedies this was expected to result in higher ex-works prices for CO₂ in the UK.² Prior to the merger, CO₂ was liquefied by Terra at two ammonia plants located at Severnside (near Bristol) and Billingham (in Teesside) and Terra was active in the wholesale supply of liquid CO₂. Kemira sold exclusively to Air Liquide UK Limited (Air Liquide) raw CO₂ produced at the Ince ammonia plant in Cheshire;³ Kemira then liquefied this CO₂ under a long-term operating and maintenance contract with Air Liquide (the Ince Agreement) in a liquefaction plant owned by Air Liquide on the Ince site.
- 1.3 The CC concluded that the SLC in the market for the supply of CO₂ to distributors could be remedied by accepting suitable undertakings as regards the Ince Agreement between Kemira and Air Liquide. This remedy would ensure that the incentives facing the JV were broadly similar to those facing Terra before the merger. Terra had already informed the CC that it intended to close its CO₂-producing plant at Severnside.
- 1.4 On 11 September 2007, the CC accepted undertakings (the Undertakings) given by Kemira, Kemira GrowHow Holdings Limited, Kemira GrowHow UK Limited, Terra and Terra Nitrogen (UK) Limited (jointly, the parties). A copy of the Undertakings is available on the CC's website,⁴ and the key provisions relating to CO₂ are set out in paragraphs 7 to 11.⁵ On 14 September 2007 the JV was completed, creating GrowHow UK Limited (GrowHow).
- 1.5 Under the Enterprise Act 2002 (the Act), the Office of Fair Trading (OFT) has a duty to consider whether, by reason of any change of circumstances, existing undertakings are no longer appropriate and either the relevant parties can be released from undertakings or the undertakings need to be varied or superseded.⁶ If the OFT concludes that change may be required to existing undertakings, it provides advice to the CC regarding the changes of circumstance. It is then for the CC to decide whether the existing undertakings are no longer appropriate, and, if so, whether they should be superseded, varied or released.

¹[Kemira GrowHow Oyj and Terra Industries Inc merger inquiry: a report on the anticipated joint venture between Kemira GrowHow Oyj and Terra Industries Inc](#), CC, 11 July 2007.

²Our 2007 report, paragraph 10.74.

³CO₂ is a by-product of the production of ammonia, the fermentation process at bioethanol plants and other chemical processes (eg hydrogen production and grain fermentation). As in our 2007 report, we refer to the CO₂ produced by these sources as raw CO₂. We refer to liquid CO₂ as raw CO₂ that has been purified and liquefied in a liquefaction plant.

⁴www.competition-commission.org.uk/inquiries/ref2007/kemira/pdf/final_undertakings.pdf.

⁵Paragraph 1 of the Undertakings covers interpretation and definition; paragraph 2 covers commencement and duration; and paragraphs 3 to 6 cover the divestment undertakings relating to the other markets in which the CC found SLCs.

⁶[Section 92\(2\)\(b\) Enterprise Act 2002](#).

- 1.6 On 10 July 2009, GrowHow submitted a finalized request to the OFT that there had been a change of circumstances and that the parties should be released from paragraphs 7 to 11 of the Undertakings.
- 1.7 On 18 November 2009, the OFT sent its advice to the CC. The OFT's advice was published at the same time as our provisional decision.⁷ The OFT identified the following change of circumstances: (i) the closure of the Severnside plant; (ii) the sale to Azelis UK Limited (Azelis) of the CO₂ liquefaction plant at Billingham; and (iii) the acquisition of Kemira by Yara International ASA (Yara). It recommended that the parties should be released from paragraphs 7 and 11 of the Undertakings, but that the obligations in paragraphs 8 to 10 of the Undertakings should remain in force.
- 1.8 Our review was suspended for a considerable period when on 15 February 2010, Yara announced that it intended to acquire Terra. On 15 April 2010, CF Industries Incorporated, a US-based fertilizer company, acquired Terra. After receiving additional information concerning the acquisition, the CC announced the resumption of the review on 8 June 2010. Our provisional decision was published on 9 November 2010.

Our decision

- 1.9 Our 2007 report found an SLC in the market for supply of CO₂ to distributors as a result of unilateral effects. Theories of harm were identified which related to actions of the JV in relation to both raw CO₂ and liquid CO₂. We considered the change of circumstances identified by the OFT and assessed whether each of the theories of harm identified in our 2007 report were still likely to arise as a result.
- 1.10 We found that, because GrowHow has divested the liquefaction plant at Billingham and the Severnside liquefaction plant has closed, GrowHow is neither able to raise ex-works prices for liquid CO₂ at Billingham and Severnside nor is it incentivized to curtail the supply of raw CO₂ at Ince to maximize liquid CO₂ sales at other plants.
- 1.11 However, we found that GrowHow would still be able to threaten to terminate the Ince Agreement in order to raise the price of raw CO₂ because:
 - (a) For the foreseeable future, there are insufficient alternative existing sources of liquid CO₂ at a price that can constrain the price of raw CO₂ at Ince. Alternative spare capacity is either expensive, cheaper in terms of production costs but uncertain in terms of supply price and available quantity, and/or a number of those other sources are owned by a party which jointly controls GrowHow and are therefore unlikely to act as a constraint.
 - (b) A new liquefaction plant could not be built on a timely basis such that it could constrain the price of raw CO₂ at Ince.
- 1.12 We therefore concluded that it is not appropriate to vary or release the obligations in paragraphs 8 to 10 of the Undertakings. We found that the divestiture of the Billingham liquefaction plant to Azelis is not an effective remedy for the remaining theory of harm in the SLC because it has been undermined by call options that Yara has on much of the capacity at Billingham.

⁷Our provisional decision was published on 9 November 2010:

www.competition-commission.org.uk/inquiries/ref2010/kemiraterra/pdf/provisional_decision.pdf.

The OFT's advice can be found at: www.of.gov.uk/shared_of/mergers_ea02/2010/Kemira-Terra-advice.pdf.

- 1.13 However, we found that two variations should be made to the Undertakings:
- (a) As a result of the change of circumstances, the parties should be released from the confidentiality obligations in paragraph 7 of the Undertakings. This is because GrowHow has divested the Billingham liquefaction plant.
 - (b) Paragraph 11 of the Undertakings no longer has practical effect; for the avoidance of doubt and good administrative practice, we will release the parties from the obligations in this paragraph of the Undertakings.

Intention to release paragraphs 7 and 11 of the Undertakings

- 1.14 At the same time as publication of this final report, we are publishing a notice of intention to release paragraphs 7 and 11 of the Undertakings for the reasons given in paragraph 1.13. The intention to release paragraphs 7 and 11 of the Undertakings will be consulted upon for 15 days, as contemplated in Schedule 10 of the Act.

2. Introduction

- 2.1 This report sets out our decision regarding our review of the Undertakings in light of the change of circumstances identified by the OFT. In this report we set out:
- (a) background, including the findings of our 2007 report, the Undertakings, and an overview of developments since our 2007 report (Section 3);
 - (b) the OFT's advice to the CC, including GrowHow's request for review of the Undertakings and our view on jurisdictional issues raised by GrowHow (Section 4);
 - (c) our assessment of whether the change of circumstances make it appropriate to vary the Undertakings (Section 5); and
 - (d) our conclusion (Section 6).

Legal framework

- 2.2 The Act provides the CC with the power to vary, supersede or release an undertaking given to it either on direct application or acting on the advice of the OFT that by reason of a change of circumstances it is necessary to make a change to undertakings.⁸
- 2.3 The CC and the OFT have published a Memorandum of Understanding (MOU) on the variation and termination of merger, monopoly and market undertakings and orders under the Act.⁹ The agreed procedure provides that, first, the OFT will consider as required by the Act whether there has been a 'change of circumstances', and second, if there has been, what action should be taken. It will then submit its advice to the CC. The CC will then assess the OFT's advice and make its own determination on what action to take in the light of the OFT's advice.

⁸The Act, sections 82(5) and 92. In practice, the CC does not deal with direct applications because of the procedure agreed in the Memorandum of Understanding between the CC and the OFT (see paragraph 2.3).

⁹www.competition-commission.org.uk/about_us/our_organisation/workstreams/pdf/mou_between_of_t_and_cc.pdf. This MOU was updated on 10 March 2011.

- 2.4 The CC in carrying out its review of undertakings has to consider the OFT's advice and interested parties' representations, and take into account the developments in the relevant market that have occurred since the undertakings were accepted. In this, it does not seek to review the original SLC decision and remedies on the basis of the evidence that was available at the time of the original inquiry.

Conduct of the review

- 2.5 In this review, as set out in the MOU, we reviewed the OFT's advice and considered whether sufficient information and analysis was made available to allow us to reach a decision.
- 2.6 Due to the complexity of some of the contractual arrangements between CO₂ suppliers in this market and a number of further developments during the review (see, for example, paragraph 3.24(c)), we found it necessary to request further evidence from a number of parties. Although we have no formal powers to gather information in a review of undertakings, we sought information from, and engaged with, GrowHow, Yara, Air Liquide, Azelis, BOC and the European Commission team that assessed the acquisition of Kemira by Yara in 2007.
- 2.7 Our review was suspended for a considerable period when on 15 February 2010, Yara announced that it intended to acquire Terra. Because of the potential scrutiny of this merger by the European Commission, and the significant impact on the UK market for CO₂ should it proceed, we considered that it would not be reasonably practicable to continue with the review. As a result, on 11 March 2010 the CC announced its decision to suspend the review until the uncertainties surrounding GrowHow were resolved. On 15 April 2010, CF Industries Incorporated, a US-based fertilizer company, acquired Terra. After receiving additional information concerning the acquisition, the CC announced the resumption of the review on 8 June 2010.
- 2.8 We published a provisional decision on 9 November 2010 and considered responses from a number of parties.

3. Background

- 3.1 In this section, we set out:

- (a) the findings of our 2007 report;
- (b) the Undertakings; and
- (c) background to developments since our 2007 report.

Our 2007 report

- 3.2 In 2007, the CC considered the anticipated JV (which became GrowHow following completion) between Kemira and Terra. The transaction comprised the merger of the parties' UK fertilizer businesses, including the production and sale of by-products and intermediate products for the manufacture of fertilizers. The parties overlapped in the production and sale of certain types of fertilizers, nitric acid, ammonia and raw CO₂.
- 3.3 The CC published its final report on 11 July 2007.
- 3.4 The CC found that the JV might be expected to result in an SLC in the markets for nitric acid (of 58 to 60 per cent concentration), aqueous ammonia and anhydrous

ammonia ('the relevant process chemicals'). The CC remedied these SLCs by requiring Kemira to divest its business relating to the relevant process chemicals.

- 3.5 The CC also found that the JV might be expected to result in an SLC in the market for the supply of CO₂ to distributors in the UK as a result of unilateral effects, and that in the absence of remedies this was expected to result in higher ex-works prices for CO₂ in the UK.¹⁰ The CC found that Kemira and Terra had a high combined share of the market for the supply of CO₂ to distributors in the UK. Prior to the merger, CO₂ was liquefied by Terra at two ammonia plants located at Severnside (near Bristol) and Billingham (in Teesside), and Terra was active in the wholesale supply of liquid CO₂. Kemira sold exclusively to Air Liquide raw CO₂ produced at the Ince ammonia plant in Cheshire; Kemira then liquefied this CO₂ under the Ince Agreement¹¹ in a liquefaction plant owned by Air Liquide on the Ince site.¹² The CC found that to be commercially usable the raw CO₂ had to be purified and liquefied and that the ammonia production process, as operated by the parties at Severnside, Billingham and Ince, was one of the most effective sources of CO₂, resulting in relatively low purification costs.
- 3.6 The parties had argued that there was no overlap in their activities. They told the CC that although Kemira produced raw CO₂ 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 CO₂. They said that Terra, in contrast, produced raw CO₂ and liquefied it for onward sale to distributors.¹³
- 3.7 The CC considered a number of remedies to the SLC in the market for the supply of CO₂ to distributors in the UK, including divestiture, price control and prohibition.¹⁴ It concluded that any price control remedy was likely to be ineffective, and that prohibition would be disproportionate. It considered the divestiture of Terra's CO₂ liquefaction facilities as a remedy, and although it considered that this remedy would be effective, it found that it would be more restrictive and would impose a higher cost than a remedy which would strengthen the contractual commitments in the Ince Agreement. The CC found that, by ensuring that CO₂ from the Ince site reached the market in broadly the same way and on broadly similar terms as before the JV, the remedy would be effective in ensuring that the incentives facing the JV would be broadly the same as Terra's incentives pre-merger.¹⁵ To this end, the CC sought undertakings from the parties in relation to commitments concerning certain aspects of the Ince Agreement.

The Undertakings

- 3.8 Paragraphs 7 to 11 of the Undertakings included the following provisions in relation to CO₂:
- (a) not to terminate the Ince Agreement, except for due cause and subject to OFT approval (paragraph 8 of the Undertakings);
 - (b) to renew the lease under equivalent terms and conditions to those currently in force (paragraph 8);

¹⁰Our 2007 report, paragraph 10.74.

¹¹A long-term operating and maintenance contract with Air Liquide.

¹²Air Liquide leases the land on which its liquefaction plant stands from Kemira.

¹³Our 2007 report, paragraph 10.41.

¹⁴Our 2007 report, paragraphs 15.68–15.104.

¹⁵Our 2007 report, paragraph 15.68.

- (c) to give Air Liquide access to CO₂ up to the annual capacity of the plant (paragraph 9);
- (d) to allow Air Liquide to demand up to the maximum amount of liquid CO₂ that can be produced by the liquefaction plant on a daily basis, within the plant's annual capacity limit (paragraph 10);
- (e) to put in place measures preventing the communication of commercial information relating to CO₂ produced at Ince (the Confidentiality Guidelines), including, in particular, information relating to offtake, costs and pricing, to personnel involved in commercial negotiations in relation to CO₂ produced at Billingham and Severnside, and vice versa (paragraph 7); and
- (f) to offer new terms in relation to specific aspects of the Ince Agreement (paragraph 11). This paragraph was intended to facilitate negotiation of the Ince Agreement and had a limited duration of three months.

3.9 The Undertakings were accepted by the CC on 11 September 2007, and the JV was completed on 14 September 2007 and given the name GrowHow. In compliance with the Undertakings:

- (a) The Ince Agreement was renegotiated and signed on 11 December 2007. The renegotiated Ince Agreement has a [redacted] notice period and among other things sets (i) the price for raw CO₂ until [redacted] at £[redacted] per tonne (escalating over time), and from [redacted] at £[redacted] per tonne for the first [redacted] tonnes and £[redacted] per tonne thereafter (the first [redacted] tonnes are a 'take-or-pay' arrangement, although Air Liquide is not liable to contribute towards GrowHow's variable costs of production where these have not been incurred); and (ii) the fixed cost fee that Air Liquide shall pay GrowHow at £[redacted] per year (escalating over time).
- (b) The Confidentiality Guidelines were approved by the CC in December 2007 and are published on the CC's website.¹⁶ The Confidentiality Guidelines were applicable from the date of approval by the CC until such time as either (i) the JV had divested the CO₂ liquefaction plant at Billingham and also permanently ceased production of raw CO₂ at Severnside or (ii) the OFT notified the JV in writing that the Confidentiality Guidelines were no longer necessary.¹⁷

Developments since our 2007 report

3.10 In this section we provide some background on four developments since our 2007 report:

- (a) the acquisition of Kemira by Yara and the resulting divestiture of the Billingham liquefaction plant to Azelis;
- (b) Yara's supply agreements for liquid CO₂ from Azelis's Billingham plant;
- (c) the closure of the Severnside plant; and
- (d) changes in sales of liquid CO₂ and capacity of liquid CO₂ production.

¹⁶www.competition-commission.org.uk/inquiries/ref2007/kemira/pdf/confidentiality_policy_guidelines.pdf.

¹⁷The first of the criteria setting out the limited duration of the Confidentiality Guidelines was not set out in the Undertakings (see paragraph 2.1 of the Confidentiality Guidelines).

Acquisition of Kemira by Yara

- 3.11 Independently from the formation of the JV, on 18 July 2007 (just prior to the publication of our 2007 report) Yara announced its intention to acquire sole control of Kemira. Yara produced CO₂ in Continental Europe, imported liquid CO₂ into the UK, and was also involved in the wholesaling and distribution of CO₂ in the UK.
- 3.12 The Yara/Kemira transaction fell under the exclusive jurisdiction of the European Commission. Our 2007 report made reference to this difference in jurisdiction, but said that from the point of view of the CC's inquiry, the transaction would have no effect on any of the markets it examined 'unless and until merger clearances have been obtained'.¹⁸ The CC drew the attention of the European Commission to the findings in our 2007 report.
- 3.13 The European Commission investigated the Yara/Kemira transaction¹⁹ and found that it would lead to a significant impediment of effective competition in the markets for the supply of liquid CO₂ to distributors and the supply of liquid CO₂ to end-users in the UK.
- 3.14 By way of a remedy, Yara offered to procure the divestment of Terra's liquefaction plant at Billingham,²⁰ to procure that GrowHow enter into an agreement for the supply of raw CO₂ with the purchaser of the liquefaction plant, with a possible additional agreement for GrowHow to manage and operate the liquefaction plant on behalf of the purchaser.
- 3.15 The European Commission accepted this remedy and the transaction was cleared subject to phase 1 commitments on 21 September 2007, shortly after the acceptance of the Undertakings (on 11 September 2007) and the formation of the JV (on 14 September 2007).
- 3.16 On 1 June 2008 the Billingham liquefaction plant was sold to Azelis in fulfilment of the commitments to the European Commission in paragraph 3.14. As part of this divestment an operating, management, maintenance and supply agreement for the Billingham liquefaction plant was signed on 1 June 2008 between GrowHow and Azelis (the Billingham Agreement) whereby GrowHow is responsible for supplying raw CO₂ to Azelis and for operating, managing and maintaining the Billingham liquefaction plant on behalf of Azelis. The Billingham Agreement has a term of [X] years and, among other things, sets the price for raw CO₂ at £[X] per tonne and contains a mechanism for adjusting the raw CO₂ price.

Yara's supply agreements with Azelis for liquid CO₂ at Billingham

- 3.17 Yara UK Limited²¹ had a supply agreement with Terra Nitrogen (UK) Limited for liquid CO₂ from Billingham originally signed on 22 December 2003. This agreement was amended in May 2008 as part of the sale of the CO₂ business at Billingham to Azelis. The agreement was taken on by Azelis [X]. The supply terms of the agreement provided for an obligation to supply up to [X] tonnes of liquid CO₂ to Yara each year, but Yara has no obligation to take any of this volume. This provision was amended in May 2008 so that Azelis's obligation to Yara was [X]. The price to Yara [X].

¹⁸Our 2007 report, paragraph 5.9.

¹⁹Case no COMP/M.4730 Yara/Kemira GrowHow.

²⁰Terra was not itself a party to the Yara/Kemira transaction but was a joint venture partner with Kemira in the UK, through GrowHow.

²¹For simplicity, we refer to both Yara International ASA and Yara UK Limited as Yara.

- 3.18 In addition, Yara had a further supply agreement with Terra Nitrogen (UK) Limited for liquid CO₂ from the Billingham plant originally signed on 31 December 2001. As part of the sale of the CO₂ business at Billingham to Azelis, this agreement was also taken on by Azelis and amended in May 2008 to [REDACTED]. The supply terms of the agreement give Yara an option to purchase up to [REDACTED] tonnes per month (ie [REDACTED] tonnes per year) from Billingham. [REDACTED] The price is [REDACTED].²²
- 3.19 We refer collectively to the two supply agreements between Yara and Azelis described in paragraphs 3.17 and 3.18 as 'Yara's Billingham call option'.

Closure of Severnside plant

- 3.20 The Severnside facility formerly owned by Terra was closed permanently by GrowHow on 31 January 2008. This closure had been contemplated in the merger plans considered in our 2007 report.²³

Changes in sales of liquid CO₂ and capacity of liquid CO₂ production

- 3.21 At the time of our 2007 report, the JV estimated that total UK retail sales of liquid CO₂ had fallen from around 450,000 tonnes a year in 2002 to around 400,000 tonnes a year in 2006. Our 2007 report set out that the largest users of CO₂ are the food and beverage sectors and the nuclear industry. CO₂ is also used in horticulture, the oil and gas industry and in chemical industries.
- 3.22 We were told by several parties that the demand for liquid CO₂ had been static or even declining in recent years with little prospect for further growth in the future.²⁴ GrowHow attributed this to falling demand for liquid CO₂ from the nuclear industry and efficiency improvements in the manufacture of carbonated drinks. Azelis told us that demand for liquid CO₂ in the food and beverage sector had also declined as a result of the demand shift from carbonated drinks to still drinks and mineral water.
- 3.23 On the basis of these views that there has been little, if any, growth in this market, we estimate that current sales of liquid CO₂ are around 400,000 tonnes a year.
- 3.24 Since our 2007 report there has been both exit and entry of CO₂ liquefaction facilities:
- (a) In 2009, Air Products closed its [REDACTED]-tonne-capacity hydrogen production plant and associated CO₂ liquefaction facility in Wilton, Teesside.
 - (b) In 2010, Yara opened a 250,000-tonne-capacity liquefaction facility at the site of a bioethanol plant in Wilton, Teesside, which is owned by a third party (Ensus).²⁵
 - (c) In October 2010 (shortly before we published our provisional decision), Air Liquide informed us that it was constructing a 70,000-tonne-capacity liquefaction

²²Azelis told us that the current price was £[REDACTED].

²³See our 2007 report, paragraphs 5.4, 15.77, 15.85 & 15.91. The relevant text was redacted from the published version of our 2007 report due to commercial sensitivities at the time regarding the closure of Severnside.

²⁴GrowHow told us that it was not able to provide an updated figure as it was no longer active in the supply of liquid CO₂.

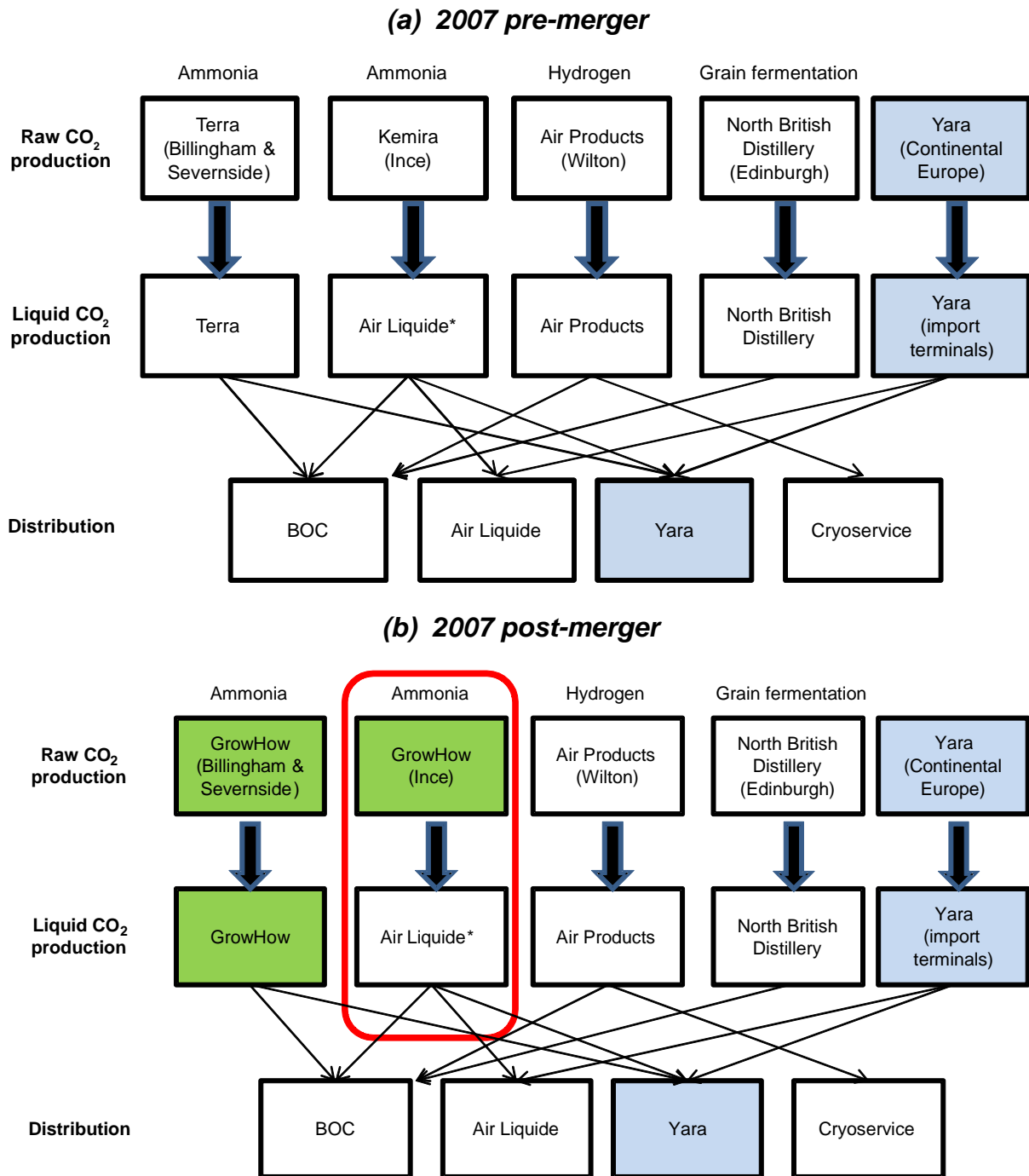
²⁵This is not the same Wilton plant as the Air Products Wilton plant.

facility at the British Sugar bioethanol plant in Wissington, Norfolk.²⁶ The plant is expected to become operational later in 2011.

3.25 Figure 1 shows the liquid CO₂ supply chain prior to the merger, following the merger in 2007 and once the Wissington plant becomes operational later in 2011.

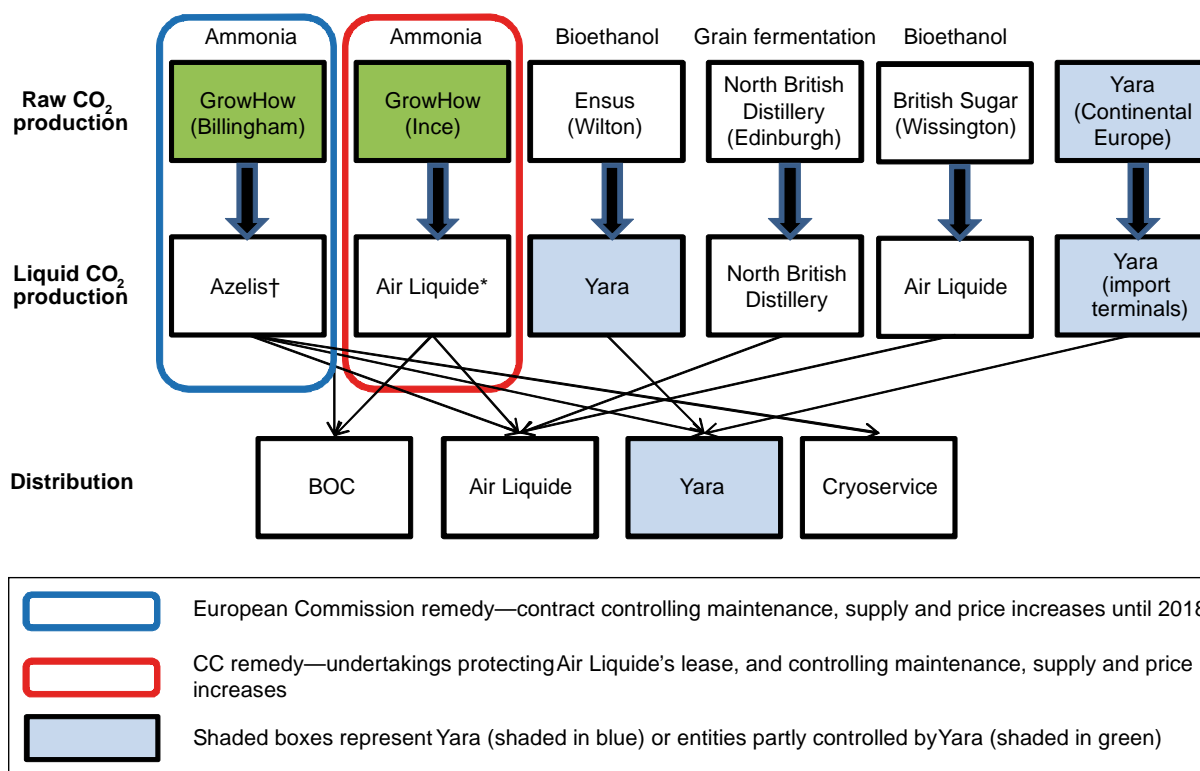
FIGURE 1

Liquid CO₂ supply chain in 2007 both pre-merger and post-merger and later in 2011



²⁶This capacity figure represents the annual capacity of the plant once it becomes operational. Air Liquide told us that the nameplate capacity of the plant will be 70,000 tonnes but the amount of raw CO₂ available will be sufficient to produce [] tonnes of liquid CO₂ per year.

(c) 2011 (once Wisington plant becomes operational)



Source: CC analysis.

*Plant at Ince owned by Air Liquide and operated by GrowHow (pre-merger, operated by Kemira).

†Plant at Billingham owned by Azelis and operated by GrowHow.

Note: Arrows showing supply agreements between producers and distributors are for illustrative purposes only.

3.26 Figure 1 shows that there are complex vertical relationships between raw CO₂ producers, liquefiers of that raw CO₂ and distributors of liquid CO₂. We recognize that the theories of harm in our 2007 report took into account these vertical arrangements. We have therefore been careful not to draw bright lines between raw CO₂ production and liquid CO₂ production. This is consistent with our 2007 report which considered the market for supply of CO₂ to distributors within the UK (and which included the supply by Kemira of raw CO₂ to Air Liquide at Ince).²⁷

3.27 Figure 1 highlights the changes in raw CO₂ producers and liquid CO₂ producers as a result of the JV and as a result of developments since our 2007 report:

- (a) Pre-merger there were four providers of UK-based sources of raw CO₂ (Terra at Billingham and Severnside, Kemira at Ince, Air Products at Wilton and North British Distillery (NBD) at Edinburgh). The merger reduced this to three providers (GrowHow at Billingham, Severnside and Ince, Air Products and NBD).
- (b) By later in 2011 there will be four providers of UK-based sources of raw CO₂: Grow How at Ince and Billingham, Ensus's bioethanol plant at Wilton, British Sugar's bioethanol plant at Wisington and NBD. These plants are contractually bound to deliver raw CO₂ for liquefaction to the parties that own or rent the liquefaction facilities at these plants (eg Azelis at Billingham, Air Liquide at Ince and Wisington, and Yara at Wilton).

²⁷Our 2007 report, paragraph 10.35.

(c) Since our 2007 report the number of providers of liquid CO₂ to distributors has decreased from five providers (GrowHow, Air Liquide, Air Products, NBD and Yara imports) to four providers (Azelis, Air Liquide, Yara and NBD).

3.28 Table 1 shows the existing annual capacity of each CO₂ liquefaction plant.

TABLE 1 Capacity of liquid CO production in the UK, 2011

Plant	Owner	Source of raw CO ₂	Annual capacity '000 tonnes
Wilton	Yara	Bioethanol production	
			250
Billingham*	Azelis	Ammonia production	
			250
Ince	Air Liquide	Ammonia production	
			[REDACTED]
Edinburgh	NBD	Grain fermentation	[REDACTED]
Wissington†	Air Liquide	Bioethanol production	[REDACTED]
Total			[REDACTED]
Imports	Yara		[REDACTED]
Total			[REDACTED]

Source: CC analysis.

*Azelis told us that the theoretical capacity was 315,000 tonnes but that the realistic maximum capacity was only 250,000 tonnes per year.

†The Wissington figure represents the annual capacity of the plant once it becomes operational later in 2011. Air Liquide told us that the nameplate capacity of the plant would be 70,000 tonnes but the amount of raw CO₂ available would be sufficient to produce [REDACTED] tonnes of liquid CO₂ per year.

3.29 Table 1 shows that total UK liquefaction capacity (excluding Yara's import facilities) currently stands at around [REDACTED] tonnes a year and that this capacity will rise to over [REDACTED] tonnes a year when the Air Liquide facility at Wissington becomes operational later in 2011.²⁸ Whereas in 2007 the main source of raw CO₂ in the UK was from ammonia production,²⁹ it now only accounts for just over 50 per cent, with the other 50 per cent being primarily bioethanol production.

3.30 Comparing liquid CO₂ sales in paragraph 3.23 with UK capacity from later in 2011 in paragraph 3.29 suggests that there is spare capacity in the market of [REDACTED] tonnes (around 40 per cent of total UK capacity). However, this figure is overstated due to a number of important characteristics of CO₂ production and demand:

(a) Suppliers of CO₂ tend to have only limited storage capacity.³⁰

(b) Demand for CO₂ is subject to seasonal fluctuations, in principle because demand from the food and beverage sectors varies seasonally, with highest demand in summer and autumn.³¹

(c) Interruptions to supply of CO₂ are common, primarily because of interruptions in ammonia production. Yara explained that ammonia production depended criti-

²⁸It also shows our estimate of imports as [REDACTED] tonnes, which was the highest recorded import figure in the period 2008–2010, including Yara's self-supply and imports supplied to third parties.

²⁹Our 2007 report, paragraph 10.19.

³⁰See our 2007 report, paragraph 10.7. We were told that at one plant storage of around 1 per cent of capacity (which amounted to c. 10 days' usage) was held to deal with short planned and unplanned outages.

³¹See our 2007 report, paragraph 10.10. GrowHow disagreed with this point and said that demand from many customers, such as nuclear power plants, was not seasonal at all; and that customers who are subject to a degree of seasonality, order CO₂ in advance to deal with their seasonal peaks in downstream application markets. We note this may be the case for some customers but we also found that security of supply is seen as crucial which suggests that suppliers do need to be able to meet seasonal peaks.

cally on the price of natural gas. Depending on the relative price of natural gas compared with ammonia, it may become economical to shut down an ammonia plant and import ammonia. Since raw CO₂ is a by-product of ammonia, if the ammonia plant is closed, there will be no raw CO₂ produced.³² Yara said that this had happened several times over the past five years with the most significant UK plant shut down in 2009.³³ Yara said that [REDACTED].

(d) Reliability of supply is considered important by final customers of liquid CO₂ which means that distributors need to have supply agreements for liquefied CO₂ from several sources. For example, BOC said that, in the case of supply disruption, [REDACTED] Air Liquide said that, following the closure of the Air Products plant in 2009 and ammonia plant outages, it preferred to incur losses and purchase expensive imports than [REDACTED].

3.31 These factors tend to lead to a requirement for spare capacity. We consider issues of spare capacity in each liquefaction plant further in our assessment in Section 5.

4. The OFT's advice to the CC and jurisdictional issues

4.1 In this section we set out:

(a) GrowHow's request for review of the Undertakings;

(b) Air Liquide's views on GrowHow's request;

(c) the OFT's advice to the CC; and

(d) jurisdictional issues regarding the relationship between the Undertakings and the European Commission's remedy in the Yara/Kemira merger.

GrowHow's request for review of the Undertakings

4.2 On 10 July 2009, GrowHow submitted a finalized request to the OFT for a release from paragraphs 7 to 11 of the Undertakings.³⁴ This effectively represented a complete release from the Undertakings in so far as they relate to CO₂.

4.3 GrowHow submitted that the change of circumstances was the closure of the Severnside facility and the sale of the Billingham facility to Azelis such that the CO₂ liquefaction operations formerly owned by Terra and transferred to GrowHow as part of the merger were respectively terminated and ceased to be under the control of GrowHow. GrowHow said that it had consequently exited from the market for the supply of liquid CO₂ in the UK.

4.4 GrowHow submitted that as a result of this change of circumstances the SLC identified in our 2007 report had been removed and that the parties should be released from paragraphs 7 to 10 of the Undertakings. It also said that paragraph 11 of the

³²In the event of a shutdown, the same would apply to other processes by which raw CO₂ is produced. However, alternative sources of raw CO₂ are less prone to supply interruptions than ammonia production.

³³By way of example, our 2007 report showed how production of ammonia in the UK was suspended at Ince in the winter of 2005/06 (see our 2007 report, paragraph 10.34, and Appendix F); in 2009, the facility at Ince was shut for a period; and Azelis also told us of three shutdowns due to gas prices at the Billingham plant—December 2005 to March 2006, January 2007 to February 2007 and December 2008 to February 2009.

³⁴GrowHow originally submitted its request for review to the OFT on 18 September 2008, but this request was altered several times before GrowHow submitted a finalized request on 10 July 2009. (See the OFT's advice, paragraphs 3–5 & 42.)

Undertakings had expired, and that the parties should be released from this requirement as a matter of good administration.

- 4.5 GrowHow also submitted that the cost of complying with the Undertakings, in particular paragraph 7 regarding the Confidentiality Guidelines, was placing an unnecessary burden on its business. It added that as a result of paragraphs 8 to 10 of the Undertakings in relation to the Ince Agreement, [REDACTED].
- 4.6 GrowHow's specific arguments in relation to each of paragraphs 7, 8 to 10 and 11 are set out in further detail in the relevant parts of Section 5.

Air Liquide's views on GrowHow's request

- 4.7 Air Liquide said that the SLC identified in our 2007 report had not changed in any way because GrowHow was still present in the market for the supply of liquid CO₂ as (i) GrowHow continued to operate the liquefaction plants at Ince and Billingham,³⁵ and (ii) when viewed as part of the wider Yara corporate group, Yara was present in the supply of liquid CO₂ to distributors through its call option on part of Azelis's Billingham capacity and its import of CO₂ into the UK. It also argued that as the market definition in our 2007 report included the supply of raw CO₂ to Air Liquide at Ince, it would also include the supply of raw CO₂ to Azelis at Billingham.

The OFT's advice to the CC

- 4.8 In its advice, which was published at the same time as our provisional decision, the OFT identified the following change of circumstances: (i) the closure of the Severnside plant; (ii) the sale to Azelis of the CO₂ liquefaction plant at Billingham; and (iii) the acquisition of Kemira by Yara.
- 4.9 The OFT concluded that the closure of Severnside and divestment of Billingham had not removed the basis for the SLC arising in respect of raw CO₂.
- 4.10 The OFT also considered the effect of the acquisition of Kemira by Yara and whether GrowHow remained active in the supply of liquid CO₂. It found that it could not dismiss the possibility that GrowHow's future behaviour could be changed given the fact that Yara was active in the supply of liquid CO₂,³⁶ and that this could give rise to 'fundamentally the same SLC identified by the CC in its report ... albeit that it involves a different entity [Yara]'. The OFT said that its conclusion in paragraph 4.9 held irrespective of the acquisition of Kemira by Yara.
- 4.11 The OFT recommended that:
- (a) as a result of the change of circumstances, the parties should be released from paragraph 7 of the undertakings;
 - (b) notwithstanding the change of circumstances, the obligations in paragraphs 8 to 10 of the Undertakings should remain in force; and
 - (c) paragraph 11 of the Undertakings was no longer in force; for the avoidance of doubt and good administrative practice, the CC should confirm this by releasing the parties from it.

³⁵OFT advice, paragraph 108.

³⁶OFT advice, paragraph 146.

- 4.12 The OFT's specific advice in relation to each of paragraphs 7, 8 to 10 and 11 are set out in further detail in the relevant parts of Section 5.

Jurisdictional issues regarding the status of Yara's acquisition of Kemira

GrowHow's and Air Liquide's views

- 4.13 GrowHow UK submitted that in our 2007 report the SLC in relation to CO₂ derived solely from the competitive overlap between CO₂ production at Billingham and Ince, and the changed incentive that the removal of the competitive overlap would give the JV in relation to the Ince Agreement. It also submitted that the Undertakings in so far as they related to CO₂ were designed solely to deal with this SLC, and that the CC left out of its analysis the identification (and remedy) of any possible SLC arising from Yara's acquisition of Kemira, since the transaction was subject to the exclusive jurisdiction of the European Commission and UK competition law could not be applied to any aspect of the transaction.
- 4.14 GrowHow said that any notion that the SLCs resulting from the Kemira/Terra merger and the Yara/Kemira merger might be similar must be rejected since the SLCs resulted from quite different mergers and involved different parties, control structures and market dynamics. It said that a specific SLC could not be retained or modified or used to remedy a different SLC arising from a different merger situation which was assessed by the European Commission, and that the European Commission must have been fully capable of assessing the actual and potential impact of the Yara/Kemira merger on the UK CO₂ market.
- 4.15 Air Liquide accepted that the review of the Undertakings should not seek to remedy the effects of the Yara acquisition of Kemira. However, it argued that the OFT and the CC should have regard to the change of circumstances involving Yara even though, in its view, the review and any decision not to release or vary the undertakings need not depend on these circumstances. Air Liquide characterized the Yara acquisition of Kemira as being an additional factor that highlighted the persistence of the SLC identified by the CC.

Our assessment

- 4.16 GrowHow applied to be released from the Undertakings because of a change of circumstances as set out in paragraph 4.8 above. It follows that the CC has to have regard to what that change of circumstances is, and to decide whether the outcomes, which the Undertakings are intended to remedy, would still exist.
- 4.17 These changes in factual circumstances have arisen in part because of a merger (Yara/Kemira) which needed notification to and clearance from the European Commission and a remedy (divestment by GrowHow of the Billingham plant) as a result of that merger.
- 4.18 However, there is a difference between the CC considering whether, by reason of a change of circumstances (including changes arising from an EU merger), an undertaking given to remedy an SLC is no longer appropriate, and the CC purporting to vary an undertaking, given to remedy an SLC, in order to remedy perceived anti-competitive outcomes of an EU merger. Clearly, we cannot do the latter.
- 4.19 Thus, although GrowHow argued strongly that the CC had no jurisdiction to consider 'concerns ... in relation to GrowHow's new/changed incentives towards Air Liquide at Ince ... [which] derive solely and directly from Yara's acquisition of Kemira', we

consider that this claim is overstated. We need to look at the factual and economic situation as it is now in so far as this has a bearing on the SLC that was identified and the remedies accepted by the CC: this includes Yara's acquisition of Kemira and the consequential divestment of the liquefaction facility at Billingham by GrowHow. We recognize that we cannot consider any competition issues arising solely from Yara's acquisition of Kemira as this was cleared, subject to undertakings, by the European Commission.

- 4.20 We are satisfied that we are able to consider the effects of the change of circumstances in this review,³⁷ and that this does not (as claimed by GrowHow):

in practice mean that the CC was not assessing the effects of the merger that created the joint venture GrowHow and which lies within its jurisdiction but a different merger (and its competitive effects) (Yara/Kemira) which lies outside of the CC's jurisdiction and within the EC Commission's exclusive jurisdiction.

- 4.21 We consider that the two transactions—the Kemira/Terra JV and the Yara/Kemira merger—and the decisions in each of these transactions were considered in sequence, notwithstanding the overlap of parties and the markets under consideration. We believe that, in principle, in considering whether remedies for a merger situation should be retained, we should properly have regard to the effects in the relevant market of a subsequent merger—even if that merger was considered in another jurisdiction and remedies were put in place in the expectation of addressing competition concerns raised by the merger. Thus the fact that Yara acquired Kemira appears to introduce an element which is potentially relevant to our consideration of whether it is appropriate to retain undertakings given to remedy the original SLC.

Our view on jurisdictional issues

- 4.22 In our view, we can properly have regard to the economic consequences arising from Yara's changed role as regards GrowHow when reviewing whether the Undertakings should be varied or released, so long as the focus of the review continues to be on GrowHow and the SLC identified in our 2007 report.

5. Our assessment of whether the change of circumstances make it appropriate to vary the Undertakings

- 5.1 In this section, we set out our assessment of whether, as a result of any change of circumstances (see paragraph 4.8), the Undertakings are no longer appropriate and either GrowHow can be released from them or they should be varied or superseded.
- 5.2 In relation to the first of the change of circumstances in paragraph 4.8, we note that the closure of the Severnside plant had been contemplated in the merger plans between Kemira and Terra, and the effects of the closure on competition were considered in our 2007 report.³⁸ We also note that the closure has the effect of reducing the number of sources of raw CO₂, and so is not likely to support a variation or release of the Undertakings as requested by GrowHow. We therefore do not find that it is appropriate to vary or release the Undertakings on the basis of the closure of the Severnside plant.

³⁷See, for example, *Inntrepreneur Pub Company (CPC) v Crehan* [2007] 1AC333.

³⁸See our 2007 report, paragraphs 5.4, 15.77, 15.85 & 15.91. The relevant text was redacted from the published version of our 2007 report due to commercial sensitivities at the time regarding the closure of Severnside.

5.3 Our assessment of the effect of the change of circumstances caused by the acquisition of Kemira by Yara and the resulting sale to Azelis of the CO₂ liquefaction plant at Billingham³⁹ is structured as follows:

(a) We consider the effect of this change of circumstances on the SLC identified in our 2007 report. This includes an assessment of the three theories of harm that comprised the SLC (paragraphs 5.4 to 5.81).

(b) We consider the effect of this change of circumstances on each of:

(i) paragraphs 8 to 10 of the Undertakings, relating to the Ince Agreement (paragraphs 5.83 to 5.93);

(ii) paragraph 7 of the Undertakings, relating to the Confidentiality Guidelines (paragraphs 5.94 to 5.105); and

(iii) paragraph 11 of the Undertakings, relating to renegotiation of the Ince Agreement (paragraphs 5.106 to 5.109).

Our assessment of the effect of the change of circumstances on the SLC

5.4 The SLC in our 2007 report was based around a unilateral effects theory of harm. Our 2007 report said that:

The parties are by far the largest producers of raw CO₂ 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 CO₂ at Billingham and Severnside. At Ince the JV could use the threat of termination of the contract to raise the price of raw CO₂ or to curtail output in order to maximise 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 the parties may also have the potential to result in an increase in ex-works prices at other sites.⁴⁰

5.5 The SLC was, therefore, based on three theories of harm:

(a) the opportunity for GrowHow to raise its ex-works prices for liquid CO₂ at Billingham and Severnside;

(b) the curtailing of supply of raw CO₂ at Ince in order to maximize sales of liquid CO₂ from GrowHow's other UK plants; and

(c) the threat of termination of the contract with Air Liquide at Ince (ie the Ince Agreement) to raise the price of raw CO₂.

5.6 We consider in turn whether each of these theories of harm still holds given the change of circumstances identified by the OFT.

³⁹These are the second and third of the change of circumstances identified by the OFT (see paragraph 4.8).

⁴⁰Our 2007 report, paragraph 10.65.

Theory of harm (a): raising ex-works prices for liquid CO₂ at Billingham and Severnside

- 5.7 Theory of harm (a) concerns the opportunity for GrowHow to raise its ex-works prices for liquid CO₂ at Billingham and Severnside. Our 2007 report identified this theory of harm because the available capacity at Ince was seen as an important factor in constraining the ex-works prices of CO₂ at Billingham and Severnside.⁴¹
- 5.8 As set out in paragraph 3.20, the Severnside plant has now closed and so theory of harm (a) can no longer apply to raising ex-works prices for liquid CO₂ at Severnside.
- 5.9 We also found that GrowHow is no longer able to raise the ex-works price for liquid CO₂ at Billingham because it has divested the Billingham liquefaction facility to Azelis. Even though GrowHow provides the raw CO₂ at Billingham and operates the liquefaction plants at Billingham on behalf of Azelis, it does not sell that liquid CO₂ to distributors.
- 5.10 We note that the OFT considered a variant of this theory of harm according to which GrowHow may increase the price of raw CO₂ to Azelis at Billingham which, in turn, may result in higher prices to distributors of liquid CO₂ downstream.⁴²
- 5.11 GrowHow said that the terms of the Billingham Agreement (see paragraph 3.16), which was signed in 2008 for an initial term of [X] years, [X], oblige it to make raw CO₂ available to Azelis, and control increases in the price of raw CO₂. This information was confirmed by Azelis.
- 5.12 We conclude that as long as the Billingham Agreement is in place there is no ability for GrowHow to raise ex-works prices for liquid CO₂ at the Billingham plant.

Theory of harm (b): curtailing of supply of raw CO₂ at Ince to maximize liquid CO₂ sales at other plants

- 5.13 Theory of harm (b) concerns the curtailing of supply of raw CO₂ at Ince to maximize liquid CO₂ sales at other plants. Our 2007 report set out the concern that the incentives on the JV would be different from those which faced Kemira as a separate entity. It noted that pre-merger, Kemira had no incentive to restrict output at Ince because sales of raw CO₂ were an important contribution to the fixed costs of operating the Ince facility; post-merger it said that the JV would seek to maximize the profitability of its CO₂ 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.⁴³
- 5.14 For the reasons set out in paragraphs 5.8 and 5.9, we found that GrowHow no longer has other plants at which to maximize sales of liquid CO₂. Therefore this theory of harm could only be manifested through GrowHow's control of output and price of raw CO₂. One of the conditions necessary for this manifestation of the theory of harm to hold would be that the contribution margin for raw CO₂ at Billingham would have to be greater than the margin at Ince. GrowHow provided us with information that showed that given the price of raw CO₂ in the Billingham Agreement the contribution margin at [X] is [X] than at [X]. Based on paragraphs 5.42 to 5.47, we also found that there was little spare capacity at [X].

⁴¹Our 2007 report, paragraph 10.45.

⁴²OFT advice, paragraph 116.

⁴³Our 2007 report, paragraph 10.47.

- 5.15 As a result, we conclude that as long as the Billingham Agreement is in place GrowHow does not have an incentive to curtail supply of raw CO₂ at Ince in order to maximize sales of liquid CO₂ at other plants (ie Billingham).

Theory of harm (c): threat of termination of the Ince Agreement to raise the price of raw CO₂

- 5.16 Theory of harm (c) concerns the threat of termination of the Ince Agreement to raise the price of raw CO₂. Our 2007 report set out that Kemira could seek to increase its prices at Ince for raw CO₂ by [§].⁴⁴ It also set out that, over a longer timescale, the Ince Agreement could be terminated unilaterally by Kemira [§].⁴⁵ This concern arose because post-merger Terra's facilities at Severnside and Billingham were no longer independent alternative sources of supply to Ince.⁴⁶
- 5.17 Air Liquide submitted that if GrowHow were released from the Undertakings it would have every incentive to threaten to terminate the Ince Agreement if Air Liquide did not agree to an increase in the price for raw CO₂ that GrowHow had accepted as a condition for approval of the JV.
- 5.18 If Air Liquide were to nullify such a threat from GrowHow, it would need to have both the incentive and the ability to switch sufficient of its raw CO₂ requirements from Ince. As raw CO₂ is used to produce liquid CO₂, Air Liquide could, if it were able, also constrain the price rise by switching to alternative sources of liquid CO₂. In principle, Air Liquide could therefore potentially constrain a price rise at Ince by:
- (a) buying liquid CO₂ from alternative existing sources, provided there are sufficient sources at a price that can constrain the price of raw CO₂ at Ince; or
 - (b) building a new liquefaction plant at an alternative source of raw CO₂ or buying liquid CO₂ from alternative new sources, in both cases provided there are sufficient new sources of CO₂ that can be accessed on a timely basis and at a price that can constrain the price of raw CO₂ at Ince.
- 5.19 To assess theory of harm (c), we therefore consider:
- (a) Air Liquide's requirements for liquid CO₂;
 - (b) how much Air Liquide would need to switch away from Ince to defeat any price rise;
 - (c) the availability of sufficient alternative existing sources of liquid CO₂ at a price that can constrain GrowHow; and
 - (d) possible future entry or expansion.

⁴⁴Our 2007 report, paragraph 10.48. The CC also said that it did not believe that Air Liquide's negotiating position would have allowed it to secure a new agreement over the price of raw CO₂ (see paragraph 15.80).

⁴⁵Our 2007 report, paragraph 10.42.

⁴⁶GrowHow said that this was a new theory of harm and SLC based on GrowHow possessing unilateral market power in the supply of raw CO₂. It said that this SLC was not to be found in our 2007 report, as demonstrated by paragraph 10.47 of our 2007 report. We did not accept that this was a new theory of harm. In our view paragraph 10.47 was not determinative as to the precise SLC in our 2007 report. We considered the unilateral effects as set out in paragraph 10.65 of our 2007 report – in our view this paragraph, in conjunction with paragraphs 10.42 and 10.48, clearly set out the theory of harm described in theory of harm (c).

Air Liquide's requirements for liquid CO₂

- 5.20 GrowHow said that it believed Air Liquide's requirements for liquid CO₂ would be expected to fall substantially owing to Yara's 'very large scale entry as a UK manufacturer'.
- 5.21 Figure 2 shows Air Liquide's actual and forecast annual purchases and annual sales to distributors of liquid CO₂ from 2008 to 2012.

FIGURE 2

Air Liquide's actual and forecast annual purchases and sales to distributors of liquid CO₂, 2008 to 2012

[REDACTED]

Source: CC analysis of Air Liquide data.

- 5.22 Figure 2 shows that Air Liquide's purchases of liquid CO₂ [REDACTED]. On average, Air Liquide purchases around [REDACTED]. Air Liquide expects to purchase around [REDACTED] tonnes of liquid CO₂ in 2011 and 2012. In 2010, Air Liquide sourced its liquid CO₂ from three UK plants—Ince, Billingham and Edinburgh—plus a small amount of imports. In 2010, Air Liquide purchased around [REDACTED] tonnes of raw CO₂ from Ince. In 2011, Air Liquide told us that it also expected to source liquid CO₂ from Wisington [REDACTED].
- 5.23 We considered GrowHow's point in paragraph 5.20 that Air Liquide would be expected to lose market share to Yara's new Wilton plant. Although Air Liquide could lose market share as a possible outcome of future competition from Yara, competition is a dynamic process which is often characterized by uncertainty. We note that decisions to contract with particular suppliers will be affected by a range of factors including production costs, transportation costs, the price the supplier is willing to offer and any long-term contractual arrangements for raw CO₂. It is therefore difficult to say whether any particular plant would lose market share. We therefore find on the basis of the available evidence that it is difficult to form an expectation that Air Liquide will require materially less CO₂ than it currently forecasts.
- 5.24 Based on paragraphs 5.22 and 5.23, we found that Air Liquide might require access to alternative volumes of liquid CO₂ that were greater than its current sales forecast. This is because of the lack of storage capacity, seasonal fluctuations in demand, the risk of supply interruption and the need for reliability of supply (see paragraph 3.30).

How much Air Liquide would need to switch away from Ince to defeat any price rise

- 5.25 In its response to our provisional decision, GrowHow said that Air Liquide would not need to switch 100 per cent of its requirements from Ince in order to discipline GrowHow from increasing prices unjustifiably.
- 5.26 In assessing theory of harm (c), we therefore considered the possibility of Air Liquide switching either part of its raw CO₂ volumes from Ince or all of its raw CO₂ volumes from Ince.

- 5.27 Based on information from GrowHow and Air Liquide, we calculated that an increase in raw CO₂ prices at Ince from £[redacted] to £[redacted]⁴⁷ would be unprofitable for GrowHow if Air Liquide switched away [redacted] tonnes of its [redacted] tonnes raw CO₂ consumption from Ince (see Appendix A, Table 1).⁴⁸ This conclusion can be reached by both GrowHow and Air Liquide on the basis of the information available to both of them. Moreover, both GrowHow and Air Liquide can carry out a sensitivity analysis to establish that the higher the price rise by GrowHow, the higher the volume that Air Liquide needs to switch to make a price rise of raw CO₂ at Ince unprofitable for GrowHow.⁴⁹
- 5.28 There appeared to be three ways in principle that Air Liquide could switch some or all of its CO₂ requirements away from Ince:
- (a) Air Liquide could potentially switch some volumes from Ince within the existing take-or-pay obligations of the Ince Agreement;
 - (b) Air Liquide could potentially switch some volumes from Ince and negotiate a new contract at Ince (for example, with no take-or-pay obligations); or
 - (c) Air Liquide could potentially close the liquefaction plant at Ince and switch all its requirements away from Ince.
- 5.29 In assessing the viability of these three alternatives, there are a number of factors that Air Liquide would need to take into account:
- (a) *Any take-or-pay obligation under the Ince Agreement.* Air Liquide told us that under the Ince Agreement it could not switch more than a limited amount of CO₂ from Ince as it was under a take-or-pay obligation which covered [redacted] tonnes. In the event that the Ince Agreement were to continue, Air Liquide is therefore constrained from switching more than [redacted] tonnes away from Ince (based on volumes of [redacted] tonnes purchased from Ince in 2010). As this is less than the [redacted] tonnes in paragraph 5.27, we found that Air Liquide is unlikely to be able to prevent GrowHow from increasing prices of raw CO₂ at Ince within the existing take-or-pay obligations of the Ince Agreement (ie scenario (a) in paragraph 5.28). We noted that this obstacle to switching some volumes from Ince could be overcome if, following a termination of the Ince Agreement, Air Liquide negotiated a new contract for a lower quantity (with or without a take-or-pay obligation) (ie scenario (b) in paragraph 5.28). We noted that the precise outcome of such a commercial negotiation would be uncertain. In our view, if Air Liquide were unable to prevent termination of the Ince Agreement, it would be unlikely to be in a strong negotiating position. Any terms are therefore likely to be less favourable to Air Liquide than under the Ince Agreement (for example, higher prices, greater take-or-pay obligations).

⁴⁷We note that under the contract between GrowHow and Air Liquide concluded as a result of the Undertakings, GrowHow charged approximately £[redacted] per tonne of raw CO₂ until 14 January 2010 and approximately £[redacted] per tonne of raw CO₂ thereafter.

⁴⁸This figure is derived from a sensitivity analysis of what effect there is on profit of different volumes of raw CO₂ being switched away from Ince given a price rise from £[redacted] to £[redacted]. This calculation used an increase in price of raw CO₂ and the changing profit derived from selling different quantities of raw CO₂ to Air Liquide at the higher price. The analysis assumed that the revenue from raw CO₂ is in effect a margin for GrowHow. This is because all costs associated with the liquefaction of raw CO₂ are paid separately and raw CO₂ is a by-product of the ammonia plant.

⁴⁹GrowHow submitted that, as a small increase in price (eg from £[redacted] to £[redacted]) would be unprofitable if Air Liquide switched only a limited amount of capacity away from Ince (in this case [redacted] tonnes of raw CO₂), we had overestimated the alternative capacity that Air Liquide needs to be able to threaten GrowHow credibly with switching. However, our analysis showed that while small price rises would become unprofitable with only small amounts of capacity switched away from Ince (and thus are unlikely to be contemplated by GrowHow), larger price rises required larger amounts of capacity switched away to make them unprofitable. This means that, while GrowHow may not find it profitable to increase the price of raw CO₂ by a little, it may find it profitable to increase the prices by a lot, as such a price rise will require Air Liquide to find larger alternative capacity to switch to, which is likely to be more difficult than if Air Liquide needed to find only a small amount of alternative capacity. We note that this is only a part of our analysis and is not on its own sufficient to evaluate Air Liquide's incentives to switch.

- (b) *The fixed costs that Air Liquide pays GrowHow at Ince as long as it produces any amount of liquid CO₂ at Ince.* Under the Ince Agreement, Air Liquide currently pays £[redacted] fixed costs (escalating over time) to GrowHow. These costs would be incurred in any situation where Air Liquide switched only a part of its requirements at Ince to an alternative source of CO₂. We assumed that these fixed costs would remain the same under renegotiation of the Ince Agreement in the absence of the Undertakings.⁵⁰ This means that any alternative source of CO₂ would have to be sufficiently cheap to compensate for fixed costs that Air Liquide would continue paying at Ince. These fixed costs could only be avoided if Air Liquide closed the Ince liquefaction plant (ie scenario (c) in paragraph 5.28). In doing so, Air Liquide would incur one-off costs of closing the plant and would lose a significant source of reliable supply.
- (c) *Any additional transportation costs that Air Liquide would incur if it switched to an alternative source of CO₂ because customers are situated further from the alternative source.* We did not have reliable evidence on the precise effect of transportation costs and how they would change if Air Liquide were to switch from one source of supply of liquid CO₂. We found that, as a general rule, the costs of distribution of CO₂ to customers are considerable.⁵¹ These switching costs would apply whether Air Liquide was switching some or all of its volumes. However, we noted that it is possible that some customers may be closer to the alternative source of supply than they were to the original one.
- (d) *The availability of spare liquid CO₂ from other sources at prices that will make it advantageous for Air Liquide to switch to.* We consider alternative sources in paragraphs 5.30 to 5.63.

Availability of sufficient alternative existing sources of liquid CO₂ at a price that can constrain GrowHow

- 5.30 To assess alternative existing sources of liquid CO₂, we examined the four UK liquefaction facilities that could provide alternative sources of liquid CO₂ to Ince—Wilton, Billingham, Edinburgh and Wisington (see Table 1). We consider each source in turn, before considering imports in paragraph 5.61.
- 5.31 We consider the incentives and ability for Air Liquide to switch some or all of its volumes at Ince to each alternative source taking into account: (i) the extent of spare capacity at each alternative source; and (ii) the costs of liquid CO₂ at each alternative source relative to Ince, including the need for Air Liquide to continue to cover the fixed costs at Ince (unless it is closing the plant and thus switching all volumes away from Ince) and the additional transportation costs to reach existing customers located nearer Ince than the alternative source.
- *Wilton*
- 5.32 The Yara-owned bioethanol liquefaction Wilton facility has an annual capacity of 250,000 tonnes per year. There is likely to be [redacted] spare capacity at Wilton ([redacted]) to cover [redacted] of Air Liquide's volumes from Ince. We therefore consider in paragraphs

⁵⁰This would appear to be a conservative assumption as the Undertakings give Air Liquide negotiating power that it may not have in their absence.

⁵¹Based on the data submitted by Air Liquide, Yara and BOC, the average transportation costs are between £[redacted] and £[redacted] per tonne.

5.33 to 5.41 whether Air Liquide would have the incentive to switch to Wilton if it were offered at a lower price⁵² than Air Liquide's current production costs at Ince.

5.33 In its response to our provisional decision, GrowHow drew our attention to [REDACTED].

5.34 [REDACTED]

5.35 Air Liquide told us that [REDACTED].⁵³

5.36 [REDACTED] does not, in our view, tell us much about Air Liquide's incentives to switch from Ince in the event of a price rise. Instead we need to examine (i) the relative costs and prices at Ince and Wilton (paragraphs 5.37 to 5.39) and (ii) the incentives of Yara to constrain GrowHow (paragraph 5.40).

5.37 We found that [REDACTED] than the £[REDACTED] cost at which Air Liquide could produce liquid CO₂ at Ince (including the cost of the raw CO₂ and fixed costs). This difference is despite Yara's production costs at Wilton (based on an output of [REDACTED] tonnes) being currently £[REDACTED]. This figure is around [REDACTED] per cent [REDACTED] than the £[REDACTED] costs of supplying liquid CO₂ at Ince.

5.38 We found that, if Yara were to charge Air Liquide [REDACTED]), Air Liquide would be unlikely to have an incentive to switch some of its volumes because it would still need to cover the fixed costs at Ince and any additional transportation costs to customers.

5.39 We next considered whether Air Liquide would have an incentive to switch all of its volumes to Wilton (ie closing Ince so as to avoid incurring fixed costs there). We found that, if Yara were prepared to charge Air Liquide a price that is lower than the cost of production at Ince and, assuming that there were no additional transportation costs that Air Liquide would incur as a result of switching and the costs of closing Ince were not significant,⁵⁴ Air Liquide would have an incentive to switch all of its volumes at Ince to Yara at Wilton.

5.40 We therefore considered whether Yara would have an incentive to undermine a price rise at GrowHow's Ince plant. We found that, because Yara now owns 50 per cent of GrowHow, the incentives of Yara and GrowHow, although not completely aligned, are not sufficiently different for Yara to be likely to generate a constraint on GrowHow:

(a) First, we found that, if Yara were to offer Air Liquide a price for liquid CO₂ at Wilton so as to attempt to undercut Air Liquide's production costs at Ince, the small margin that would be generated for Yara at Wilton would be unlikely to offset Yara's share of GrowHow's lost margin at Ince.⁵⁵ The small margin at Wilton would be further eroded if Yara's price offer also took into account any additional transportation costs that would be faced by Air Liquide.

(b) Second, in our view any company with control or joint control over another (in this case Yara) would want to ensure that profits are maximized across the group of companies, including any joint ventures (in this case GrowHow through its

⁵²This would include the supply price at Wilton plus any additional transportation costs that would arise as a result of switching to Wilton.

⁵³Yara told us that [REDACTED].

⁵⁴We recognized that these were conservative assumptions and would be likely to disincentivize Air Liquide from switching. Air Liquide would also want to take into account that it would become dependent on a competitor in the downstream market. This might also discourage switching to Yara.

⁵⁵Yara said that this did not represent an accurate description of how decision-making concerning any supplies to Air Liquide would necessarily be made in reality.

ownership of Kemira). We appreciate that Yara's incentives are not entirely aligned with GrowHow⁵⁶ but in our view decisions regarding plants are unlikely to be taken in isolation as Yara would consider the effect on profits across all plants in which it had an interest.

(c) Third, we noted that during the course of our review of the Undertakings, GrowHow had considerable knowledge regarding some of Yara's contractual arrangements (see, for example, paragraph 5.33; GrowHow also had knowledge of the end date of Yara's Billingham call option). This suggested that GrowHow is able to use the knowledge of Yara's wider commercial circumstances to inform its own business decisions.

5.41 Based on paragraphs 5.32 to 5.40, we find that Yara's capacity at Wilton is unlikely to be an attractive alternative source of supply for Air Liquide in the event of GrowHow threatening to terminate the Ince Agreement.

- *Billingham*

5.42 Azelis's Billingham ammonia-based liquefaction plant has a realistic maximum capacity of 250,000 tonnes per year. We consider the extent of spare capacity in paragraphs 5.43 to 5.47 and the relative costs of Ince and Billingham in paragraphs 5.48 to 5.51.

5.43 The extent of spare capacity at Billingham is complicated by the existence of the Billingham Agreement and Yara's Billingham call option (see paragraphs 3.16 to 3.18). Subject to certain contractual limitations (see paragraphs 3.17 and 3.18), Yara's Billingham call option gives it a call option for up to [REDACTED] tonnes at Billingham ([REDACTED]). This is [REDACTED] of the capacity at Billingham. With some exceptions, Yara has no obligation to take any of the volumes under its Billingham call option.

5.44 Yara and Azelis had different interpretations of Yara's Billingham call option. According to Yara, it is entitled to [REDACTED], approximately [REDACTED] per cent of Azelis's production capacity at Billingham ([REDACTED]). Azelis told us that in practice, as Yara had always stipulated 'committed volumes' of [REDACTED] tonnes per year in advance, only [REDACTED] tonnes was 'locked' to Yara in any given year (ie [REDACTED]), approximately [REDACTED] of Azelis's production capacity at Billingham.

5.45 Between 2008 and 2010, Yara took [REDACTED] tonnes of liquid CO₂ from Billingham. Yara told us that in 2011 and 2012 it expected to [REDACTED].⁵⁷ Azelis told us that, despite the opening of Wilton, Yara was nevertheless reserving its call option.

5.46 Azelis told us that Yara's Billingham call option effectively precluded it from substantially increasing its supply to either existing or potential customers. Azelis said that Yara's Billingham call option prevented it from making the volumes available to third parties under long-term agreements or even ad hoc use (for example, Azelis said that in the peak month of 2009 it was unable to meet demand for additional volumes from Air Liquide).

5.47 In our view, the uncertainty regarding the amount of available capacity at Billingham created by Yara's Billingham call option significantly restricts Azelis's ability to be a viable alternative source of supply for Air Liquide switching some or all of its volumes.

⁵⁶ GrowHow told us that [REDACTED].

⁵⁷ Yara said that it had not sought to apply any provision in its contracts with Azelis that restricted or prevented Azelis from supplying other customers. We noted that the Billingham call option continues to apply.

- 5.48 Despite these apparent capacity constraints at Billingham, we nevertheless compared the cost of production and price of liquid CO₂ at Billingham with the cost of production at Ince to consider Air Liquide's incentives for switching some or all of its volumes.
- 5.49 Azelis's production costs at Billingham are currently £[redacted] per tonne,⁵⁸ [redacted] than Air Liquide's production costs of £[redacted] per tonne at Ince. This would suggest that, if Azelis were able and prepared to sell liquid CO₂ to Air Liquide at [redacted] (ie in the absence of Yara's Billingham call option acting as a constraint on available capacity), there might be an incentive for Air Liquide to switch all of its volumes from Ince to Billingham. However, this does not take into account likely supply prices⁵⁹—we were told that Air Liquide and Azelis had signed a supply contract [redacted] for [redacted] tonnes a year of liquid CO₂ at £[redacted].⁶⁰ At [redacted], Air Liquide would not have an incentive to switch its liquid CO₂ from the current contractual arrangements at Ince to Billingham.⁶¹ For Air Liquide to consider switching all of its volumes at Ince to Billingham at this price, the supply price for raw CO₂ at Ince would need to increase from £[redacted] to £[redacted] (see Appendix A, Table 2).
- 5.50 The incentive for Air Liquide to switch some (rather than all) of its volumes from Ince are even weaker because it would need to take into account the fixed costs that would still be incurred at Ince.
- 5.51 We also considered what GrowHow could infer about Air Liquide's incentives to switch. In our view, GrowHow could use its knowledge of the cost of production at Billingham when Terra was running the liquefaction plant in 2007 (which was £[redacted] per tonne) and [redacted] to estimate that Air Liquide would not have an incentive to switch a part of its volumes away from Ince (see Appendix A, Table 3).
- 5.52 Based on the evidence in paragraphs 5.42 to 5.51, we found that Air Liquide would not be able to rely on securing surplus volume from Billingham as there is insufficient spare capacity due to Yara's Billingham call option and, even if such capacity were available, the price of liquid CO₂ at Billingham would be unlikely to incentivize Air Liquide to switch to Billingham.
- 5.53 Given that Yara's Billingham call option is a significant limitation on spare capacity at Billingham, we considered what would happen when the call option expires [redacted]. There are a wide range of possible outcomes that could occur following the expiry of Yara's Billingham call option. These range from continuation of the call option to an entirely different type of commercial arrangement. As a result, we have no evidence at this time that the capacity situation at Billingham in [redacted] will be any better than it is at present.
- *Edinburgh*
- 5.54 NBD's Edinburgh grain fermentation-based liquefaction plant has an annual capacity of [redacted] tonnes per year. In our 2007 report, NBD said that it did not vent significant

⁵⁸Azelis told us that these costs were expected to be between £[redacted] and £[redacted] per tonne for the next six months due to [redacted].

⁵⁹It also assumes there would be an insignificant effect from possible additional transportation costs. However, these additional transportation costs might change the incentives.

⁶⁰Azelis told us [redacted].

⁶¹[redacted] This is a different consideration from the one which persuaded Air Liquide to take on the supply arrangements with Azelis. The Azelis contract was taken on as a short-term replacement for lost capacity at Air Products' plant (see paragraph 5.59).

quantities of CO₂, and that its output at the time—around [REDACTED] tonnes a year—was all that could be produced at its site.⁶²

5.55 Air Liquide already purchases [REDACTED] tonnes of liquid CO₂ a year from NBD at a price of £[REDACTED] per tonne, [REDACTED] than the £[REDACTED] cost of production at Ince. Spare capacity is unlikely to be more than [REDACTED] tonnes per year.

5.56 Based on paragraphs 5.54 and 5.55, in our view the small amount of spare capacity at NBD's Edinburgh plant, which is [REDACTED] than liquid CO₂ at Ince, is unlikely to be a sufficient constraint on GrowHow.

- *Wissington*

5.57 Air Liquide told us that the Wissington bioethanol liquefaction plant was scheduled to become operational later in 2011. Air Liquide told us that the nameplate capacity of the plant will be 70,000 tonnes but the amount of raw CO₂ available will be sufficient to produce [REDACTED] tonnes of liquid CO₂ per year.

5.58 Air Liquide said that the effect of the new capacity at Wissington would be to replace the capacity lost by the closure of Air Products' liquefaction facility in 2009, from which Air Liquide was supplied with up to [REDACTED] tonnes of liquid CO₂ under a 'take-or-pay' arrangement. Air Liquide told us that it had previously considered that the investment in the plant at Wissington could not be justified, but after the closure of the Air Products facility and the outages at Billingham and Ince in 2009 (following previous outages in 2005/06) (see paragraph 3.30(c)) it decided that it needed an alternative source of supply to lessen its reliance on Yara and GrowHow.

5.59 Since the closure of the Air Products plant, Air Liquide had been purchasing liquid CO₂ from Azelis (see paragraph 5.49) and a limited amount of imports. This has been a short-term solution—Air Liquide told us that, once the Wissington facility became operational, [REDACTED]. To the extent that Air Liquide's requirements for liquid CO₂ [REDACTED] we have already considered the viability of Billingham as an alternative source of supply in paragraphs 5.42 to 5.53 above.

5.60 In our view, whilst Wissington does represent an alternative source of supply for a significant proportion of Air Liquide's liquid CO₂ requirements, it effectively just replaces current supplies from Billingham and imports, which themselves have been a short-term substitute for capacity that exited from the market in 2009 as a result of the closure of Air Products' liquefaction facility.

- *Imports*

5.61 Our 2007 report considered the extent to which the JV may be constrained by Yara which at the time imported liquid CO₂ using specialist ships and import facilities. The CC did not find that this source of CO₂ provided an effective competitive constraint.⁶³ We have not seen any evidence to change this view. Imports continue to be used as a more expensive alternative source of liquid CO₂ primarily during interruptions to supply (see paragraphs 3.30 and 5.59). For example, the imports of liquid CO₂ that Air Liquide took in 2008 to 2010 were charged at a 'spot' price and were in excess of £[REDACTED] per tonne. Similarly, BOC told us that [REDACTED].

⁶²See our 2007 report, paragraph 10.54.

⁶³Our 2007 report, paragraph 10.34.

5.62 In addition, since our 2007 report, Yara has gained joint control of GrowHow which, as discussed in paragraph 5.40, may limit its incentive to provide an effective constraint on GrowHow.

- *Conclusion on alternative existing sources of liquid CO₂*

5.63 We analysed all available sources of spare capacity of liquid CO₂ and their prices and found that the only source which Air Liquide could use with any degree of certainty was the NBD spare capacity, which is limited and [REDACTED]. The remainder of the spare capacity is either expensive (imports), [REDACTED] uncertain in terms of supply price and/or available quantity (Billingham and Wilton), and/or owned by a party which jointly controls GrowHow and is therefore unlikely to act as a constraint (Wilton and imports). We found that Air Liquide's production at Wissington was not an alternative source of CO₂ but rather a replacement of capacity withdrawn from the market following Air Products' closure.

5.64 We found that these conclusions held when considering switching of some or all of Air Liquide's Ince volumes.

5.65 Based on our findings in paragraphs 5.30 to 5.62, we conclude that we are not able to form an expectation that Air Liquide would have access to sufficient quantities of liquid CO₂ from existing alternative sources at a price that would enable it to prevent a price increase arising from the threat of termination of the Ince Agreement.

Possible future entry or expansion

5.66 Our 2007 report found that new liquefaction capacity at existing sites or bioethanol plants could not be excluded. However, the CC did not consider that new entry or expansion would be likely at or near to current prices for liquid CO₂. It therefore did not consider that the JV would be constrained by the potential for new entry or expansion.⁶⁴

5.67 Our 2007 report also considered the relative merits of liquefaction of raw CO₂ from bioethanol production versus liquefaction of raw CO₂ from ammonia production. Although liquefying raw CO₂ from bioethanol provides a more stable source of supply, our 2007 report noted that there were some uncertainties regarding the economic viability of bioethanol plants, both in the short term (in terms of securing funding) and in the long term (in terms of needing to guarantee 10 to 15 years of operation to justify investing in liquefaction). It also noted that the purity of CO₂ produced at bioethanol plants is lower than that from ammonia production.⁶⁵

5.68 Since our 2007 report, we noted that new bioethanol liquefaction facilities had been built at Wilton and Wissington. GrowHow said that the [REDACTED] notice period in the Ince agreement would allow Air Liquide to build a new plant if the Ince Agreement were terminated.

5.69 We considered whether future entry or expansion might provide an alternative source of liquid CO₂. We considered the likelihood of entry based on alternative sources of supply of raw CO₂ where liquefaction plants could be built, reasons for entry, and the cost and timescales for building new plants.

⁶⁴Our 2007 report, paragraph 10.63.

⁶⁵Our 2007 report, paragraph 10.62.

- *Possible alternative liquefaction sites*

5.70 [REDACTED] We understand that other potential sources of raw CO₂ are not likely to be ready for production within the next two years.

5.71 We understand that there are two bioethanol plants either being built or currently seeking funding in the UK—one by Vivergo Fuels at Saltend near Hull and one by Vireol at Grimsby. Air Liquide said that in general there was a considerable degree of uncertainty surrounding the building of the bioethanol plants and CO₂ liquefaction plants.

5.72 With regard to the Vivergo Fuels bioethanol plant under construction at Saltend:

(a) GrowHow said that Vivergo had an incentive to build a liquefaction plant in order to exploit the raw CO₂ that would be produced and otherwise vented into the atmosphere.

(b) Yara told us that the bioethanol plant could potentially provide 300,000–350,000 tonnes of CO₂ if a liquefaction facility were to be built there.

(c) Air Liquide said that building a liquefaction plant in Saltend was unlikely as the site had the highest classification under the Control of Major Accidents Hazards Regulations 1999, which would make the investment more complex and expensive (which was why Air Liquide itself had dismissed the possibility of building a liquefaction plant at Saltend).

(d) [REDACTED]

5.73 With regard to the Vireol bioethanol plant at Grimsby:

(a) Air Liquide said that Vireol, whilst mooted as a possible source of raw CO₂ by GrowHow at the time of our 2007 report, was yet to be fully financed and would take two more years after funding was obtained to become operational.

(b) [REDACTED]

- *Reasons for entry*

5.74 [REDACTED] cited reliability of supply as a key factor in deciding to build liquefaction facilities [REDACTED].

5.75 Azelis said that the development of the Wilton plant by Yara and the Wissington plant by Air Liquide was for strategic reasons as the two operators wanted to secure their presence in the upstream market. Azelis said that the likelihood of another investment in a CO₂ liquefaction facility of a similar size to Yara at Wilton (ie 250,000 tonnes a year) was unlikely. This was because such investment would be expensive and there was already overcapacity in the market.

5.76 We also noted that demand for liquid CO₂ is not growing significantly and is largely static.

- *Cost and timescales*

5.77 We were told by several parties that the development of any new liquefaction facility at a bioethanol site would be a lengthy and costly process:

- (a) Yara told us that it invested approximately £25 million to build the 250,000-tonne-capacity bioethanol-based liquefaction plant at Wilton.
- (b) Air Liquide told us that it will spend around £8.5 million to build the 70,000-tonne-capacity⁶⁶ bioethanol plant in Wissington. Air Liquide said that the Wissington bioethanol plant had been operational since 2007, yet Air Liquide's liquefaction plant would only come on stream later in 2011. It said that the site on which the liquefaction plant was being built had the lowest classification under the Control of Major Accidents Hazards Regulations 1999 and therefore—unlike other potential sites—was particularly suitable for a liquefaction plant.

(c) [REDACTED]

5.78 In contrast, GrowHow estimated that in its view a 47,000-tonne-capacity liquefaction plant could be built for £4 million. It also suggested that Air Liquide's liquefaction plant at Ince could be dismantled and relocated for between £0.5 million and £1 million. It said that it would be straightforward to attach a liquefaction plant to a new source of raw CO₂ gas. Air Liquide did not agree with GrowHow's comments. It said that recent experience of building liquefaction plants (see paragraph 5.77) showed that it was a costly exercise. It added that there was not a linear correlation between the costs of building a new plant and its capacity. Air Liquide also said that moving such a plant was not feasible due to (i) 'downtime' in moving the plant leading to a loss of continuity of supply for customers and likely loss of those customers and (ii) the uncertainty over the compatibility of the liquefaction plant with the alternative source of raw CO₂.

- *Conclusion on entry*

5.79 At the time of our 2007 report, the extent to which bioethanol might provide an alternative source of CO₂ was unclear. Since then, a large liquefaction facility has been built at one bioethanol plant (Wilton) and another facility is in construction at a second plant (Wissington).

5.80 Based on the evidence in paragraphs 5.66 to 5.77, we found that there are a limited number of potential sources of supply of raw CO₂ at which liquefaction plants could potentially be built. However, there are a number of factors which mean that we are unable to conclude that entry would provide a sufficient constraint to the threat of termination of the Ince Agreement:

(a) Although bioethanol may in certain circumstances be an additional source of CO₂ to ammonia, the viability of investing in bioethanol liquefaction plant is uncertain and must be set against any security of supply advantages. As there is little evidence of growing demand for liquid CO₂, reliability of supply is the main rationale for building a liquefaction plant.

(b) It is not clear that the alternative sources will allow entry in a timely manner—entry is likely to take at least two years from initial discussions to operation of a liquefaction plant. The same principle applies to any movement of Air Liquide's Ince liquefaction plant—an alternative source of raw CO₂ does not appear to be available for production of liquid CO₂ within two years.

(c) Although it is evident that [REDACTED], we cannot form an expectation that it is likely to enter in the foreseeable future.

⁶⁶See Table 1 for further details on the capacity of Wissington.

Conclusion on our assessment of the effect of the change of circumstances on the SLC

- 5.81 Based on our assessment in paragraphs 5.7 to 5.80, we conclude that the change of circumstances has not removed the likelihood of GrowHow being able to raise the price of raw CO₂ using the threat of termination of the Ince Agreement.

Our assessment of the effect of the change of circumstances on the Undertakings

- 5.82 In this section, based on our finding of the effect of the change of circumstances on the adverse effects of the merger (see paragraph 5.81), we consider whether it is appropriate to vary or release the Undertakings. We consider first paragraphs 8 to 10 of the Undertakings, since these relate to the key requirements. We then consider paragraph 7 relating to the Confidentiality Guidelines and paragraph 11 on renegotiating the Ince Agreement. In each case we set out GrowHow's views, Air Liquide's views, the OFT's advice and our assessment.

Paragraphs 8 to 10 of the Undertakings

GrowHow's views

- 5.83 GrowHow made three arguments in favour of releasing the parties from paragraphs 8 to 10 of the Undertakings:
- (a) It said that the SLC identified by the CC applied to the market for the supply of liquid CO₂, and that, as a result of the closure of the Severnside facility and the divestment of the Billingham liquefaction facility, GrowHow was no longer present in the market and no longer had the ability to control ex-works prices of liquid CO₂.
 - (b) It said that the CC's willingness to consider in our 2007 report the divestment of the liquefaction plant at Billingham as an acceptable remedy showed that the subsequent exit of GrowHow from Billingham meant that any additional behavioural remedy was not necessary.
 - (c) It said that because the Confidentiality Guidelines were of limited duration, and had provision for termination if GrowHow divested the liquefaction plant at Billingham and closed the facility at Severnside, this was evidence that the CC had contemplated that the CO₂ obligations should cease once the relevant events had taken place.

Air Liquide's views

- 5.84 In addition to its views in paragraph 4.7, Air Liquide submitted that as a result of the Yara acquisition and Yara's new liquefaction plant at Wilton, the Undertakings not only needed to be maintained, but also to be strengthened.⁶⁷

⁶⁷OFT advice, paragraph 175.

The OFT's advice

- 5.85 The OFT concluded that paragraphs 8 to 10 should not be released because the closure of Severnside and the divestment of the liquefaction plant at Billingham had not removed the basis for the SLC arising in respect of raw CO₂.

Our assessment

- 5.86 We considered each of the reasons for release from paragraphs 8 to 10 of the Undertakings raised by GrowHow in paragraph 5.83.

- *Removal of SLC*

- 5.87 We found in paragraph 5.81 that theory of harm (c) still holds, such that GrowHow could threaten to terminate the Ince Agreement in order to force Air Liquide to accept a higher price for raw CO₂.

- 5.88 We considered whether a sunset clause might be appropriate given the expiry of Yara's Billingham call option at [X] potentially changing the viability of Billingham as an alternative source of supply. However, given that we found in paragraph 5.53 that it is uncertain what outcome will arise following the expiry of Yara's Billingham call option, we cannot form an expectation that the SLC will no longer apply at that point in time. A sunset clause would therefore not be appropriate.

- *Divestiture of Billingham as an alternative remedy*

- 5.89 GrowHow noted the conclusion in our 2007 report that 'whilst the pool of suitable potential purchasers would be likely to be very small, a divestment of Terra's CO₂ liquefaction facilities combined with suitable behavioural undertakings would nevertheless constitute an effective remedy'.⁶⁸

- 5.90 GrowHow said that the Billingham plant had been sold to Azelis as a result of the European Commission's remedy in the Yara/Kemira case with volume and price commitments in relation to the supply of raw CO₂ and an operating and maintenance agreement. It added that these were the only 'behavioural' remedies mentioned in our 2007 report. According to GrowHow, the finding in our 2007 report that divestment of Billingham could be an effective remedy provided 'cogent evidence that an actual disposal of the Billingham CO₂ business upon exactly the terms contemplated by the CC (and implemented by the European Commission) would indeed address fully the SLC and remove the need for the Undertakings'.

- 5.91 We are not convinced by GrowHow's argument in relation to the divestment of Billingham now remedying the SLC identified in our 2007 report. Although our 2007 report envisaged that any divestiture of the Billingham liquefaction plant would be accompanied by behavioural restrictions, it did not envisage that if there were such a sale a call option would be granted to an undertaking in the position of Yara. Yara's Billingham call option is relevant to our assessment of the continuing relevance of the Undertakings and in our view undermines the divestiture of Billingham as an effective remedy:

(a) Yara now owns 50 per cent of GrowHow. In our view, the fact that much of the liquid CO₂ output at Billingham is effectively under the control of one of the two

⁶⁸Our 2007 report, paragraph 15.90.

owners of GrowHow impedes the ability of Azelis to act as a constraint on GrowHow (see paragraphs 5.42 to 5.53).

(b) Yara might exert influence over the prices at which Azelis supplied CO₂ to its other customers. If Yara were to limit its uptake of CO₂ from Billingham while reserving its call option, Azelis would ultimately have to cover the fixed costs of CO₂ production by raising its prices to its other customers.

- *Relationship of paragraphs 8 to 10 with paragraph 7 of the Undertakings*

5.92 We agree with the OFT's advice that 'there is no evidentiary support that can be gleaned from the stated limited duration of the Confidentiality Policy Guidelines as regards paragraphs 8 to 10 of the Undertakings'.⁶⁹

Conclusion on paragraphs 8 to 10 of the Undertakings

5.93 For the reasons in paragraphs 5.86 to 5.92, our view is that it is not appropriate to vary or release paragraphs 8 to 10 of the Undertakings.

Paragraph 7 of the Undertakings

GrowHow's views

5.94 GrowHow said that it should be released from paragraph 7 of the Undertakings because it was no longer present in the supply of liquid CO₂. It argued that it now met the conditions of the duration clause in the Confidentiality Guidelines, which stated that 'These Guidelines ... shall continue in force until such time as ... the JV has divested the CO₂ liquefaction plant at Billingham and has also permanently ceased production of raw CO₂ at Severnside'.⁷⁰

Air Liquide's views

5.95 Air Liquide said that the Confidentiality Guidelines were still needed in order to maintain Air Liquide's negotiating position relating to purchases of liquid CO₂ from Billingham. It also said that, because the prohibition in paragraph 7.1 of the Undertakings referred to 'production' and because this word had been added to the Undertakings after consultation, the CC intended paragraph 7 of the Undertakings to remain in force provided GrowHow was still involved in the production of liquid CO₂. It added that GrowHow was still present in the production of liquid CO₂ because it operated the Billingham liquefaction plant on behalf of Azelis.⁷¹

5.96 Air Liquide accepted that the Confidentiality Guidelines had terminated, but said that paragraph 7 of the Undertakings should remain notwithstanding the termination of the Confidentiality Guidelines. Its reasons for this were that in any conflict between the two the Undertakings should prevail; that the Undertakings would have remained in force if the Confidentiality Guidelines had not come into force; and that the Undertakings were effective and enforceable during the three-month period while the Confidentiality Guidelines were being negotiated.

⁶⁹OFT advice, paragraph 99.

⁷⁰Confidentiality Policy Guidelines, Clause 2.

⁷¹OFT advice, paragraphs 155 & 156.

The OFT's advice

- 5.97 The OFT found that there was no justification for the information exchange barrier between GrowHow, and Air Liquide and Azelis now that GrowHow was no longer present in the supply of liquid CO₂. The OFT concluded that the closure of Severnside and the divestment of Billingham were a change of circumstances as a result of which paragraph 7 of the Undertakings was no longer applicable and that GrowHow should be released from it.

Our assessment

- 5.98 We note the mismatch in duration between the Undertakings and the Confidentiality Guidelines, and the current situation whereby the Undertakings remain in force but the Confidentiality Guidelines have expired because the CO₂ liquefaction plant at Billingham has been divested and GrowHow has permanently ceased production of raw CO₂ at Severnside (see paragraph 3.9(b)). We also note Air Liquide's point that paragraph 7 of the Undertakings should remain notwithstanding the termination of the Confidentiality Guidelines and that the Undertakings had been in effect during the period before the Confidentiality Guidelines were approved.
- 5.99 In our view, the termination of the Confidentiality Guidelines does not automatically mean that paragraph 7 no longer applies. We have therefore considered the need for paragraph 7 in the light of the change of circumstances.
- 5.100 In order to decide whether paragraph 7 of the Undertakings should be released, we have considered its purpose, and specifically whether it is intended solely to protect Air Liquide's position in negotiating the purchase of liquid CO₂ from Billingham, or whether the protection is wider.
- 5.101 The Confidentiality Guidelines were drawn up and submitted by GrowHow and approved by the CC as part of the remedies implementation process following our 2007 report. While the Undertakings were signed in September 2007, shortly before the announcement of the European Commission's decision in the Yara/Kemira transaction, the Confidentiality Guidelines were submitted and approved in December 2007, by which time the CC was aware of the undertaking given by Yara to procure the divestment of the liquefaction plant at Billingham.
- 5.102 It is clear to us that, in accepting the clause which terminated the Confidentiality Guidelines on the closure of Severnside and divestment of the liquefaction plant at Billingham, the CC did not see a need for a detailed undertaking on confidentiality once GrowHow was no longer present in the sale of liquid CO₂. The Undertakings were accepted by the CC before the announcement of the conditional clearance of the Yara/Kemira transaction and the proposed divestment of the liquefaction plant at Billingham, giving it no reason to limit the duration of paragraph 7.
- 5.103 Evidence for the CC's view that paragraph 7 was necessary only because of GrowHow's position as a seller of liquid CO₂ can also be found in the discussion of remedies in our 2007 report: 'In addition, we consider that ... Chinese walls would be necessary, as the JV and Air Liquide both sell CO₂ to distributors and are therefore direct competitors; and to maintain Air Liquide's negotiating position in relation to its purchases of CO₂ from Terra.'⁷²
- 5.104 With regard to Air Liquide's points in paragraph 5.95:

⁷²Our 2007 report, paragraph 15.80.

- (a) We do not consider that it necessarily follows that the CC's inclusion of 'production' within the functions covered by paragraph 7 of the Undertakings was indicative of a wider scope, and that it is conceivable that it was included in order to make the remedy sufficiently comprehensive. It is also unclear how the sharing of production information would weaken Air Liquide's position given that it negotiates with Azelis for liquid CO₂ at Billingham.
- (b) We have already set out our reasoning in paragraphs 5.8 and 5.9 that even though GrowHow provides raw CO₂ at Billingham and operates the liquefaction plant, it does not sell liquid CO₂ to distributors because it has divested the liquefaction plant at Billingham.

Conclusion on paragraph 7 of the Undertakings

- 5.105 In conclusion, for the reasons set out in paragraphs 5.101 to 5.104, we find that there is no ongoing justification for paragraph 7 of the Undertakings, and consider that as a result of a change of circumstances arising from the divestment of the liquefaction plant at Billingham, GrowHow should be released from paragraph 7 of the Undertakings.

Paragraph 11 of the Undertakings

GrowHow's views

- 5.106 GrowHow said that paragraph 11 of the Undertakings had expired, and that it should be released from this requirement as a matter of good administration.

Air Liquide's views

- 5.107 Air Liquide agreed that, on its face, paragraph 11 of the Undertakings had expired, but noted that GrowHow had not complied with its obligations to enter into a new lease with Air Liquide at Ince within the three-month period, as required by paragraph 8.2 of the Undertakings, but had subsequently done so in January 2010.

The OFT's advice

- 5.108 The OFT noted that paragraph 11 of the Undertakings had expired, and that whether or not GrowHow had complied with its obligations regarding the new lease (as required by paragraph 8.2), this did not affect the ongoing operation of paragraph 11. It concluded that, for reasons of good administrative practice and for the avoidance of doubt only, GrowHow should be released from this paragraph.

Conclusion on paragraph 11 of the Undertakings

- 5.109 We agree with the OFT that paragraph 11 of the Undertakings was time limited and has now expired. Consequently, for reasons of administrative good practice and for the avoidance of any doubt, we conclude that GrowHow should be released from paragraph 11 of the Undertakings.

6. Our conclusion

- 6.1 The OFT identified a change of circumstances for the purposes of section 92(2)(b) of the Act in the form of the closure of the Severnside plant, the sale to Azelis of the CO₂ liquefaction plant at Billingham and the acquisition of Kemira by Yara.

6.2 Having considered the change of circumstances, we concluded that:

- (a) Notwithstanding the change of circumstances and for the reasons in paragraph 5.93, it is not appropriate to vary or release the obligations in paragraphs 8 to 10 of the Undertakings.
- (b) As a result of the change of circumstances and for the reasons in paragraph 5.105, the parties should be released from the obligations in paragraph 7 of the Undertakings.
- (c) Paragraph 11 of the Undertakings no longer has practical effect; for the avoidance of doubt and good administrative practice, we will release the parties from the obligations in this paragraph of the Undertakings.

Switching analysis

TABLE 1 **GrowHow's incentives to increase prices in the absence of the Undertakings**

[X]

Source: GrowHow, CC analysis.

TABLE 2 **Air Liquide's incentives to switch to Azelis if GrowHow's supply price was increased**

[X]

Source: GrowHow and Air Liquide, CC analysis.

Notes:

1. If any of the scenarios produces lower costs than the base case scenario, Air Liquide has an incentive to switch the relevant amount of capacity to Azelis.
2. [X]

TABLE 3 **Assumptions that GrowHow can make about Air Liquide's incentive to switch some of its volumes to Azelis**

Threshold for GrowHow's decision to increase prices at Ince (ie if GrowHow can assume that Air Liquide's supply price at Billingham is equal or higher than this threshold, GrowHow will be able to increase the supply price or raw CO₂ at Ince)

[X]

Source: GrowHow, CC analysis.

Note: If any of the scenarios produces lower costs than the base case scenario, Air Liquide has an incentive to switch the relevant amount of capacity to Azelis.