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*Case No COMP/M.1693 -
Alcoa/Reynolds*

Only the English text is available and authentic.

**REGULATION (EEC) No 4064/89
MERGER PROCEDURE**

Article 8(2)
Date: 03/05/2000

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NON-CONFIDENTIAL

Commission Decision

of 03.05.2000

**declaring a concentration to be compatible with the common market
and the EEA Agreement**

Council Regulation (EEC) No 4064/89

Case No COMP/M.1693 - Alcoa/Reynolds

(Only the English text is authentic)

(Text with EEA relevance)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to the Agreement on the European Economic Area, and in particular Article 57 thereof,

Having regard to Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings¹, as amended by Council Regulation (EC) No 1310/97 of 30 June 1997², and in particular Article 8(2) thereof,

¹ OJ L 395, 30.12.1989, p. 1; corrected version OJ L 257, 21.9.1990, p. 13

Having regard to the Commission decision of 20 December 1999 to initiate proceedings in this case,

Having given the undertakings concerned the opportunity to make known their views on the objections raised by the Commission,

Having regard to the opinion of the Advisory Committee on Concentrations³,

WHEREAS :

1. On 18 November 1999, the Commission received notification of a proposed concentration by which Alcoa Inc. (“Alcoa”) would acquire control of the undertaking Reynolds Metals Company (“Reynolds”) and would merge their activities world-wide.
2. By decision dated 20 December 1999, the Commission found that the notified operation raised serious doubts as to its compatibility with the common market and the functioning of the EEA. The Commission accordingly initiated proceedings in this case, pursuant to Article 6(1)(c) of Regulation (EEC) No 4064/89 (hereinafter referred to as the “Merger Regulation”).

I. THE PARTIES AND THE OPERATION

3. Alcoa is the largest aluminium producer world-wide, and is a US corporation involved in all aspects of the aluminium industry (bauxite mining, alumina refining, aluminium smelting, manufacturing and recycling as well as research and technology). Alcoa has operations in among others, North America, Brazil, Australia, Japan, China and the European Community.
4. Reynolds is a US corporation also involved in all aspects of the aluminium industry (bauxite mining, alumina refining, aluminium smelting, manufacturing and recycling, packaging, as well as research and technology). Reynolds has operations in various parts of the world.
5. On 18 August 1999 Alcoa and Reynolds agreed to a merger, known as the “Agreement and Plan of Merger” whereby the outstanding voting securities of Reynolds are to be exchanged for voting securities of Alcoa. Alcoa has to this end created a merger subsidiary which will merge with Reynolds, and Alcoa will exchange 1.06 shares of Alcoa common stock for each share of Reynolds common stock. Reynolds will thereby become a wholly-owned subsidiary of Alcoa, and thus Alcoa will acquire sole control over Reynolds. The Boards of Directors of Alcoa and Reynolds have approved the transaction, which is valued at USD 4.8 billion. It is therefore concluded that the proposed operation constitutes a concentration within the meaning of Article 3(1)(b) of the Merger Regulation.

II. COMMUNITY DIMENSION

² OJ L 180, 9.7.1997, p. 1.

³ OJ C2000. , p....

6. The undertakings concerned have a combined aggregate world-wide turnover of more than EUR 5 billion⁴. Alcoa and Reynolds each have a Community-wide turnover in excess of EUR 250 million (Alcoa: EUR 2,482 million; Reynolds: EUR 527 million), but they do not achieve more than two-thirds of their aggregate Community-wide turnover within one and the same Member State. The notified operation therefore has a Community dimension within the meaning of Article 1(2) of the Merger Regulation and is a case for EEA co-operation.

III. COMPETITIVE ASSESSMENT

7. On the basis of the notification and the market investigation, the Commission has reached the conclusion that the proposed concentration will lead to the creation of dominant positions in the following markets: smelter-grade alumina, commodity hydrate and high-purity P0404 aluminium.
8. The merging parties are vertically integrated companies, with activities at all stages of the aluminium supply chain. They produce and sell bauxite, hydrate, smelter-grade alumina, and aluminium, which is semi-finished or finished by flat rolling, extruding, casting or forging. In each of the semi-finished and finished segments, the products are often tailored by producers to meet the specifications of the end users with respect to criteria such as thickness or “gauge”, shape, strength and surface appearance. Semi-finished and finished aluminium products are often used in a wide range of end-use applications, including the transportation industry, building and construction industry, the container and packaging industry and in the electrical industry.

A. SMELTER-GRADE ALUMINA

Product market definition

9. In previous decisions⁵, the Commission has defined alumina as constituting a relevant product market. Alumina is a white powder principally used in smelters to produce aluminium. Alumina is produced out of bauxite ore by a refining process, the so-called Bayer process. The refining of alumina requires four stages: digestion, clarification, precipitation and calcination. Precipitation is a drying process (the elimination of the water from the surface of the alumina crystals), after which the product can be removed and sold as aluminium hydroxide or alumina hydrate. Alumina hydrate sold at this stage is used in chemical applications. Such chemical grade alumina (CGA) is referred to as commodity hydrate, or, if further processed, speciality hydrate. Most of the aluminium hydroxide (generally about 90%) is further dried by calcination (elimination of the water within the crystals). The alumina resulting from this process is calcined alumina. More than ninety per cent of the calcined alumina will be used in the smelting of aluminium metal, which is why it is called metallurgical or smelter-grade alumina (SGA). The reminder is further processed and used in chemical applications. In 1998, SGA accounted for 91.2% of

⁴ Turnover calculated in accordance with Article 5(1) of the Merger Regulation and the Commission Notice on the calculation of turnover (OJ C66, 2.3.1998, p25). To the extent that figures include turnover for the period before 1. January 1999, they are calculated on the basis of average ECU exchange rates and translated into EUR on a one-for-one basis.

⁵ See cases IV/M.470 - Gencor/Shell, Decision of 29 August 1994 (OJ C271, 29.9.1994, p. 3); and IV/M.1003 Alcoa/Inespal, Decision of 24 October 1997 (OJ C29, 27.1.1998, p. 7)

the total world-wide alumina production and CGA made up the remaining 8.8%. Therefore, alumina can be divided into two different grades, that is, smelter-grade alumina (SGA) and chemical-grade alumina (CGA). As will be shown below, these two products constitute separate product markets.

Supply side considerations

10. Both CGA and SGA derive from the same production process. Chemical alumina hydrate (CGA) is an intermediate product of the SGA production process. All SGA producers also produce chemical grade alumina (hydrate). However, in order to increase production of SGA at the expense of CGA, refineries would have to install additional calcination equipment, since refineries normally run at full capacity in order to be cost-efficient. CGA is a feedstock product, which is generally of a higher purity level than SGA. It is used to manufacture aluminium chemicals (namely, catalysts, additives for toothpaste and cement, water treatment), refractors used in steel-making and other speciality products. The prices of the two grades differ substantially. CGA may cost twice as much as SGA. Therefore, a shift of production towards SGA may result in an economic penalty. The Commission investigation has brought up no historical evidence that CGA capacity has ever been shifted in significant quantities to make SGA. This is also supported by the fact that these products cannot be used for the same end uses.
11. There is also no other production process which could be easily and rapidly turned towards SGA. Therefore, the Commission considers that there is no supply-side substitution between CGA and SGA.

Demand-side considerations

12. The demand for SGA depends fully on the production of primary aluminium, which in turn depends on SGA supply. There are no substitutes for SGA nor can SGA be used for other purposes than the production of primary aluminium. While this could indicate that there is a certain degree of mutual dependency between suppliers and customers of SGA, there is, in fact, a considerable imbalance between the two sides, since it is more costly to leave smelting capacity idle than refinery capacity.
13. World production of smelter-grade alumina was about 45 million tonnes in 1999. However, a large part of this alumina was consumed by integrated firms that also own smelters. Because of the existence of integrated alumina refiners, most competitors and customers questioned agree that there is a need to distinguish between alumina used captively and alumina sold to the merchant market - that is, surplus alumina that is not used internally by integrated producers and which is made available for sales to third parties, independent smelters such as Hoogovens, Southwire or Dubal. Approximately two-thirds of the world-wide SGA production is for captive use by integrated firms, such as Alcoa, Reynolds, Kaiser and Alcan. Production for captive use is not available to buyers on the merchant market. As a consequence, captive-use production, according to many companies questioned, should be excluded from the relevant product market. Captive-use production cannot be made available to the merchant market even if the price for SGA were to increase significantly. Integrated firms would not divert production of SGA away from their own captive use. Doing so would have as a consequence that their smelters would run at less than full capacity, which would result in a cost penalty that would not be recouped even in the event of a substantial price increase in SGA. Primary aluminium sells at roughly eight times the price of SGA. According to the Commission's investigation, even in the event of high rises in the SGA spot-market prices, when calculating avoidable costs for an

aluminium smelter (that is, costs that would not be incurred if aluminium production were reduced on a temporary basis: energy, raw material and labour) plus costs that might be incurred as a result of closure and restart procedures, it is shown that lost profit (due to sales of captive-use alumina to the merchant market instead of production of aluminium) is always higher than the possible benefits obtained from increased alumina sales by integrated producers. Respondents to the Commission's questionnaires were not aware of any instance during times of tight supply of SGA where any integrated manufacturer shifted supply away from its captive use in favour of the merchant market. Therefore, the Commission, in its assessment, does not take into account smelter grade alumina, which is used captively.

14. The world-wide merchant market for SGA (or surplus alumina) is now about 33% of total production (14.5 million tons in 1999 and is, according to CRU, expected to be 16.4 million tons in 2003). The merchant market comprises medium and long-term contracts and the spot market and excludes alumina for captive use. Medium-term contracts have a duration of typically 2-5 years. Long-term contracts are normally concluded for a period of 5 to 10 years, but can also run for up to 20 years. Such contracts are priced on a percentage rate of the LME⁶ price for primary aluminium. This percentage can be either a fixed rate, for instance 12.5%, or a spread, referred to as a put/call clause, for instance 11%-14%. The customer is able to call for the supply at the upper boundary, whereas the seller is able to put the volume at the lower boundary of the spread. In other words, with a put/call clause the buyer of the alumina is obliged to buy at the lowest percentage rate of the spread and can refuse to buy if the seller increases the price towards the higher end of the spread. Long-term contracts with a put/call clause require price negotiations at predetermined intervals, usually on a yearly basis after an initial period where the price is based on a fixed percentage of the LME aluminium price. Long-term contracts with a put/call clause are, therefore, sensitive to the overall market situation (that is, supply, demand and the LME).
15. The spot market comprises contracts with a duration of less than a year, sometimes representing only a single cargo or several vessels, at the prevailing spot market price. The spot market absorbs variations in refinery production above or below the level of fixed commitments as well as variations in customers' takes under long term contracts. The spot market is reportedly used mainly by Russian and Chinese smelters. The spot market accounts for only 5%-10% of the merchant market. However, price developments in the spot market have an impact on price negotiations for long-term contracts, since they serve as an indicator of the general market equilibrium. When spot prices are high, market participants get the impression that they are in a "seller's market".
16. The parties consider that the definition of the product market should exclude long-term contracts, because these arrangements make enormous quantities of alumina unavailable to third parties. The parties propose therefore to focus the examination on the market for « available alumina ». According to this analysis they calculate that their market shares would be [25%-35%]* in 2000 and [30%-40%]* in 2003. Nevertheless, it has to be borne in mind that « long term » alumina contracts do not

⁶ London Metal Exchange.

* Parts of this text have been edited to ensure that confidential information is not disclosed; those parts are enclosed in square brackets and marked with an asterisk.

insulate buyers or sellers from industry price fluctuations. A large amount of price flexibility is built into these contracts. First, alumina contract prices are normally tied to market prices, such as LME aluminium prices. Therefore, aluminium price changes would alter the prices that smelters pay for alumina. It has been found that, in the past, announcements of aluminium production capacity reductions have had a relatively greater influence in raising LME prices than restarts of capacity have had in reducing them. Accordingly, the parties could easily announce capacity cuts having an impact on LME, which would not be offset by similar capacity increases announced by other enterprises active in the aluminium sector. Second, as was mentioned in paragraph 14, medium and long-term contracts do not always contain a fixed-price clause linked to LME but a put/call range and annual price renegotiations. Therefore, the price may fluctuate throughout the duration of a contract, thereby reflecting the economics of the availability of the merchant market. It has been estimated that around 40% of all contracts contain such a put/call clause.

Conclusion

17. On the basis of the preceding points and taking into account the market investigation, the Commission has reached the preliminary conclusion that the relevant market for alumina is the « merchant market » or market for surplus alumina, including medium and long term contract as well as spot sales.

Relevant geographic market

18. Smelter-grade alumina (SGA) is traded in a world-wide market. There are significant trade flows between geographic regions. Most of the alumina refineries are built close to bauxite mines, so as to avoid uneconomical long distance transportation of bauxite ores. Alumina is then shipped to aluminium smelters located in various parts of the world. In the western world, the total third party market for producers of alumina (the merchant market) includes sales to eastern countries. Western alumina producers supply 10.8 million tonnes to the Western merchant market and 4 million tonnes to Eastern Europe, CIS and China.⁷
19. On the other hand, all surplus alumina of refineries in Eastern Europe, CIS and China is always sold to local plants. According to the metals expert James F. King, the merchant market in Eastern Europe and China accounted for 2.3 million tonnes. There are no exports to Western smelters. Trade of alumina from western to eastern countries exists whereas there is no trade from eastern countries to western countries, mainly owing to the deficit of alumina in those geographic areas, but also to the lower quality of alumina produced in such areas. Consequently, any surplus alumina from those refineries is not available for western smelters. For the purposes of the analysis of the SGA merchant market, the Commission will only take into account surplus SGA produced by western refineries.

Competitive assessment

Market situation

20. SGA refineries supply aluminium smelters. Surplus alumina is sold to non-integrated companies, integrated companies that have a deficit of alumina or to trading

⁷ Source: The market for alumina – Current trends and future prospects, James F. King, October 1999, p.70

organisations, which actively buy and sell SGA. The following table depicts the market situation in 1999:

	Total Production (in million tons)	% of world production	Surplus (in million tons)	% of merchant market
Alcoa	[%]*	[%]*	[]*	[%]*
Alcan	[]*	[%]*	[]*	[%]*
Reynolds	[]*	[%]*	[]*	[%]*
Kaiser	[]*	[%]*	[]*	[%]*
Pechiney	[]*	[%]*	[]*	[%]*
Billiton	[]*	[%]*	[]*	[%]*
Alusuisse	[]*	[%]*	[]*	[%]*
Glencore	[]*	[%]*	[]*	[%]*
Jamaica	[]*	[%]*	[]*	[%]*
Guinea	[]*	[%]*	[]*	[%]*
India	[]*	[%]*	[]*	[%]*
Others	[]*	[%]*	[]*	[%]*
Former Eastern Countries and China	[]*	[%]*	[]*	[%]*
Total	45	100	14,5	100

21. As can be seen from the above table, the merged entity would be by far the largest player in the merchant market for alumina, with a market share of [45%-55%]*. The next rival would be Kaiser with [5%-15%]*, only a []* of the size of the parties. This figure alone is indicative of the market power that the merged entity would acquire as a result of the merger. Other competitors are Glencore with [less than 10%]*, Alusuisse with [less than 10%]*, the Guinean Government and the Jamaican Government with [less than 10%]* each. While the supply side is highly concentrated (C3 of 65%), the demand side is not. There is no non-integrated aluminium producer with a market share of more than 5%. Therefore, there appears to be no countervailing buyer power on the side of aluminium smelters.

Post-merger competition

22. The own-price elasticity of demand is extremely low. It has been estimated to be as low as -0.146 .⁸ Customers of alumina cannot use an alternative input to produce aluminium metal. Customers also have no choice in the short run to switch to another supplier. Since aluminium smelters cannot realistically be converted to any other use the smelter has only the option to shut down or accept a price increase. As long as the price of alumina does not force the smelter to run at an actual loss, the smelter has no option but to continue purchasing alumina. Since the cost of alumina represents only 25% of a smelter's total cost, smelter's profits are not extremely sensitive to alumina price rises. The following table shows the various cost items (western world average) to produce 1 tonne of aluminium.⁹

⁸ Estimation by Dr. Kahwaty, LECG, February 2000

⁹ Source: see footnote 7; at p. 37

Item	Cost (US\$/t)
Alumina	375
Other raw materials	182
Energy	306
Labour & Overheads	329
Capital Charges	209
Total Cost	1401

Source : James King

23. Because alumina represents about 25% of a smelter's overall cost¹⁰, a permanent increase of 10% in the price of alumina will result in an increase of total costs of only 2.5%. As long as profit margins of smelters are higher than 2.5% prior to such a price increase, the smelter will still make profits. It is therefore quite unlikely that an increase in alumina prices by 5-10% will drive smelters out of business.
24. The only short-term possibility for a smelter to get alumina is the spot market. While quantities traded in the spot market are small, this market nevertheless serves as an important indicator for price negotiations for both new long-term contracts and annual renegotiations during long-term contracts. In a tight market suppliers are able to impose higher prices by either pushing up the call price (that is, the upper range of a spread) or negotiating higher prices in the first place. The explosion of Kaiser's Gramercy plant in July 1999 serves as an illustration. The explosion took 1 million tonnes of SGA out of the market. This is equivalent to 2% of world production or 7% of Western third-party sales. Immediately after that explosion, the spot market rose from an average of 160\$/ton to 205\$/ton. This is an increase of 34%. Prices continued to rise and reached 360 to 370\$/ton in December 1999. This development in the spot market has an immediate impact on negotiations for long-term contracts. By way of example, the recent contract between the Brazilian alumina supplier Alunorte and Pechiney and Glencore has been concluded at 15% of the LME price, compared to the previous levels of around 11%-12.5%. CRU reports another recent 3-year contract, which has been concluded at 14.2%. Even if most long-term contracts have a spread of only 1 percentage point, an increase from say 12.5% to 13.5% LME following the annual renegotiations will result in an increase of 8% of the price of alumina.
25. This example shows that with a cutback of 7% of SGA, surplus production prices in the spot market go up by a multiple of that percentage figure. Therefore, a large player would be able to raise spot prices significantly with relatively little cutback in production. While higher prices in the spot market may not, by themselves, be a great reward given the small size of this segment, it pays off with regard to long-term contracts. The merged firm would be in the best position following the merger to induce such a price increase by shutting down existing SGA capacity. As the following table shows, the merged entity would control the bottom end refineries in terms of operating costs.¹¹ Operating costs comprise the raw material cost for the bauxite plus the cost of converting the bauxite into alumina. Moreover, it has to be borne in mind that the average price of alumina for consumption in the merchant

¹⁰ Source: "World Capacity and Market Report, Primary Aluminium", James F. King, August 1999, p. 5

¹¹ Source: CRU Report "Aluminium Cost service 1999-2000, Alumina Refining Costs to 2002, page 45.

market was USD 175 per ton FOB in 1999 for long term contracts and USD 189 per ton in the spot market.

Plant	Country	Owner	Capacity (kt)	Operating Cost (US\$/t)
Wagerup	Australia/Darling Range	Alcoa 60%	1.900	90,8
Worsley	Australia/Darling Range	Reynolds 56% Billiton 30%	1.880	91,3
Pinjara	Australia/Darling Range	Alcoa 60%	3.200	98,5
Pocos de Caldos	Brasil	Alcoa 100%	216	104,8
Damanjodi	India	Nalco 100%	941	107,2
Belgaum	India	Indalco 65%; Alcan 35%	153	109,8
Gladstone (QAL)	Australia	Comalco 30%; Kaiser 28%; Alcan 21%, Pechiney 20%	3.465	116,6
Alunorte	Brazil	Hydro 25%	1.476	118,6
Gove	Australia	Alusuisse 70%	1.816	119,8
Sao Louis (Alumar)	Brasil	Alcoa 54%; Billiton 36%; Alcan 10%	1.140	120,8
Clarendon (Jamalco)	Jamaica	Alcoa 50%, JBI 50%	932	126,2
Kwinana	Australia	Alcoa 60%	1.935	126,6
Paranam	Surinam	Alcoa 55%; Billiton 45%	1.825	131,8
Friguia-Kimbo	Guinea	Guinea 90%; Reynolds 10%	600	135,9
Ewarton	Jamaica	Alcan 93%; JBI 7%	550	152,4
Kirkvine	Jamaica	Alcan 93%; JBI 7%	550	153
San Ciprian	Spain	Alcoa 100%	1.150	155,8
Auginish	Ireland	Glencore 100%	1.360	161
Point Comfort	USA	Alcoa 100%	2.318	163,8
Eurallumina	Italy	Comalco 56%; Glencore 44%	975	166
Stade	Germany	VAW 50%; Reynolds 50%	750	169,9
Distomon	Greece	Pechiney 60%	720	170,3
Burnside	USA	Ormet 100%	595	171,3
St.Croix	USA	Alcoa 100%	600	179,5
Corpus Christi	USA	Reynolds 100%	1.600	185,8
Gardanne	France	Pechiney 100%	600	200,2
Gramercy	USA	Kaiser 100%	926	214,6

Source: CRU

26. Gramercy ceased production in July 1999, owing to an explosion. There are considerable doubts whether Gramercy will restart production by the end of 2000 and resume full production in 2001, as Kaiser claims, given the many problems Kaiser is currently facing.¹² Gardanne already produces mostly chemical-grade alumina and might cease production of SGA entirely. Consequently, the merged entity would

¹² Although the web site of Kaiser displays a photograph showing preparatory re-construction work being carried out (ex., scaffoldings, etc.), it has been reported in the press that the US Mine Safe and Health Administration (MSHA) might begin a criminal investigation of the explosion. This would endanger the pay-out of the insured capital needed to fund the project. Kaiser was, however, able to obtain the environmental permit from the Louisiana Department of Environmental Quality.

control 2,200kt¹³ of high-cost refineries, which can be used as swing facilities. Alcoa could, for instance, use St. Croix as swing capacity and cut back on production when prices are low. In fact, St. Croix did not produce any SGA between 1995 and 1997. St. Croix has a capacity of 600kt - about two thirds of Gramercy - which would certainly be sufficient to influence spot prices and thereby, indirectly, prices for long-term contracts, as the Gramercy example has shown. Such a strategy becomes profitable for a supplier whenever the lost profits of the refinery where it cuts back production are lower than the increase in profits made by all its other refineries with average costs below those of the swing plant. Since Alcoa has the largest portfolio of low-cost refineries, it would benefit most from such a strategy. As a result, Alcoa will earn increased margins through its sales of alumina produced in its low-cost alumina plants.

27. Such a strategy would also serve a second purpose: it could be used as a means to deter new entry or expansion from incumbent producers. Any expansion would need at least 18 months lead-time. This is sufficient to restart the mothballed capacity, drive prices down again and make the expansion unprofitable. Indeed, internal documents of Alcoa show exactly such a line of reasoning with regard to both its St. Croix and Point Comfort high cost refineries.
28. Lastly, Alcoa/Reynolds would also benefit from such a strategy vis-à-vis its downstream rivals in the aluminium smelting business. Any increase in the price of smelter grade alumina will raise the costs of their rivals which are not vertically integrated. Even if prices of aluminium were to go up as well, as a consequence of a tight alumina market, total profits of integrated companies such as the merged entity would be higher relative to non-integrated aluminium companies conveying a competitive advantage to integrated companies. In other words, if higher alumina prices result in higher aluminium prices, this would be relatively more advantageous for integrated companies such as the parties.
29. As a result of the merger, the parties would not only have control over the high end of the industry cost curve but they would also own the top four refineries with the lowest operating cost. Accordingly, the merged entity would control both the lowest and the highest part of the cost curve of alumina refineries. In other words, they would control the base load facilities and the peaking or swing plants. According to the market investigation carried out by the Commission in 1999 the average alumina plant operating costs were USD 160/170 per ton. Alcoa's average operating costs were around USD []* per ton. This difference in cost comes from Alcoa's and Reynolds' alumina refineries in Australia, especially in the Darling Range, which are the lowest-cost refineries world-wide. The cost advantage of these refineries is mainly due to the bauxite¹⁴ reserves in western Australia, considered to be among the cheapest in the world¹⁵. Alcoa already today has the strongest presence in the Darling

¹³ Note: 'kt' means kilo-tons (thousand tons), whereas 'MT' means metric tons (not million tons)

¹⁴ Bauxite is a natural mineral ore containing around 30% to 60% aluminium oxide. Once mined, bauxite is refined to extract alumina

¹⁵ According to CRU the cheapest bauxite in the world expressed in US dollars (USD) per ton would be in Guinea (Friguia belonging to the Government USD 2/t), Australia (Gove belonging to Alusuisse with USD 2.55/t) and India (Belgaum belonging to Alcan and Indalco with USD 2.7t). The Darling Range mines would be next with an average of USD 5/t. The average price is ± USD 10/t. The most expensive bauxite in the world is in Greece (USD 25/t).

Range. Alcoa controls the Wagerup, Pinjara and Kwinana refineries, representing 14,9% of total world capacity. The acquisition of Reynolds would also bring the fourth plant in the Darling Range, Worsley, under Alcoa's control. Worsley accounts for 4% of total world capacity. The refineries in the Darling Range represent 19% of total world production at present. 17,1% of this production would be in the hands of Alcoa/Reynolds¹⁶, the remainder being shared among the parties' joint venture partners in these refineries.

Entry and Expansion

30. Alumina world capacity and production has grown constantly over the past and will continue to do so in order to match the increase in aluminium production. Western world aluminium consumption is expected to increase from 19,000kt in 1999 to 21,915kt in 2003, an increase of 2,907kt. In order to meet this growth in aluminium metal production, SGA production has to increase by 5,500kt. This requires an increase of around 1.500kt per year. Expansion of capacity comes either in the form of capacity « creep » through de-bottlenecking, through “brownfield” expansion at existing sites or through new, so called « greenfield » projects.
31. Greenfield projects are rather rare. Greenfield projects concern new refineries with an initial capacity of at least 1 million tonnes. The investment costs of such a new refinery are roughly USD 800 to 1,000 per ton. Therefore, capital costs equal almost USD 1 billion. Lead-time is at least 5 years from the decision to the first shipment of alumina. No greenfield expansions have taken place since 1995 when the Alunorte refinery in Brazil went on stream. Currently, there are two greenfield projects reported. The first one concerns the Utkal project in Orissa (India). The ownership consortium comprises Alcan, Norsk Hydro and Indal. The parties claim that construction will begin in 2001. However, as one partner of the consortium has told the Commission, no final decision has been made. There are still uncertainties about financing and social and environmental issues. In particular, there is increasing resistance by local indigenous communities. Consequently, production will start in 2005 at the earliest. This is clearly outside the time frame used by the Commission to assess the impact of potential competition on a proposed merger.
32. The second project is the new Comalco refinery. Comalco, a subsidiary of London-based Rio Tinto (RTZ) has a majority stake (67%) in the bauxite reserves in Weipa, Australia, which are considered to be among the best and cheapest in the world. However, Weipa is an extremely remote area with insufficient infrastructure. To date, the Weipa bauxite is not refined in situ but shipped to the refinery in Gladstone. Comalco is considering building a new refinery in either Gladstone or Malaysia. The decision on the location has still not been made. An eventual decision on the site does not mean that the project is already approved. Indeed, this project has been under discussion for many years and has yet not materialised. It appears that Comalco faces a dilemma in deciding on the site. If Malaysia is chosen the bauxite has to be shipped a long distance adding considerable transport costs. If the refinery is to be built in Gladstone then there is a need to install additional infrastructure to face the structural problems related to energy, and the bauxite has still to be transported from Weipa. A start of production in mid-2002 is therefore rather unlikely.

¹⁶ Although Alcoa has only 60% ownership interest in its three Darling Range refineries it is entitled to off-take 100% of the alumina produced.

33. Moreover, according to documents held by the Commission, the parties themselves do not believe that these projects are viable. Reynolds states in one of its documents that it will explore further expansion with the intention of stopping high-cost greenfield expansions, such as Comalco. Alcoa believes that greenfield investments need a long-term alumina price of around USD []* per ton for a normal [%]* return on capital (ROC). However, Alcoa itself does not think that USD []* per ton is a long-term price for alumina. Moreover, in the opinion of Alcoa, there are several million tonnes of brownfield expansions available around the world at USD 500-600 per ton per annum that are much better investments. These statements clearly show that there is an inducement price of USD []* per ton for greenfield expansion. Keeping prices below this threshold will deter greenfield entry, notably the two projects in India and Australia/Malaysia (Comalco). As shown above, Alcoa has the means to keep the price below the inducement price by applying the swing strategy.
34. Therefore, the Commission concludes that given the uncertainty of their realisation these two greenfield projects do not constitute a serious threat to the market power of the merged firm.
35. Brownfield expansions are expansions of existing sites by, normally, adding new capacity of between 100,000 and 1 million tonnes at a cost below USD 800 per ton. Lead-time is normally between 2 and 3 years. Experience shows that, with the exception of Alcoa, backward integration is the major driving force for refinery expansions. The Commission's enquiry has shown that most of the brownfield expansions currently underway are mainly intended to cover the internal needs of the major integrated producers. This will inhibit the growth of third parties' sales of alumina in the western world and will probably reduce the ratio of the merchant market for alumina compared with overall alumina production (as was stated in paragraph 13, the alumina sold in the merchant market is now one third of total production). Dependency on third-party suppliers will probably be reduced for the major western integrated smelters.
36. The parties are of the opinion that over the next 5 years the majority of expansions will be undertaken by companies other than the parties. The following table submitted by the parties shows the current status of all brownfield expansions in the Western world:

ALUMINA BROWNFIELD EXPANSION PROJECTS				
Location	Owner	Size (tpy)	Current status	Estimated completion
Wagerup (Australia)	Alcoa	[]*	Nearly complete	2000
Worsley (Australia)	Reynolds, Billiton, others	1 250 000	Nearly complete	2000
Gramercy USA (rebuild)	Kaiser	1 000 000	Underway	2000
Burnside (USA)	Ormet	400 000	Underway	2000
Damanjodi (India)	Nalco	700 000	Underway	2001
Alunorte (Brazil)	Hydro, Aluvale, CBA	825 000	Announced	2002
Sao Luis (Brazil)	Billiton (share)	635 000	Proposed	2003
Muri Bihar (India)	Indal	60 000	Announced	2002
Belgaum (India)	Indal	280 000	Announced	2004
Gove (Australia)	Alusuisse	400 000	Proposed	2003

Renunkoot (India)	Hindalco	210 000	Announced	2002
Ewarton, (Jamaica)	Alcan	1.000.000	Engineering study underway	2003 or 2004

37. Of these projects totalling 7.2 million tons of SGA, the parties would have only [15% - 25%]*. However, the expansion projects of the parties are all underway and will be completed on schedule. For most of the other listed projects the completion date is speculative and in those cases where the estimated completion date will fall into the year 2004 (Indal, Ewarton), clearly beyond what the Commission can take into account for merger analysis. Moreover, several of the large expansion projects are planned by integrated companies for their increased internal needs. Those companies, which include Alcan, share the incentive to increase the price of SGA with the parties, since such a move would increase the cost of their rivals, which are not integrated.
38. Looking at individual expansion projects, many of them do not enjoy a firm commitment to expansion by the owners of the refinery. Beginning with Kaiser, there is doubt as to the financial viability of the company. According to Ormet, the expansion of its Burnside refinery will be less than 100,000 tons, for the sole purpose of replacing its current purchases on the merchant market with in-house production. As regards Brazil, both the Alunorte and the Sao Luis project have not yet been decided upon. Moreover, in the case of Sao Luis, Alcoa is the majority owner of the refinery and has certain procedural rights, which can []*. As for Alcan's expansion option in Ewarton, Jamaica, this project is at a very early stage. Moreover, the expansion of 1 million tons will take place in several stages over a period of 7 years. Taking proper account of all these factors, the parties will have a much higher share of all proposed brownfield expansions. Moreover, these uncertainties over third-party projects give the parties the chance to react unilaterally by announcing new expansion projects in their refineries.
39. Indeed, it has been suggested by third parties that the parties would be in the best position to further expand their refining capacity, because they will control the Darling Range (Pinjarra, Kwinana, Wagerup and Worsley). According to those third parties, the Darling range is the most suitable place in the world for expansion because it has the lowest operating costs, low capital cost and is located in a politically stable environment. The parties, however, claim, that they do not have significant expansion plans in the years to come. Alcoa's strategy has been to control the low end of the industry cost curve through the acquisition of Reynolds instead of considering expansions that would be less profitable from an economic point of view.
40. However, even if the parties do not to have any immediate plans for further brownfield expansions they are without doubt in a position to expand swiftly if strategic considerations so suggest. While it seems to be true that Kwinana cannot be further expanded since it is now virtually surrounded by the city of Perth and no land for expansion is available, the other three refineries in the Darling range could be further expanded. Wagerup has currently a capacity of []* million tons and State permission to expand by []* million tons to []* million tons. An expansion of []* million tons is currently under way. With a capital cost per tonne of USD []* and very low operating costs this is an excellent expansion opportunity. This expansion opportunity is under active consideration by the parties. Pinjarra could be expanded by a further []* million tons. The parties claim that whilst this option is under study

it is unlikely to come about because []*. The capital cost of USD []* per ton is indeed []*. Moreover, the operating costs are among the lowest in the world. Therefore, applying a net present value calculation, this project would show a positive net present value. Lastly, Reynolds' Worsley plant could, after completion of its current expansion from 1.9 million tons to 3.1 million tons, be still further expanded to 4 million tons which is currently considered to be the operational limit for refineries. Consequently, the parties would have the opportunity to expand capacity in the Darling Range by another []* million tons within 2 years. These prime expansion opportunities alone would be equal to almost half of the extra demand for SGA generated by the growth in aluminium production and can be seen as a warning to anyone considering a large brownfield expansion. In other words, any announcement of an expansion in the Darling Range will have the effect of deterring competitors that have higher operating costs and less political stability from expanding.

41. Even if Pinjarra failed to obtain the environmental permits for expansion or if expansion in Worsley were to require a costly new conveyor belt to feed the bauxite into the refinery the parties have other highly attractive possibilities for expansion. One such option would be Sao Luis in Brazil, which has very low capital cost per tonne (USD []* per ton) and moderate operating costs.
42. Moreover, it should not be forgotten that the parties are partners in many refining joint ventures which gives them the possibility of either blocking expansions by other joint venture partners or making them more difficult.
43. Alcoa currently has ownership interests in 10 refineries. In nine of these refineries Alcoa has a majority interest or sole ownership. Only in Jamalco is Alcoa's share 50%. The situation for Reynolds, which has ownership interests in 4 refineries, (Worsley, Friguia, Sherwin and Stade) is similar, with the exception of the Guinean Friguia refinery, where it is a minority shareholder. Consequently, as regards expansion possibilities of other members of the ownership consortia where Alcoa and Reynolds have a stake it should be borne in mind that Reynolds has veto rights for []*, Alcoa has first refusal rights for []* and veto rights for []*. In addition, in Suralco/Suriname where Alcoa owns a [%]* stake and Billiton [%]*, Alcoa's interest cannot be reduced below [%]* through expansions, and it has first refusal rights for []*.
44. Alcoa/Reynolds' control over the low and high-cost refineries, including expansion possibilities in combination with its veto rights, would make the following strategy successful: the merged firm could delay brownfield expansion and at the same time close parts of its high-cost capacity to keep the market tight, leading to supra competitive prices for smelter grade alumina. In turn, the merged firm could maintain supra-competitive prices, as it could credibly act in such a way as to deter entry if any entry is motivated by the inflated price levels. The mere announcement of expansion on the part of the merged firm would have an impact on the market price for alumina, and as a result expansion business plans by other competitors would have to be reviewed in the light of future alumina prices. This would be in particular the case where the required return on investment of a third party expansion would not be achieved, as a result of depressed future alumina prices.
45. The following table shows the expected market shares for Alcoa, Reynolds and the other main players including all brownfield expansions and expansions through creep according to the Commission's investigation:

	1999	2000	2001	2002	2003
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Alcoa	48%	50%	44%	42%	44%
Reynolds	4%	6%	6%	6%	6%
Parties	52%	56%	50%	48%	50%
Kaiser	10%	8%	11%	11%	11%
Glencore	7%	8%	7%	7%	7%
Alusuisse	5%	3%	5%	4%	4%
Nalco	4%	4%	6%	6%	6%
Guinee Gov.	4%	4%	4%	4%	4%
Jamaic.Gov.	4%	4%	4%	4%	4%

46. This table assumes that Kaiser will rebuild its Gramercy, USA plant. However, there are some doubts in the industry as to whether this will actually happen, since Kaiser is in financial difficulties (see paragraph 26 above). If the parties were to put all current expansion possibilities in their Darling Range refineries (Wagerup, Pinjarra and Worsley) in practice they would meet [65%-75%]* of third party demand for SGA in the year 2003. In any event, even under the more likely first scenario, the parties would maintain a very high market share in the years to come. This is in itself a strong indicator that the parties, through the operation, will acquire a dominant position in the merchant market for smelter-grade alumina.

Country risk of expansion projects

47. The best theoretical sites for competitive alumina capacity based on attractive bauxite are in Guinea, since the Guinean bauxite is regarded as the best in the world. However, as the example of the only refinery in that country, Friguia-Kimbo, shows, circumstances were such that Pechiney, Alcan and Hydro have pulled out of this venture. The refinery has been taken over by []* and is being restructured with technical assistance from []*. []* got a [%]* ownership in return.
48. Accordingly, industry participants view Australia, Jamaica, India and Brazil as the leading locations for the expansion of alumina production capacity. Of these four countries, Australia offers by far the lowest country-specific risk. Low country-specific risk is reflected in lower interest rates. For instance, on the basis of 10-year US bond interest rates the equivalent interest rate for India is 50% higher. This grants the parties another competitive advantage since their main production site, the Darling Range in Australia, enjoys political stability.

Know-how and technology

49. The market investigation carried out by the Commission has shown that many undertakings are concerned about the impact of the merger as regards refinery technology and know-how (excluding building technology). Both Alcoa and Reynolds own technology to, for instance, increase the yield of alumina. []* Alcoa has a policy of not licensing know-how of this kind to competitors, Reynolds []*.
50. One particular area of concern relates to newly developed technology for impure bauxite. Over the last three years the Worsley joint venture has developed []* new method[s]* for []*. Patents have been applied for. One of these methods has already been tried out successfully in the plant. []*. []*. This technology will increase the output of alumina at Worsley significantly (at least between [%]* and [%]*), on top of other possible []*.
51. The usefulness of this technology []* but can be applied to other places in the world. However, it is particularly effective in the Darling Range because []*. Equipped with this new technology Reynolds would have been in a position to attack Alcoa's dominance. By merging, Alcoa would not only remove this threat but it would also gain access to the new technology, thereby further increasing the cost advantage at the

[]* facilities which would then be controlled []* by Alcoa. It would also increase Alcoa's opportunities for deterring entry. Consequently, access to this new technology will strengthen Alcoa's dominance.

Bidding process

52. The parties claim that there are a significant number of bidders for each of the relatively few opportunities that come up for tender in any given year. According to the parties, recent bids for third-party supply contracts attracted between four and seven bidders, which ensure a competitive outcome. However, the fact that there are between four and seven bidders each time does not mean that those bidders have equal chances of actually winning the contract. If this were the case, then one would expect Alcoa's past market shares to have been between 14% and 25%. Historic evidence demonstrates that Alcoa's market share has always been much higher, and in most years well above 40%.
53. In a standard bidding situation where every bidder has the capacity to supply the whole market the winner is the company with the lowest average cost. The company with the lowest average cost will set its bid just below the closest rival's average cost. In such a situation the take-over of the closest rival will lead to a considerable loss of competition, since in any new bidding round the merged entity will set its price close to the third-best bidder.
54. However, according to Alcoa, what distinguishes the SGA market from that standard bidding model is the fact that suppliers are constrained as to capacity. The market is in balance, and all suppliers can and do sell their production. The parties claim that as a consequence of this market situation the price in any given tender is close to the average cost of the bidder with the highest cost. No low-cost producer would ever forsake his higher profits by submitting a bid close to his nearest rival. The Commission accepts that, in the market scenario described by Alcoa, in each of the three to four tenders that take place each year bidders have to take into account the likely bids submitted by their rivals. In bids involving Darling Range plants (Wagerup and Pinjarra for Alcoa, and Worsley for Reynolds), which produce at approximately the same level of costs, price could be set more competitively. Indeed, in these tenders it is very likely that these firms will set their price at a level lower than that set in situations where only high-cost bidders participate. This is because prior to the merger Reynolds cannot be punished, as it has sufficient capacity to reply Capacity constraints affect the degree of competition in two ways. First, a capacity-constrained firm has little incentive to deviate - a competitor with low extra capacity will not gain much from undercutting its rivals since it will not be able to participate in many other bids - and has no chance to impose a very impressive threat of retaliation against potential deviators. Following the merger, the immediate result of the elimination of one of the most efficient active potential bidders would thus be an increase of the equilibrium price in those bidding rounds where Darling Range plants were closely involved. The final effect would be an increase of the average bidding price.
55. Before the merger Reynolds had []* million tonnes for sale in the merchant market. This tonnage was sold out of []* only ([]*). Therefore, Reynolds had []* tons to participate in new calls for tender (equivalent to [%]* of the merchant market). The parties claim that the influence of Reynolds would be very limited: once this quantity is committed it will not influence future bids. However, it is by no means certain that this is one single opportunity. It is quite likely that Reynolds will succeed only in the second or third or even fourth bid. If this were to be the case Reynolds would thus be

in a position to keep prices down because the winner of those bids had to take Reynolds into account in deciding its bid price.

56. Moreover, Worsley has the chance to expand further by at least 400,000 tons by way of brownfield expansion. This tonnage can be used to submit a bid before the expansion is actually committed. In fact, most if not all expansions are committed before work begins. An illustrative example is Billiton's bid for the supply contract to Alouette in 1997. Billiton offered 430,000 tons out of a brownfield expansion project at Worsley and won the bid against Alcoa at 12.75% CIF. This price is slightly above 12% FOB and therefore below the average market price of 12.5% FOB. According to Billiton it was able to win this over Alcoa's bid only because the expansion took place at Worsley, one of the lowest cost refineries in the world. This example shows that it matters very much whether Darling Range refineries take part in a tender. Therefore, the removal of Reynolds as a competitor will result in higher prices for long term contracts.

Possible long-term suppliers

57. Market participants voiced concern about the reduction of potential long-term suppliers of a sufficient quantity of SGA. For customers of SGA, namely smelters, it is important not to have various sources but rather one single source of alumina. Therefore, according to these views, such long-term suppliers should be capable of supplying at least 500,000 tonnes per year. According to the parties, there will be at least seven producers of SGA with surpluses greater than 500,000t. The parties list Kaiser, Glencore, CVG, Nalco, the Guinean government and the Jamaican government. The results of the market investigation have shown that not all of these suppliers can be truly regarded as reliable long-term suppliers.
58. Kaiser would be the most reliable long-term supplier, apart from the parties, according to most customers. However, there is still some uncertainty as to whether the Gramercy plant will be rebuilt. Glencore is first and foremost a trader but has also been considered a reliable supplier. However, Glencore sources in part from Alcoa and cannot be regarded as entirely independent. With regard to the Indian supplier Nalco it has been reported that Nalco tends to sign medium-term contracts of 3 to 5 years, predominantly to Indian and Chinese smelters. The Jamaican Government can be considered a reliable supplier. However, it too prefers medium-term contracts such as the 3-year contract with Glencore. Moreover, Alcoa has first refusal rights to []* alumina from any possible expansion in []*, which accounts for [%]* of the surplus of []*. In addition, total capacity of []* cannot exceed []* million tons per year unless []*. CVG in Venezuela has very small quantities of alumina and according to the Commission's market investigation most enterprises consider Venezuela "politically risky". The Guinean Government has also been considered by many to be an unreliable long-term supplier because of political instability. Consequently, the proposed merger reduces the number of reliable long-term suppliers for quantities of at least 500,000 tons from 4 to 3. There are other potential long-term suppliers which do not produce surplus alumina but act in the alumina market as traders. These are Billiton and Pechiney. Nevertheless it should not be forgotten that they depend to a large extent on purchases from Alcoa and Reynolds for their trading activities.

Conclusion

59. Taking into consideration all the above factors, the Commission considers that the proposed merger will create a dominant position in the merchant market for smelter grade alumina (SGA).

B. COMMODITY ALUMINA HYDRATE

Product market definition

60. As was explained in paragraph 9, the production of smelter-grade alumina requires four stages; digestion, clarification, precipitation and calcination. The bauxite is combined with a caustic soda solution under high temperature and pressure in a digester. Then in the clarification stage, impurities and residues are separated out by melting and filtering processes and the liquid (called the liquor) is pumped into exchangers and cooled. The alumina is then precipitated from the liquor, as crystals of alumina hydrate, in a process called “seeding”. The liquor is mixed with small quantities of previously precipitated alumina hydrate, and solid alumina hydrate (an intermediate product containing about 40% of chemically-combined water) drops out of the liquor as the liquor cools. The product, aluminium hydroxide, can be removed at this stage or further processed by calcination into alumina. The product removed at this stage is the commodity alumina hydrate.
61. Most of the aluminium hydroxide (90%) is further dried (elimination of the water from the surface of the crystals) and calcined (elimination of the water within the crystals). The alumina resulting from this process is calcined alumina. Ninety per cent of the calcined alumina will be used in the smelting of aluminium metal, which is why it is called metallurgical or smelter-grade alumina (SGA). The remaining 10% of calcined aluminas are used to make alumina oxides for tabular aluminas, aluminate cement and mullite. In these chemical products alumina oxides exhibit product characteristics such as high temperature resistance, chemical resistance, mechanical resistance and electrical resistance.
62. Commodity alumina hydrate, also called commodity hydrate, alumina trihydrate, ATH or aluminium tri-hydroxide, which has not been calcined, is removed as an intermediate product from the SGA production process in a wet, cake-like form, and is known as “wet filter cake” or “wet hydrate”. This is typically dried to make commodity alumina hydrates¹⁷ (namely, a standard product which is not further processed according to individual customers specifications). Commodity alumina hydrate is a chemical grade alumina (CGA) product. The wet and dry commodity alumina hydrates are at this stage a commodity product and they are interchangeable. There is only one small niche segment, namely hydrate for the production of glass, where, for technical reasons, only dry hydrate can be used. Commodity alumina hydrate is sold to customers for use in a number of end-use applications, including as a raw material in the production of various industrial chemicals, such as aluminium sulphate (used in water purification, paper production, and titanium dioxide), aluminium chloride (catalyst in organic chemistry), aluminium fluoride (used in smelters as part of the smelter-bath), cement and for synthetic zeolites (molecular sieves used in petrochemical cracking and in household detergents).

¹⁷ Together, commodity hydrates and calcined alumina not further processed into SGA are also referred to as “non-metallurgical” aluminas.

63. Commodity alumina hydrate is also used as a feedstock for the production of “speciality hydrate”. Speciality hydrates are made in smaller volumes than commodity hydrates and require additional manufacturing steps and expertise. Speciality hydrates are manufactured by further processes such as grinding (mechanical crushing to give a coarse particle size), re-digestion and re-precipitation (dissolving the hydrate in a caustic solution followed by special process-steps and re-precipitation as hydrate) or coating (mixing the ground or precipitated hydrate with other chemicals to give a chemical coating). Speciality hydrates are sold for various end-use applications, which are different from commodity alumina hydrates applications. These include fire retardants and fillers in the plastic industry, filling and coating applications in the paper industry, absorbents and catalysts, and soft polishing applications.
64. The investigation carried out by the Commission has led to the conclusion that commodity alumina hydrate used as a raw material in the production of various industrial chemicals, such as aluminium sulphate, aluminium chloride, aluminium fluoride, cement and for synthetic zeolites forms a distinct product market from other grades and types of aluminas.

Supply-side considerations

65. The supply-side substitutability of commodity alumina hydrate is very low, as there are only few alumina refiners capable of supplying it. Owing to their focus on metallurgical alumina, most refiners do not have the mechanical installation necessary to intercept commodity hydrate between filter and calciner or may produce commodity alumina hydrate containing a high level of residues from bauxite organic compounds which makes it unsuitable for several chemical processes. Even though it is, from a technical point of view, feasible to switch production by simply not further processing hydrate into alumina by way of calcination, this would typically result in substantial logistical problems, as alumina is stored in silos whereas commodity alumina hydrate, due to the high water content, requires special storage and logistical systems. In addition, a dryer would be required in order to produce dry hydrate. The main suppliers of commodity alumina hydrate in the EEA are Alcoa, Reynolds, VAW and Pechiney.
66. The market investigation has shown that a 5% to 10% increase in the price of commodity alumina hydrate would not induce immediate new entry, as it would not justify the opportunity cost and the necessary capital investment. Nor could an increase of capacity by incumbent suppliers be only the result of a small, even non-transitory, price increase, as capacity increments in alumina production are heavy and costly.
67. An increase in the price of commodity alumina hydrate would not be defeated by diverting SGA production to hydrates. First of all, this would mean that smelters would have to run at less than full capacity, and this would cause aluminium producers to incur a significant cost penalty¹⁸. Second, diverting SGA capacity to meet an increased commodity alumina hydrate price would cause back-integrated aluminium producers to forgo sales of primary aluminium, which sells at much higher

¹⁸ It has to be remembered that alumina refineries and smelters normally run at full capacity utilisation.

prices than either type of alumina, and to idle smelting assets in which the fixed costs are substantial. For these reasons even a supra-competitive price for commodity alumina hydrate would not cause diversion of SGA production. The only alternative is to increase the capacity of the alumina refinery, which entails significant investment costs.

68. Thus, in the short and medium term, a price increase in commodity hydrate would be profitable.

Demand-side considerations

69. As was mentioned in paragraph 62, commodity alumina hydrate is used in the production of various industrial chemicals and is sold to manufacturers of these various industrial chemicals as a standard product, which is not further processed according to individual specifications of these manufacturers.
70. However, there are different types of commodity alumina hydrate, corresponding to the differences in particle size, morphology, whiteness, water content, α -alumina content¹⁹ and impurities; but basically it is the same product.
71. Commodity alumina hydrate is used, inter alia, for the production of aluminium sulphate whereby hydrate is mixed in a reactor with sulphuric acid and either poured into drying trays for the production of solid aluminium sulphate or diluted with demineralised water for the production of aluminium sulphate solution. Aluminium sulphate is used by the drinking water industry where low heavy metals content is of utmost importance, and to clarify municipal and industrial water supplies and by the paper industry, where low iron content is vital to ensure whiteness. Owing to environmental legislation the demand for aluminium sulphate has increased during the last 20 years.
72. Aluminium fluoride is based on commodity alumina hydrate feedstock treated with either fluorosilicic acid or fluorspar (HF) in the dry method or liquid HF in the wet method. Aluminium fluoride is utilised mainly as a make-up ingredient in the molten cryolite bath employed in the electrolytic reduction of alumina into aluminium metal in the Hall-Héroult process. The demand for aluminium fluoride has been constantly increasing by 2-4% since 1995.
73. Aluminium chloride is produced from the action of chlorine on molten aluminium metal or the carbonisation of commodity alumina hydrate. Aluminium chloride is used as a catalyst in the organic chemistry, in aviation gas isomerisation, and the manufacture of ethyl chloride, butyl rubber, dye precursors, detergents, polymers etc. as well as in pigment production, wool, processing and paper sizing.
74. Commodity alumina hydrate is also used for the production of zeolite, which is an ingredient of detergents for the detergent industry. In the production process commodity alumina hydrate is dissolved with caustic soda and mixed with liquid silicate. Zeolite crystallises from this mixture after several steps of crystallisation, filtration and drying. During the last 20 years, legislation has restricted the use of

¹⁹ Refers to thermodynamic stability.

phosphates in detergents which has boosted the demand for zeolite as a non-phosphate builder, to almost 1 million tons.

75. Manufacturers of the above products responded to the Commission market investigation that it would not be possible for technical reasons to replace commodity alumina hydrate with any other product for the above production processes.

Conclusions on the product market definition

76. On the basis of the preceding points, the Commission reached the conclusion that there is a separate product market comprising commodity alumina hydrate used in the production of various industrial chemicals.

Geographic market definition

77. Although the geographic market for SGA may be regarded as worldwide, the geographic scope for commodity alumina hydrate is more limited.

78. In comparison to SGA, the handling and logistics of commodity alumina hydrate differ substantially. Customers of commodity hydrate in the chemical and plastics industry require just-in-time deliveries of small lots, which cannot be delivered economically over long distances. Commodity alumina hydrate contains 40% water, which makes it difficult and costly to transport over long distances. Moreover, imports of commodity alumina hydrate into the EEA are subject to a duty of 5.5%, with the exception of those acceding countries which have entered into a European Agreement. However, there is commodity alumina hydrate refining capacity only in Hungary. The only producer, Ajka, which exports small quantities to the Community, is landlocked thereby adding considerable transportation costs if its commodity hydrate were to be transported over long distances. According to the parties, worldwide transport costs add around 15% to the final selling price of commodity alumina hydrate exported from or imported into the EEA. At present, only minor imports have been recorded into the EEA, corresponding to 9.5% of the total EEA consumption. Therefore, the geographic market for commodity alumina hydrate appears not to be wider than the EEA.

79. Commodity alumina hydrates are traded around the world but to a lesser extent than SGA. According to comments from third parties, the North American and European markets are separated by both logistic costs and tariffs, and the market investigation shows that EEA customers mainly purchase their commodity alumina hydrates from EEA production plants. However, until 1997 Alcoa did ship commodity alumina hydrate from []* to the EEA in order to sell to EEA customers. It seems, however, that these imports phased out after Alcoa's acquisition of Inespal's alumina production plant of San Ciprian, in Spain. Since then, Alcoa has sold only commodity hydrate which it produces in its EEA plant. Moreover, Kaiser decided in 1996 to cease commodity alumina hydrate exports to Europe on account of high logistic costs.

80. For the reasons stated above, the geographic market for commodity alumina hydrate appears not to be wider than EEA.

Competitive assessment

81. The Commission has received several complaints coming from the sector using commodity alumina hydrate for the production of various industrial chemicals. The concerns expressed by the complainants are that the merger would in reality create one single supplier of commodity alumina hydrates, who will dictate prices and quantities to be sold. It would not be possible to find an alternative supplier, as the output of other producers is insufficient to meet the manufacturers' demand for commodity alumina hydrate used for the production of various industrial chemicals.
82. The parties' market share for commodity alumina hydrate is [40%-50%]* at a worldwide level and in the EEA [45%-55%]*. The nearest competitor, Pechiney, has a market share of [5%-15%]* at a EEA-wide level, followed by Alusuisse [5%-15%]*, VAW [1%-10%]* and Alcan [1%-10%]*. The market shares world-wide for the nearest competitors are Kaiser [5%-15%]*, Alcan [1%-10%]*, NLM [1%-10%]*, Pechiney [1%-10%]* and Sumitomo [1%-10%]*.

Company	EEA market share	Company	World market share
Alcoa	[%]*	Alcoa	[%]*
Reynolds	[%]*	Reynolds	[%]*
Pechiney	[%]*	Kaiser	[%]*
Alusuisse	[%]*	Alcan	[%]*
VAW	[%]*	NLM	[%]*
Alcan	[%]*	Pechiney	[%]*

83. In the EEA market there are few commodity alumina hydrate suppliers: Alcoa, Reynolds, Pechiney, Alusuisse, VAW and Alcan. Apart from Alcoa and Reynolds, the other commodity alumina hydrate suppliers only have a insignificant part of the total EEA commodity alumina hydrate market, and customers located especially in the Northern Europe have not indicated other suppliers of commodity alumina hydrate than Alcoa, Reynolds, Pechiney, VAW and Alcan. The market for commodity alumina hydrate is becoming more consolidated as a result of the merger of Alcan/Alusuisse²⁰ with a market share of 13%. A majority of respondents to the Commission's market investigation have claimed that it is highly unlikely that suppliers of commodity alumina hydrate located outside EEA would be able to offer the product to customers in the EEA. Suppliers of commodity alumina hydrate in places such as the USA and Japan are too far away to supply commodity alumina hydrate economically to EEA customers. Moreover, suppliers located in Eastern Europe, such as Ajka in Hungary, are constrained by high logistic fees and lack of sufficient storage facilities at the delivery destination. In addition, the quality of Eastern European commodity alumina hydrate is considered by EEA-based customers to be inadequate.

84. The high market share of the merging parties is already indicative of market power in the commodity alumina hydrate market. It has therefore to be examined whether, as a result of the merger, relevant factors other than the high combined market share

²⁰ Comp/M.1663.

confirm that the proposed operation will lead to the creation of a dominant position held by the merging parties in the market for commodity alumina hydrate.

85. In the foregoing product market analysis, consideration was given to whether a price increase in commodity alumina hydrate would be defeated by either the reaction of other suppliers of various aluminas grades or the replacement of commodity alumina hydrate by other products. It was concluded that neither supply nor demand-side substitutability could occur in the short to medium term.
86. The parties have mentioned that Kaisers' Gramercy plant in the USA is likely to recommence its production later this year and would therefore be a potential supplier to the EEA of commodity alumina hydrate. However, respondents to the market investigation have serious doubts as to the date of reopening of Gramercy, and as well to its possibilities of exporting commodity alumina hydrate into the EEA. This doubt seems to be well founded, as Kaiser requested an independent consultant in 1996 to carry out a study to evaluate the economic impact for Kaiser of marketing and selling commodity alumina hydrate in Europe. In the light of the study's conclusions regarding the market survey and the logistic costs, Kaiser decided not to start this project, as there was no strong basis available to build a long-term presence in Europe.
87. It is unlikely, given the market structure of commodity alumina hydrate and the high investment costs for a potential new entrant, that there would be new entry of commodity alumina hydrate suppliers in the EEA. In addition, the duty of 5,5% on imports of commodity alumina hydrate into the EEA and the high logistic costs constitute a barrier to entry. The Commission's market investigation revealed that imports of commodity alumina hydrate from Eastern and Central Europe into the EEA market are highly unlikely. The reasons are the substantial logistic costs linked to the transportation of commodity alumina hydrate, the fact that the Eastern and Central European plants which could potentially be suppliers are facing capacity constraints and finally that a significant number of customers have mentioned that the quality of commodity alumina hydrate from these plants is inadequate.
88. The merged entity's market power is furthermore strengthened by the fact that there is a significant number of rather small customers of commodity alumina hydrate in the downstream market. According to the parties' own information, the biggest customer purchases less than []* tons of commodity alumina hydrate (1999 sales) out of a total EEA commodity alumina hydrate consumption of 1,13 million tons. Other customers purchase a substantially smaller quantity. As mentioned in paragraphs 69 to 75, there are no alternative materials which can replace commodity alumina hydrate in the production of various industrial chemicals. Therefore, customers in the downstream market have no countervailing buying power and will face a monopolistic structure whereby Alcoa/Reynolds would be able to dictate quantities of and prices for commodity alumina hydrates.

Conclusion

89. On the basis of the above, the Commission concludes that the notified operation will result in the creation of a dominant position in the EEA market for commodity alumina hydrate.

C. HIGH-PURITY P0404 ALUMINIUM

Relevant Product Market

90. Primary aluminium is produced at varying levels of purity. It can be divided into three general categories, such as high-purity, standard purity and sub-standard purity metal. The degree of purity of primary aluminium ingots is determined by the level of impurities, mainly silicon and iron, in its total metal content. Primary aluminium containing more than 99.7% of aluminium and less than 0.1% silicon and 0.2% iron is referred to as high-purity aluminium. P0404 high-purity aluminium has a content of less than 0.04% silicon and 0.04% iron impurities, or a content of pure aluminium of approximately 99.92%²¹. Such aluminium is used in aerospace and defence applications.
91. The market investigation has indicated that high-purity P0404 aluminium constitutes a distinct and separate product market from standard aluminium and other grades of high-purity aluminium.
92. From the demand point of view, P0404 is used as a raw material in the manufacturing of high-purity aluminium alloys, where specific mechanical properties (such as lightweight, durability, fracture resistance, etc.) are required. Such alloys are used in the aerospace and aviation industry. Aluminium lithium alloys and other high-purity aluminium alloys (such as 2000 and 7000 series alloys) are principally used in the production of bulkheads, selected engine parts, and external fuel tanks for aircraft and spaceships. The market investigation showed that there is a very high degree of rigidity in the demand for P0404; in fact, owing to its physical characteristics, mechanical properties and price differences, P0404 is not substitutable in its aerospace end uses by any higher or lower purity grade aluminium. On the one hand, higher purity aluminium is more expensive and particularly suitable for higher added value applications, such as electronics, CDs, capacitors, etc. On the other hand, lower purity aluminium contains levels of impurity that makes it unsuitable for aerospace alloys. Buyers of P0404 active in the manufacturing of aerospace alloys stated that they could not possibly switch to any other raw material, be it a metal other than aluminium or high-purity aluminium other than P0404, in the event of a small but significant non transitory increase of 5% to 10% in the price of P0404. From a demand viewpoint, the Commission considers that P0404 has no substitutes in the production of aerospace alloys (aluminium lithium and other alloys) and constitutes a separate and distinct product from other purity grades of aluminium or from other metals.
93. From a supply viewpoint, the merging parties have argued that there is a high degree of supply-side substitutability in the production of aluminium, in general, and that the production of P0404 and other grades of high-purity aluminium is accessible to any aluminium smelter in the world. The market investigation, however, did not confirm this view. In fact, it has shown that smelters producing lower grades of aluminium cannot readily and rapidly shift to producing P0404 in order to become consistent and long-term suppliers of that product. Such a shift could take up to two years for a

²¹ Standard primary aluminium, designated as 99.7% or P1020, contains 0.10% and 0.20% iron and silicon impurities, respectively.

smelter currently producing other grades of high-purity to become a long term and consistent supplier of P0404. Besides the necessary conversions and changes in working practices, in order to achieve a minimum viable scale of production of large quantities of P0404, a constant fine tuning of the production quality will have to be undertaken over a long period of time. The Commission has questioned smelters that are not currently producing P0404 as to their likelihood of entering this market as a result of a small but significant non transitory increase in the price of P0404. None of the smelters replied positively. As a consequence, smelters currently producing standard P1020 aluminium cannot be considered as being part of the market for P0404.

94. Neither would smelters that currently produce high-purity aluminium other than P0404 (whether higher or lower grades of purity) shift to P0404 as a result of a small but significant non transitory increase in the price of P0404. Although such smelters would have the technical capability of producing P0404, they would not have the economic incentive to do so. Aluminium of higher purity than P0404 commands higher margins (premiums) which would have to be abandoned for the sake of a shift of production to P0404. Although the conversion cost *per se* may not be considerable – in the sense that such smelters have the necessary equipment to produce high-purity aluminium (point feeders and computer controls) – the operating costs of the conversion would exceed the revenues, adjusted for actual yield, even with a significant price increase in P0404. According to a CRU report on high-purity aluminium, if a smelter were to decide to try to dedicate some of its production to high-purity, the capital-cost requirement could vary quite considerably depending upon the technology and equipment already employed at the smelter. Further, operating costs at a smelter shifting to P0404 are estimated to rise by approximately 53USD/t. Moreover, even if a smelter had point feeders and computer controls, there would still be additional capital costs, such as 20-50USD/t to install repiping and 15 USD/t in lost production profits while conversion is taking place. Accordingly, on the basis of the additional operating costs and the yield of P0404, conversion to P0404 would be unprofitable, as the additional return from the conversion would be 24-49USD/t – that is, below the extra operating costs of 53USD/t. Thus, although smelters presently producing other purity grades could convert to P0404, they have no economic incentive to do so even if prices increase significantly. Indeed, smelters told CRU that they “have taken a conscious decision not to attempt to produce high-purity aluminium following a cost-benefit analysis.” That is the reason why the market has seen no actual conversions of any smelters to P0404 in recent years. The Commission has questioned smelters currently producing high-purity aluminium (although not necessarily P0404), either in large and consistent quantities, or in limited quantities or as a by-product. They stated that, as a result of a small but significant non transitory increase in the P0404 price, they would not shift their high-purity aluminium production to P0404. Smelters that occasionally produce P0404 as a by-product of more efficient operations (for instance, of P0202 production) said that they would not envisage increasing or streamlining their output of P0404. One of the reasons cited was the relatively small demand for P0404 compared with the disproportionate investment in terms of finance, time, human resources, working methods and the high operating costs. In particular, smelters based in the USA stated that, in the short run, it would also be unworkable to increase any of their P0404 production in the event of a price increase, owing to the current US environmental

regulations that would discourage such an expansion²². Consequently, aluminium of a higher degree of purity is not part of the P0404 market.

95. On the basis of the foregoing, the Commission considers that P0404 aluminium is neither part of the standard aluminium market, nor is it part of the overall high-purity aluminium market. In conclusion, the market for P0404 aluminium constitutes a distinct and separate relevant product market.

Relevant Geographic Market

96. As standard primary aluminium, high-purity aluminium is traded on a world-wide basis. However, because the principal end user of P0404 is the aerospace industry, trade in-flows of P0404 mainly appear to take place in the Community and in North America, where the major manufacturers of aerospace alloys as well as their customer base are located: the geographic market could therefore be narrower than the world. CRU reports that the market for high-purity aluminium (although not necessarily P0404) is typically a regional one, but highly dependent upon the consumption cycles and regional supply and demand. CRU notes that “at times the market becomes inter-regional and sometimes is global in nature”. It goes on to say that consumers of high-purity aluminium will typically prefer to source supplies from a smelter that is reasonably close, in order to save on freight costs. However, depending upon local demand and regional premiums in place at the time, consumers may be forced to source from a supplier outside of their normal operating region. Moreover, in order to limit freight costs, buyers and sellers of high-purity aluminium also swap metal (that is to say, consumers may purchase metal from a seller in Australia, but be delivered metal that was produced at a smelter close to their normal operating region in the US or in the Community). Nevertheless, although there is a desire amongst operators to limit long-distance transportation, trade flows around the world were borne out by the market investigation. Consequently, the Commission considers that there is a world-wide geographic market for P0404 aluminium.

Competitive Assessment

97. The Commission’s investigation has taken into account a complaint lodged by McCook Metals L.L.C. (hereinafter “McCook”). McCook is a former Reynolds plant located in McCook, Illinois, that was sold by Reynolds in 1998. Currently, McCook is active in the production of aluminium alloys used in the aerospace industry. To this end, McCook purchases P0404 which it uses to make aluminium lithium alloys. In the aerospace alloys market, which is a downstream market, McCook is competing against Alcoa and to a lesser extent, Century Aluminium (recently acquired by Pechiney). Prior to the merger, McCook had sourced its P0404 supplies from Reynolds. As a result of the merger, McCook claims that the merged firm will have both the ability and the incentive to restrict output and increase prices of P0404 to McCook, thus limiting, if not foreclosing, McCook’s ability to compete against Alcoa for the sale of aluminium lithium plate and other high-purity alloys to the aerospace and defence industry.

²² It has to be noted that due to the different production process used in the production of P0404, the likelihood of environmental hazards is increased (e.g., gaseous emissions are too high, etc.).

98. The operation will result in a vertical integration in so far as Alcoa will acquire Reynolds - that is, McCook's supplier of P0404 - while being itself active in the downstream market for aerospace aluminium lithium alloys. As a consequence, it should be assessed whether adverse competitive effects may arise from the operation. In particular, there are two questions which are relevant to the assessment of the proposed operation as regards the markets for P0404 and its vertically related market for aerospace aluminium lithium alloys. First, it should be considered whether by virtue of the market power held in the upstream market of P0404, the merged firm would be in a position to acquire or strengthen a dominant position in the supply of P0404. Second, it should be considered whether by virtue of its position in the downstream market for aerospace aluminium lithium alloys, the merged firm would be in a position to foreclose a substantial part of the market to competing independent suppliers of aerospace aluminium lithium alloys, such as McCook.
99. Although both the merging parties and McCook are U.S. undertakings and their production activities in relation to P0404 and to aluminium lithium aerospace alloys are carried out in the U.S., the effects of the merger on the P0404 market, and subsequently on the production and supply of aluminium lithium and other aerospace alloys, fall under the Commission's reviewing and enforcement jurisdiction on mergers. Both P0404 and the aerospace alloys are world-wide markets, of which the Community is an integral part. From the point of view of the effects of the merger on Community territory, it has to be noted that several Ministries of Defence of Member States as well as individual aerospace industries, consortia and programmes in the EU (Airbus and its partners, Fokker Aerostrukturs, Eurofighter, the European Space Agency and its Ariane V programme, SONACA, etc.) have supply contracts with McCook or Alcoa in relation to aerospace alloys made of P0404. As will be shown below, owing to the fact that the operation will give rise to dominance, the effects of the proposed concentration on the end users and consumers in the Community would be substantial, foreseeable and direct.

Actual competition in the P0404 market

100. The investigation has concluded that it is difficult to calculate the shares of either capacity or production of P0404. The main aluminium analysts (CRU, James F. King) calculate market shares on the basis of standard aluminium smelting capacity and can also give estimates of the production capacity of overall high-purity aluminium (all levels of purity). Nevertheless, no figures whatsoever are available for each degree of purity, including P0404. It therefore becomes necessary to use proxies in order to assess the significance of the market positions of the merging parties in the production and supply of P0404.
101. In practice, few firms in the world sell P0404 in large quantities and on a consistent basis to manufacturers of aerospace aluminium lithium alloys. On the basis of historical data, only two firms have supplied P0404 to such manufacturers, Reynolds and Southwire, both located in the US. These two producers are the only ones that responded to tenders for P0404 launched by McCook in August and October 1999. Using as a proxy the bidding pattern of McCook's tenders, Reynolds will have approximately 50% of the P0404 market, since the only other firm that was willing to commit itself to a long term P0404 supply contract was Southwire.
102. The notifying parties, however, have identified eight firms, in addition to Reynolds, that could sell P0404 to third parties: Southwire (US), Ormet (US),

Noranda (US), Dubal (Dubai), Comalco (Australia), Pechiney (France), Asahan (Indonesia) and Kaiser, through its 90% ownership in Valco (a smelter located in Ghana, Africa). The Commission cannot consider all of these companies as being actual, reliable and long term suppliers of P0404, for the reasons outlined in the following paragraphs.

103. As was mentioned in paragraph 101, McCook launched two world-wide invitations to tender (hereinafter the “McCook solicitations”) for a long term supply contract for P0404. Only Reynolds and Southwire were able to give a quotation for a long-term P0404 supply agreement. All other firms queried were unable or unwilling to supply McCook’s needs. For example, Alcan said it would not be in a position to supply P0404 as it consumes its production internally. Alouette (a joint venture between Hoogovens and VAW) also answered that its production is used captively. Bharat Aluminium (owned by the government of India) responded that the U.S., where McCook is located, was out of its export range. Billiton said that it produces very little P0404 and this is committed elsewhere. Comalco responded that it was unable to commit itself to a long-term supply agreement although it could make spot sales of P0404. Dubal responded negatively because of capacity constraints and product mix. Glencore, a metals trader, did not provide a quotation and neither did other traders such as Barclays Capital, Sumitomo or Novarco. Kaiser said that its P0404 is produced by Valco in Ghana, whose output was preferably shipped to the Community (under a preferential import regime). Noranda expressed interest only in spot sales of P0404. Ormet did not give any quotation. Pechiney World Trade USA said it would not be producing any P0404 during the coming years. Tomago, through its Gore Aluminium joint venture, and VAW said that they did not produce P0404. The parties contested the credibility of the solicitation and of its results. They argued that McCook’s solicitation took place after McCook and Reynolds had signed a new P0404 supply agreement and, as a result, none of the solicited suppliers approached would have taken McCook’s solicitation seriously. The Commission does not agree with the parties. First, the parties assume that the suppliers approached were aware of the individual supply contract between Reynolds and McCook. However, no such evidence was ever brought to the Commission’s attention, either by the notifying party or through its market investigation. Second, even assuming that solicited suppliers may have had knowledge of the contract between McCook and Reynolds, they could not possibly know whether this contract covered all of McCook’s requirements or whether McCook’s solicitation was for additional quantities of material. This is actually corroborated by the fact that most of these suppliers did reply to McCook’s solicitation either with a refusal/statement of inability to supply or with a specific proposal. Third, the duration of the McCook-Reynolds contract was limited to two years and the prospect of becoming McCook’s supplier after that period would have encouraged even those solicited suppliers which might have known about the said contract to give McCook a quotation for P0404. For these reasons, the Commission considers that the said McCook solicitation can constitute a factual element that has to be taken into account in the assessment of the concentration in relation to the high-purity P0404 aluminium market.

104. Indeed, throughout its investigation, the Commission confirmed most of the above citations, although some of the actual suppliers of P0404 (Southwire and Noranda) did not respond to its requests for information.²³
105. The market investigation, in fact, established that the few actual producers of P0404 are not capable of producing and supplying P0404 on a long term basis. The Russian smelters and the Indonesian producer Asahan have neither the incentive nor the technical abilities to produce P0404 on a consistent basis. Alouette, besides the fact that it produces high-purity aluminium for its internal consumption, does not produce aluminium of the purity of P0404. Ormet stated that it sells P0404 on an “as available” basis, thus showing unwillingness to commit itself to the long-term production of P0404. Furthermore, Ormet has no intention to expand its current P0404 production and, as third parties claim, it has contractual relationships with Alcoa. Valco can produce high-purity aluminium up to the levels of P0610. Billiton produces only small quantities which are already committed elsewhere.
106. Dubal has the largest capacity for the production of high-purity aluminium, but produces other value-added, high-purity products. In fact, Dubal produces P0202 used by the Japanese electronics industry (CDs, capacitors, etc.), but not P0404. Alcan and Pechiney produce P0404 which is consumed internally and they are not in a position to commit themselves to further long-term production of P0404. Corus does not produce high-purity aluminium of the level of P0404.
107. Overall, of all the firms identified by the parties as being capable of producing P0404 currently, whether in small quantities or as a by-product, none of them indicated that they would be able to produce it and sell it in sufficient quantities and with enough reliability to make them a long-term supplier.
108. Southwire is the only producer currently able to produce and supply P0404. Southwire gets its high-purity alumina supplies from Kaiser’s Gramercy refinery in the US. However, after the explosion of Gramercy, Southwire is facing feedstock difficulties and will have to find alternative suppliers of high-purity alumina and possibly become dependent on Alcoa for its alumina requirements.
109. The parties stated that they have, themselves, been supplied in P0404 by other smelters in the past, notably by the eight companies referred to in the preceding paragraphs. Reynolds, in particular, has purchased spot quantities of P0404 precisely to supply McCook in times of temporary shortage. The parties argue, therefore, that their merger will not lead to a dominant position and that McCook will not be foreclosed as a result of the merger, since the same companies may cover his supply requirements.
110. The Commission does not consider the spot purchases made by the merging parties as being substitutable for a long-term supply relationship from the point of view of a manufacturer of aluminium alloys competing in the bidding markets for aerospace applications. The merging parties have purchased small amounts of P0404 on an irregular basis for any of the following reasons: to offset temporary imbalances

²³ These companies have no affiliates or other assets in the Community territory and the Commission could not enforce Article 11(5) of the Merger Regulation, which places firms under a legal obligation to answer formal requests for information, because of lack of jurisdiction

between their own production of P0404 and their internal needs and contractual commitments; to make a trading profit; or for freight savings.²⁴ On the contrary, a company competing in the downstream markets of aerospace alloys cannot possibly afford to pay higher spot prices or to be supplied in small and fragmented quantities of P0404 on an irregular basis. For instance, even differences in quality stemming from spot purchases from various smelters, as well as the associated uncertainty of supplies, could damage its position as a sub-contractor on aerospace contracts.

111. The Commission does not consider smelters producing small quantities of P0404 as a by-product of standard aluminium production to be actual competitors in P0404 market. Such smelters could not guarantee any steady and long-term supplies of sufficient P0404 quantities without engaging significant investments. Such smelters could not produce large amounts of P0404 on a consistent basis. This is so because by-products are generally produced in fixed proportion to all primary aluminium produced at a smelter. The amount of P0404 produced as a by-product can only be increased if the production of the other grades of aluminium for which it is a by-product will be also increased. Even a price increase in P0404 would not warrant increasing all aluminium production at such smelters, because P0404 would be too small a proportion of the aluminium produced in these smelters (generally less than 5%). Because the demand for all grades of aluminium is not the same, it would not be economically feasible to increase the production of other grades of aluminium in order to produce more P0404.
112. The most likely competitive response, should the merged firm increase its prices or refuse to sell to McCook, would come from Southwire. Southwire was the only bidder, apart from Reynolds, to McCook solicitations for a long-term supply contract of P0404. However, in the event of a supra-competitive price increase or a refusal by the merged firm to supply McCook, Southwire would be likely to raise its prices to supra competitive levels as well, in the absence of alternative competitive suppliers. In addition, Southwire's incentives for entering into a long-term supply agreement with McCook may be questionable. As Alcoa is currently the major supplier of Southwire's alumina, Southwire may not wish to disturb its supply relationship with Alcoa by supplying P0404 to McCook, a competitor of Alcoa in aerospace alloys.
113. On the basis of the foregoing, Reynolds and Southwire are the only actual competitors able to produce and supply large and consistent quantities of P0404 under long term contracts.

Potential Competition and Barriers to Entry

114. The parties have argued that many aluminium producers could be viewed as potential suppliers of P0404 in the event of a supra competitive increase in price. However, the market investigation has shown that entry barriers make entry into the P0404 market very unlikely. This applies both to smelters that currently produce aluminium of other degrees of purity (or small quantities of P0404) and to smelters that currently do not produce P0404 or any other high-purity aluminium.

²⁴ For example, a smelter may get an order from a customer located near it. Since the smelter pays the freight it would have an incentive to use its P0404 for that customer and purchase P0404 produced at a smelter located closer to another customer. Reynolds has thus supplied McCook with P0404 produced at a Southwire smelter in Kentucky.

115. The Commission has assessed, in particular, the entry prospects of smelters that either produce P0404 for their internal needs or smelters that produce other high-purity grades. As a result of its assessment, the Commission considers that none of these smelters would consider producing and supplying large and consistent amounts of P0404 to third parties. In particular, Dubal indicated to the Commission that it would possibly consider switching to P0404 production and expand third party sales of P0404 in response to a price increase of 6% to 7%. Billiton, which does not presently produce P0404, has indicated that it could easily produce and sell P0404 with no additional investment. However, Billiton suggested that it would switch only a small portion of its aluminium production to producing P0404 if prices for that product increased by well above 5%. Ormet, a by-product supplier of small quantities in the spot market, said that it would not consider expanding any third party sales of P0404, no matter the relative price increase. Kaiser, through its Valco (Ghana) smelter, said that prices would have to rise sufficiently high to compensate for the preferential trade regime it enjoys when exporting P0404 to the Community (Generalised System of Preferences). In such a case, the relative price increase would have to be close to 9%. Finally, Alcan has indicated to the Commission that it produces P0404, though it does not currently sell any quantities to third parties. Alcan suggested that an increase of approximately 1.3% in the P0404 price would induce it to begin producing P0404 for sales to third parties. This is because Alcan is bringing on a new smelter in Alma, Quebec where it may have high-purity metal available in quantity in 2001.
116. The Commission does not consider the above aluminium producers as constituting a credible potential threat to the merged firm's market position in P0404. With the exception of Alcan, the remaining players would possibly consider starting to produce and supply P0404 only in the event of a price increase above 5%. In a commodity market such as P0404 aluminium, where two major suppliers may be influencing market prices by their output decisions, a price increase above 5% could already be considered as supra-competitive. In addition, the proposed concentration raises vertical issues stemming from the merged firm's activities in the upstream P0404 market and the downstream aerospace aluminium alloys market. In this case, the prospects of potential competitors stepping into the P0404 market in the event of a supra competitive price increase will not have the effect of sanctioning the merged firm's pricing or output decisions. Unlike to a classical horizontal overlap case, the parties would not fear losing McCook as a customer in the event of defeated supra competitive price increase or refusal to sell. On the contrary, they would rather prefer McCook to either pay higher prices to potential competitors or to suffer a lack in P0404 supplies. In both cases, this would have the effect of making McCook less competitive in the downstream aerospace alloys market. Lastly, the market price that will prevail after the merger will be at supra competitive levels compared to that before to the merger.
117. Alcan would only require an increase in price of 1.3% to consider producing P0404 for third party sales. The Commission, however, does not consider Alcan as a genuine potential entrant. In fact, Alcan's plans to integrate vertically in the downstream aerospace alloys market will try to earn market share to incumbents such as Alcoa and McCook. It is, therefore, highly unlikely that Alcan will commit to supply McCook under long term contracts.

118. The other category of smelters that would have to be considered as potential competitors are those producing only standard-purity aluminium. Such smelters cannot readily start producing P0404 in large and consistent quantities. In terms of economic incentives, the price of P0404 would have to rise well above 10% in order to recoup the investment required to commit a smelter to the production of P0404. This is so because even a modern smelter would initially obtain a 40-75% yield of high-purity aluminium in the first year of conversion. As mentioned in the preceding paragraphs, the P0404 premium that a potential entrant would obtain would not offset the minimum operating cost of production of P0404. In addition to the operating cost constraint, the commitment in terms of working discipline and training of personnel may act as a disincentive. On this point, the parties have argued that all it takes to convert a smelter to the production of P0404 is some fine-tuning in the production process (such as removing the cathodes from the pot earlier so that their iron pins do not come in contact with the bath, not throwing floor sweepings into the pot as is the case for standard aluminium production, and other similar measures). Nevertheless, aluminium producers who have replied to the Commission's questionnaires have stated that the investment is heavier, both in financial terms and in new working practices. For instance, the intangible investment in re-training personnel and in re-organising working methods and practices was considered by most of the potential suppliers as the highest barrier or disincentive to entry.
119. Alcoa has conducted a natural experiment in its Eastalco smelter in Maryland, in the United States. Although this smelter had not produced P0404 in recent years, it was able to convert three pots from standard aluminium to P0404 within two months. The parties have therefore pointed to this example as being representative of the ease and speed of the conversion of a smelter to P0404 production. However, the Commission cannot consider the Eastalco example to be representative of business reality. First, the specific smelter used to be active in the production of P0404 over the past years. This has facilitated the conversion significantly, as the relevant equipment, working methods and, most importantly, experience were already available to that smelter. Secondly, overall, the smelter produced P0404 only in three of the more than one hundred smelting pots that it has. It would take much longer than two months for a smelter, let alone one that has never produced P0404 in the past, to produce more substantial quantities than those corresponding to the three converted smelting pots. Thirdly, the fact that a smelter produces a small amount of P0404 in a limited number of pots is not equivalent to becoming a long-term supplier of large quantities of P0404. As was explained in the preceding paragraphs, a small or experimental scale of production aimed at the spot market cannot be considered a reliable source of supply by buyers such as those active in the downstream aerospace markets.
120. On the basis of the foregoing, the Commission considers that the prospects of potential competition in the P0404 market are low and cannot constrain the market power which the merged firm will acquire in this market.

Excess Production Capacity

121. The prospects for new entry into the P0404 market may be deterred by the merging parties through their excess capacity. CRU estimated the excess capacity for all grades of aluminium held by world-wide firms capable of producing high-purity aluminium (all grades of purity). The merged firm will have 44.6% of that capacity, with Alcan having 17.1%, Asahan 11.3% and Kaiser 10.8%. The remaining firms

have between 0.1% and 4.5% excess capacity. The disproportionately small amount of excess capacity held by the competitors of the merged firm reflects their relative inability to increase output as a result of a supra-competitive price increase in P0404. It also supports the view that the parties may use this excess capacity as a strategic barrier to entry, namely by credibly threatening to increase output in order to make entry unprofitable.

Other Barriers to Entry

122. The merged firm may use its control over alumina supply as a barrier to entry or in order to discourage smelters from competing in the P0404 market. The analysis of the SGA market has concluded that the merged firm will become a dominant producer and supplier of alumina sold to third parties. As alumina is the key input to a smelter, the control of this input may act as a disincentive for a producer considering entry into the P0404 market. The example of Dubal is characteristic in this respect. Dubal is 90% dependent on Alcoa for its alumina requirements. It stated that if the price of P0404 increased above 12% it would consider shifting production to P0404, but would prefer to use Alcoa as its trading arm if it were to sell it to the U.S. This statement probably reflects Dubal's reluctance to supply with P0404 a competitor of Alcoa in the aerospace alloys markets.
123. The parties have also suggested that a purchaser of P0404 may, instead of buying P0404, blend quantities of higher and lower purity aluminium (for instance, P0303 and P1020) in order to eventually obtain P0404. Although this is technically feasible, the Commission does not regard it as an economically viable alternative. Such a blending would result in a cost penalty for the blender, as the latter would have to blend disproportionately more P0303 than P1020 to reach the level of purity of P0404 (16 parts of P0303 for one part of P1020).²⁵ This will have a cost incidence in the order of 2% to 3%. In addition, blending metals of different purity increases the blender's logistical costs (additional transportation, handling and storage costs) as well as operating costs (more energy and labour to re-melt and blend the metal). Finally, and most importantly, blending may reduce the competitiveness of a manufacturer of aerospace aluminium alloys as a reliable supplier. This is due to the fact that an aerospace alloys manufacturer will have recourse to different fragmented sources of raw materials, which may complicate accreditation and qualification with aerospace customers. As a consequence, the fact that aluminium rolling mills producing standard downstream products (such as beverage can stock or lithographic sheet) may have recourse to blending is not relevant for a manufacturer of aerospace alloys. The degree of reliability as to the origin and quality of the raw materials used in aircraft does not make blending an available option.

Creation of a dominant position in the P0404 market

124. On the basis of the above analysis, the Commission considers that the proposed concentration has the effect of changing the output incentives of one of only two

²⁵ As P1020 contains more silicone than iron, if P0303 and P1020 are mixed so that the mixture contains less than 0.04% silicone, the mixture would contain less than 0.04% iron. The ratio of P0303 to P1020 needed to obtain at least P0404 can be obtained from the following formula: assume 1 pound of P1020 and x pounds of P0303 are purchased. 0.04% silicone is obtained when x solves the following equation: $[0.04 = (0.2 * 1 + 0.03 * x) / (1 + x)]^*$. $x = 16$ solves this equation.

active actual P0404 suppliers, namely Reynolds. As a result of the merger, the merged firm may act independently of its competitor, Southwire, or its customer, McCook, by increasing the P0404 prices or refusing to sell. In each case, the P0404 price will increase at supra competitive levels. In the event that the merged firm raises the prices of P0404, Southwire (which is dependent on the merged firm for its alumina supplies) will not compete aggressively against the merged firm on the price, but is more likely to follow the price increase. In the event that the merged firm refuses to sell, Southwire will be able to charge supra-competitive prices. Therefore, whether or not present in the market, the merged firm will be able to control the supply conditions of P0404. The Commission therefore considers that the concentration creates a dominant position held by the merging parties, as a result of which effective competition would be significantly impeded in this market.

Vertical effects in the market for aerospace aluminium alloys

125. The dominant position created in the P0404 market becomes meaningful in the light of the fact that in the downstream aerospace aluminium alloys market, Alcoa is competing against McCook. Alcoa and McCook are the sub-contractors of the U.S. Department of Defence, as well as the main suppliers of aerospace alloys to aerospace manufacturers. As a result of the merger, vertical integration will help Alcoa-Reynolds to raise McCook's costs or drive it out of the aerospace aluminium alloys market and extract monopoly rents in the downstream aerospace alloys.
126. The aerospace alloys market is a bidding market. Bids are organised either for government or for private contracts. In the past, McCook has been a successful bidder thanks to the reliability and the competitive price of its P0404 supplies from Reynolds. After the merger, the merged firm will be able to raise McCook's input costs and, therefore, its prices for aerospace alloys. This will ultimately result in an overall increase of prices for aerospace alloys. Even assuming that McCook's added value in processing P0404 into aerospace alloys is so large that McCook could accept a supra-competitive price of P0404 and still remain competitive in the bidding process, buyers of aerospace alloys would pay higher prices. Alternatively, if the merged entity decides not to supply McCook with P0404, the latter may quit the aerospace alloys market, in which case the merged firm will remain the only supplier in the downstream market of aluminium alloys and will be able to charge monopoly prices. In that case, again, buyers of aerospace alloys would be worse off as they would have to pay higher (monopoly) prices.
127. The parties may argue that should they exclude McCook from the downstream aerospace alloys market, new entry will be induced in that market, motivated by higher or monopoly prices of aerospace alloys. However, higher aerospace alloys prices are not likely to induce new entry into this market, mainly because of the significant barriers to entry. The most significant barrier to potential entrants will be the limited availability of P0404 supplies, as a result of the creation of a dominant position in the P0404 market. Even assuming that potential entrants may be aluminium producers, which may undertake to integrate backwards and produce their own P0404, there are major technological barriers in the aerospace alloys market that would make their entry look unlikely. Quite characteristically, even Alcoa, an established producer of aerospace alloys had to receive technical assistance from aircraft manufacturers such as Lockheed Martin, in order to overcome technical difficulties. Other potential entrants, lacking Alcoa's resources and experience, would

need substantially more assistance to establish themselves in the aerospace alloys market.

128. Overall, through its dominant position in the P0404 market, the merged firm may either restrict P0404 supplies, or raise its competitors' costs and prices in the downstream aerospace alloys markets. In either case, the merged firm will be able to foreclose its competitors in the downstream market and become the main supplier of aerospace alloys. Vertical integration leading to foreclosure will benefit the integrated merged firm, whilst damaging the non-integrated McCook. Although production efficiency may be maintained, consumers' surplus and welfare will be impaired.

Conclusion

129. On the basis of the foregoing analysis, the Commission considers that the proposed concentration will result in the creation of a dominant position held by the parties in the market for PO404. Furthermore, the elimination of Reynolds from the P0404 market and the rise of Southwire as a dominant supplier will result in the foreclosure of competitors, such as McCook, in the downstream market for aerospace alloys.

IV. COMMITMENTS PROPOSED BY THE NOTIFYING PARTY

130. On 20 and 29 March 2000, the notifying party offered certain commitments to remove the competition concerns identified by the Commission in its Statement of Objections of 9 March 2000. Following discussions with Commission's officials subsequent to their market test, the undertakings were improved and communicated to the Commission on 12 April 2000. Such commitments serve in an obvious and clear-cut way to solve the competition problems without the need for a further market test. Consequently, the consultation of Member States' has taken place in a very short time. In such a situation the Commission considers that the notifying parties have complied with their obligations under Article 18(2) of Commission Regulation 447/98²⁶. They are assessed here below, in the order followed above in the assessment part of this decision. The proposed undertakings are attached to this decision and form an integral part of it.

A. Smelter Grade Alumina

131. Within a period of [...] from the date of this Decision Alcoa proposes to divest Reynold's 56% stake in the Australian Darling Range refinery "Worsley". Within a period of [...] from the date of this Decision Alcoa proposes to divest Reynolds 50% stake in the refinery of Stade, in Germany. If the Commission has not approved a suitable buyer within these two time periods, Alcoa shall give an irrevocable mandate to the Trustee to effect the divestiture within an additional time period of [...]. Worsley is currently being expanded to [...] million tons of production capacity, which gives Reynolds an off-take right over [...] million tons of SGA. The 50% stake in the Stade refinery represents another [...] tons of SGA production. Therefore, the proposed divestiture amounts to [...] million tons of SGA. Reynolds' SGA for sale in the merchant market amounts to [...] million tons in 2000.

²⁶ OJ L61, 2.3.1998, p. 1

Assesment

132. The proposed undertakings, by eliminating in particular the overlap at the level of the lowest-cost alumina refineries, are clearly sufficient to remedy the competition concerns as regards the SGA merchant market. The capacity divested is considerably more than the current tonnage of SGA sold by Reynolds to the merchant market. By disposing of Reynolds' stake in Worsley, Alcoa is selling off a refinery which enjoys one of the lowest operating costs in the world, has very good expansion opportunities of at least a further 400,000 tons, if not 900,000 tons, and is located in a geographic area with a very low country risk. In sum, the two undertakings proposed are capable of restoring the level of competition that existed before the merger.

B. Commodity Hydrate

133. In order to eliminate the Commission's competition concerns, the notifying parties submitted on 3 March 2000 a formal undertaking regarding the divestiture of Reynolds' interest (50% stake) in Aluminium Oxid Stade GmbH. The other owner of this plant is the German enterprise VAW, which has a right of first refusal over Reynolds' Stade interests.

134. Alcoa will assign Reynolds' Stade Interests, together with a toll-manufacturing agreement with the Stade refinery to Newco, a company formed to hold those Interests. Alcoa will divest its 55% shareholding in Newco to an independent third party approved by the Commission, and Alcoa will also divest to that third party Reynolds' European commodity alumina hydrate business, including all customer lists and contracts, and all rights to conduct such business in its present state. The third-party purchaser will have the right to toll process sufficient bauxite at Stade to produce around [...] tons of commodity alumina hydrate annually.

135. Moreover, Alcoa has undertaken to enter into bauxite supply contracts with the acquirers of Reynolds' Stade interests. The bauxite supply contract will cover all bauxite required by the acquirers for toll conversion through the Stade refinery on the same price terms as Alcoa's existing contract with *Companie de Bauxite de Guinée*, thereby giving those buyers access to bauxite at an identical price to that presently available to Reynolds for the Stade refinery, without the need to enter into a "take or pay" obligation.

136. The undertakings removes the identified competitive overlaps and address the concerns expressed by third parties during the Commission's investigation of the case.

C. High-purity P0404 Aluminium

137. Alcoa will sell to a purchaser to be approved by the Commission a 25% undivided interest in the assets of the Longview, Washington, smelter. Following the divestiture, Alcoa and the purchaser will operate Longview as a cost-sharing, production-sharing unincorporated joint venture with each venturer separately and independently marketing its share of the aluminium output. Alcoa will also grant the purchaser preferential rights to take P0404 aluminium as its share of Longview aluminium production. Finally, Alcoa will assign to the purchaser Reynolds' contractual

obligations to McCook Metals LLC for the supply of P1020/A7E, P1015A, P0610A, P0506A and P0404B unalloyed aluminium ingot.

Assessment

138. The Longview smelter is the P0404 smelter of Reynolds'. It presently makes the large majority of Reynolds' P0404 production for McCook. This undertaking may be considered sufficient to remove the competition problem identified in the high-purity P0404 aluminium market. The divested equity stake is equivalent to around [...]* tons (out of a total 1999 production of [...]* tons). This volume is larger than McCook's current annual P0404 demand of [...]* tons. It is also larger than the [...]* tons that the current McCook's contract with Reynolds allows it to buy as a maximum volume. By conferring to the purchaser the right to around [...]* tons of aluminium, it is expected that competition conditions at the level of the P0404 market will be maintained as they were before the merger. In addition, competition in the downstream aerospace alloys market will not be foreclosed, as the large amount of the divested capacity is capable of responding to a potential growth in demand downstream. On this basis, the Commission considers that the proposed undertaking is sufficient to remove the competition problems identified in the Statement of Objections of 9 March 2000.

Conclusion on the proposed commitments

139. Overall, the undertakings submitted by the parties are considered adequate to solve all the competition concerns identified by the Commission in its Statement of Objections of 9 March 2000.

HAS ADOPTED THIS DECISION

Article 1

The concentration by which Alcoa Inc. acquires, within the meaning of Article 3(1)(b) of Regulation (EEC) No 4064/89, control of the undertaking Reynolds Metals Company is declared compatible with the common market and the functioning of the EEA Agreement.

Article 2

This authorisation is subject to full compliance by Alcoa Inc. with the commitments described in paragraphs 130 to 138 and formally set out in the undertaking annexed hereto.

Article 3

This decision is addressed to:

Alcoa Inc.

201 Isabella Street
Pittsburgh, PA 15212, USA
Mr. Kurt R. Waldo, Esq.
Assistant General Counsel

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Done in Brussels, 03.05.2000

For the Commission
Signed by Mario MONTI
Member of the Commission

ANNEX

UNDERTAKING

CASE NO. COMP/M.1693 – ALCOA INC./REYNOLDS METALS COMPANY

1. Whereas, on November 15, 1999, Alcoa Inc. (“Alcoa”) notified the proposed merger between Alcoa and the Reynolds Metals Company (“Reynolds”) (the “Transaction”) to the European Commission (the “Commission”) pursuant to Council Regulation 4064/89 (the “Merger Regulation”);
 2. Whereas, Alcoa wishes to submit commitments pursuant to Article 8(2) of the Merger Regulation to form the basis for a decision pursuant to Article 8(2);
 3. Therefore, Alcoa offers the following commitments to allow the Commission to approve the Transaction pursuant to Article 8(2) of the Merger Regulation.
 4. This Undertaking shall take effect upon the date of the Commission Decision declaring the notified concentration compatible with the Common Market under Article 8(2) of Council Regulation No. 4064/89 as amended (the “Effective Date”).
- A. DIVESTITURE OF REYNOLDS’ INTEREST IN THE WORSLEY JOINT VENTURE**
5. Within [...] from the Effective Date, unless extended by the Commission in accordance with paragraph 27 of this Undertaking, Alcoa shall sell, or cause to be sold, to a purchaser to be approved by the Commission, all of the interest held by Reynolds (“Reynolds’ Worsley Interest”) in the Worsley Joint Venture, established by agreement dated February 7, 1980, and subsequently amended (the “Worsley Joint Venture”), to the effect that, following the divestiture, Alcoa will hold no equity interest, either directly or indirectly, in the Worsley Joint Venture. Alcoa will assign to the purchaser of Reynolds’ Worsley Interest all of Reynolds’ smelter-grade alumina contracts supplied from the Worsley refinery.
 6. To assist the Commission in determining whether any proposed purchaser of the Reynolds’ Worsley Interest is suitable, Alcoa shall submit a fully documented and reasoned proposal enabling the Commission to verify that: (i) it does not own a material direct or indirect interest in the proposed purchaser; (ii) the sale allows the Worsley Joint Venture to continue to operate as an active competitive force; and (iii) at the time of completion of the purchase, the proposed purchaser has, or can reasonably be expected to obtain, all necessary approvals for the purchase from the relevant competition authorities.
 7. If the Commission has not approved a proposed purchaser of the Reynolds’ Worsley Interest within [...] from the Effective Date, Alcoa shall give an irrevocable mandate to the Trustee to effect the divestiture within an additional period of [...] at no minimum price.

B. DIVESTITURE OF REYNOLDS' INTEREST IN THE STADE REFINERY

8. Within [...] from the Effective Date, unless extended by the Commission in accordance with paragraph 27 of this Undertaking, Alcoa shall sell, or cause to be sold, to a purchaser to be approved by the Commission all of Reynolds' European chemical-grade alumina ("CGA") business, including all customer lists and contracts, and 55% of the shares of a holding company that, in accordance with the procedure set out in paragraph 5 below, will own Reynolds' 50% interests in Aluminium Oxid Stade GmbH and Aluminium Oxid Gemeinschaft Stade ("Reynolds' Stade Interests"). In a separate transaction, Alcoa shall also sell the remaining 45% of the shares of the holding company to a viable and independent third party purchaser.
9. The sale of Reynolds' Stade Interests shall be conducted in accordance with the following procedure.
 - (a) Alcoa will transfer to a new corporate entity ("Newco") all of Reynolds' Stade Interests, and shall assign to Newco the benefit of the tolling agreement between Reynolds Aluminium Deutschland Inc. and Aluminium Oxid Stade GmbH.
 - (b) Alcoa will sell to a purchaser to be approved by the Commission 55% of the shares in Newco, together with the right to have [...] MT of CGA toll-manufactured annually by the Stade refinery.
 - (c) Alcoa will sell to a purchaser to be approved by the Commission the remaining 45% of the shares in Newco, together with the right to have [...] MT of SGA toll-manufactured annually by the Stade refinery.
10. Contemporaneous with the sale of the 55% and 45% interests in Newco, Alcoa will offer the purchaser, or purchasers, a long-term supply contract for bauxite mined at the Boké mine in Guinea in sufficient quantity to satisfy the purchaser's requirements for tolling bauxite through Stade ("Bauxite Supply Contract") on terms no less favourable than those available to Alcoa from Compagnie de Bauxite de Guinée.
11. To assist the Commission in determining whether any proposed purchaser is suitable, Alcoa shall submit a fully documented and reasoned proposal enabling the Commission to verify that: (i) it does not own a material direct or indirect interest in the purchaser; (ii) the sale allows the Stade refinery to continue to operate as an active competitive force; and (iii) at the time of completion of the purchase, the purchaser has, or can reasonably be expected to obtain, all necessary approvals for the purchase from the relevant competition authorities.
12. If the Commission has not approved the proposed purchasers of the 55% and the 45% interests in Newco, respectively, within [...] from the Effective Date, Alcoa shall give an irrevocable mandate to the Trustee to effect the divestiture within an additional period of [...] at no minimum price.
13. To assist the Commission in ensuring compliance with this Undertaking, Alcoa shall provide the Commission in a timely fashion with a copy of the letter to the proposed

purchaser offering a Bauxite Supply Contract on the terms above and, should such a contract be accepted by the purchaser, a copy of the signed Bauxite Supply Contract.

14. For the avoidance of doubt, in the event that the purchaser decides not to accept Alcoa's offer of a Bauxite Supply Contract, Alcoa shall be deemed to have complied with all its obligations under this Section of these Undertakings.

C. DIVESTITURE OF AN EQUITY INTEREST IN THE LONGVIEW SMELTER

15. Within [...] from the Effective Date, unless extended by the Commission in accordance with paragraph 27 of this Undertaking, Alcoa shall:
 - (i) sell, or cause to be sold, to a purchaser to be approved by the Commission, a 25% undivided interest in the assets of the Longview, Washington, smelter (the "Longview Interest"). Following this divestiture, Alcoa and the purchaser will operate Longview as a cost-sharing, production-sharing unincorporated joint venture, with each venturer separately and independently marketing its share of the aluminium output;
 - (ii) grant the purchaser of the Longview Interest preferential rights to take P0404 aluminium as its share of Longview's aluminium production; and
 - (iii) assign to the purchaser of the Longview Interest Reynolds' contractual obligations to McCook Metals LLC for the supply of P1020/A7E, P1015A, P0610A, P0506A, and P0404B unalloyed aluminum ingot.
16. To assist the Commission in determining whether any proposed purchaser of the Longview Interest is suitable, Alcoa shall submit a fully documented and reasoned proposal enabling the Commission to verify that: (i) it does not own a material direct or indirect interest in the proposed purchaser; (ii) the sale allows the Longview smelter to continue to operate as an active competitive force; and (iii) at the time of completion of the purchase, the proposed purchaser has, or can reasonably be expected to obtain, all necessary approvals for the purchase from the relevant competition authorities.
17. If the Commission has not approved a proposed purchaser within [...] from the Effective Date, Alcoa shall give an irrevocable mandate to the Trustee to effect the divestiture within an additional period of [...] at no minimum price.

D. TRUSTEES

18. If Alcoa is required to appoint a trustee in respect of the divestiture of any of Reynolds' Worsley Interest, Reynolds' Stade Interests, or the Longview Interest, it shall propose the name of an independent and experienced institution that it considers appropriate to be appointed as trustee. Unless otherwise provided, such proposal shall be made within ten (10) working days after the date at which the obligation to appoint a trustee enters into force. The Commission shall have the discretion to approve or reject the proposed institution in accordance with Section F. If the proposed institution is rejected, Alcoa shall submit the names of at least two further institutions, within five (5) working days of being informed of the rejection. If more than one name is approved by the Commission, Alcoa shall be free to

choose the trustee to be appointed from among the names approved. If all further names are rejected by the Commission, the Commission shall nominate a trustee to be appointed by Alcoa.

19. Alcoa shall appoint the trustee within five (5) working days after the Commission's explicit or implicit approval in accordance with Section F.
20. Along with its request for approval of a proposed trustee, Alcoa shall submit for the Commission's approval a proposed draft mandate setting forth in detail the scope of the mandate and the responsibilities to be performed under the mandate. At the Commission's reasonable request, Alcoa shall modify the proposed mandate, if necessary, to ensure that it is in accordance with the provisions of these Undertakings. Once the mandate has been executed, Alcoa shall not make any changes to such mandate without the Commission's approval.
21. The trustee's mandate shall include the following responsibilities:
 - a. to monitor the maintenance of the viability and saleability of Reynolds' Worsley Interest, Reynolds' Stade Interest and the Longview Interest in accordance with this Undertaking, and ensure that the rights Reynolds has as a shareholder in Worsley and Stade are executed on an independent arms' length basis consistent with their status, until their divestment to a purchaser;
 - b. to monitor the satisfactory discharge by Alcoa of the obligations entered into in these Undertakings (in so far as they fall within the scope of the trustee's mandate);
 - c. to monitor and advise the Commission as to the adequacy of the procedure for selecting the Purchaser(s) and as to the conduct of the negotiations;
 - d. to monitor and advise the Commission as to whether prospective Purchasers with whom Alcoa is or intends to negotiate are likely to satisfy the Commission's requirements;
 - e. to monitor and advise the Commission as to whether the agreements with the Purchaser will properly provide for the divestiture of Reynolds' Worsley Interest, Reynolds' Stade Interest and the Longview Interest as provided for herein;
 - f. to monitor the compliance of Alcoa and Reynolds with the ring-fencing provisions set out in Section E, below;
 - g. to provide written reports to the Commission on the progress of the discharge of its mandate, identifying any respects in which the trustee has been unable to discharge its mandate. Such reports shall be provided in English within ten (10) working days from the end of every [...] period following the trustee's appointment or at such other time(s) or time periods as the Commission may specify, and shall cover the developments of the previous two-month period. Alcoa shall receive simultaneously a non-confidential copy of such trustee reports; and
 - h. at any time, to provide to the Commission, at its request, a written or oral report on matters falling within the trustee's mandate. Alcoa shall receive

simultaneously a non-confidential copy of such additional written reports and shall be informed promptly of the non-confidential content of any oral reports.

22. The trustee's mandate as set out above shall not be extended or varied in any way by Alcoa, save with the express written consent of the Commission. Any instruction or request to the trustee from Alcoa which conflicts with the trustee's mandate will be considered null and void.
23. If these Undertakings require the mandate of a trustee to include the responsibility to conduct negotiations with, and propose a purchaser, the trustee shall:
 - (a) notify the Commission as soon as practically possible concerning the identity of purchasers with whom it has initiated negotiations and advise the Commission why it believes such purchasers are suitable, in view of the criteria specified above;
 - (b) end negotiations with any prospective purchaser, if the Commission determines that the negotiations are being conducted with an unsuitable purchaser; and
 - (c) carry out the negotiations with the view to concluding a binding contract for the divestiture of the assets that takes into account the financial interest of Alcoa (*i.e.*, to obtain the best price and terms possible within the context of the trustee's mandate).
24. Alcoa shall provide the trustee with all such assistance and information, including copies of all relevant documents, as the trustee may reasonably require in carrying out its mandate, and shall pay reasonable remuneration for its services.
25. As soon as the specific remedy with which the trustee has been entrusted has been implemented, the trustee shall request the Commission to be discharged. However, the Commission may at any time require the reappointment of the trustee if it subsequently appears that the relevant remedies might not have been fully and properly implemented.

E. RING-FENCING OF KEY PERSONNEL

26. Throughout the divestiture period and for three years following divestiture, Alcoa undertakes to refrain from hiring, or approaching with a view to hiring, such Reynolds personnel at Worsley and Stade who have had (or currently have) access to sensitive business, commercial, R&D, or other proprietary information, due to his or her professional position or function with Reynolds' Worsley or Stade Interests.

F. COMMISSION APPROVALS

27. If the Commission has not within ten (10) working days following receipt of a fully documented and reasoned request rejected in writing any proposal submitted to it for approval pursuant to paragraphs 1, 4, 11, 14, and 16 of these Undertakings, the proposal shall be deemed to be approved. With respect to any other proposals, the Commission's failure to decide within ten (10) working days from receipt of

Alcoa's fully documented and reasoned request shall constitute an exceptional circumstance for purposes of paragraph 27.

28. Provided that the procedure for approval of potential purchasers has been complied with, Alcoa shall be free to accept any offer or to select the offer it considers best in the event of a plurality of offers for the interests or assets to be divested.
29. Any requests or proposals requiring Commission approval shall be addressed to the Director of Directorate B of the Commission's Directorate General for Competition, 70, rue Joseph II, 1000 Brussels. Any communications to Alcoa shall be addressed to persons to be determined and communicated to the Commission before the Effective Date.

G. GENERAL PROVISIONS

30. Alcoa shall submit progress reports on the implementation of each of the above remedies to the Commission every [...] months from the Effective Date until the Undertaking is fully implemented.
31. At Alcoa's or any trustee's request, the Commission may extend any period in these Undertakings allowed for the conclusion of a binding contract for the divestiture of Reynolds' Worsley Interest, Reynolds' Stade Interests, the Longview Interest, or the period within which a Bauxite Supply Contract must be offered to the purchaser of Reynolds' Stade Interests. Such request may be made as early as [...] months, but no later than [...]*, prior to the expiration of the period and shall specify the exceptional circumstances that in Alcoa's or the trustee's opinion justify an extension. Such exceptional circumstances may include any delay in completing the on-going Hart-Scott-Rodino review process in the United States and/or any injunction or order entered by a court in the United States preventing or delaying the Transaction, in which case the Commission will grant a proportionate extension, taking into account the length of time taken to obtain all necessary regulatory approvals, together with any steps already taken to complete the envisaged divestitures. Any such delay shall not prevent Alcoa from taking the necessary preparatory steps with a view to completing any of the envisaged divestitures. Such exceptional circumstances shall also include any delay in the Commission's response to any request or proposal pursuant to these Undertakings beyond the time periods accorded to the Commission in these Undertakings.
32. Alcoa shall be deemed to have complied with its commitments under these Undertakings if within the relevant period (including any possible extensions), it has entered into a binding contract with a purchaser approved by the Commission. In the case of any divestiture, Alcoa shall complete the sale within a further period of [...]*, unless such period is extended by the Commission at Alcoa's fully documented and reasoned request.
33. If the approval of the Transaction by another antitrust authority is made subject to requirements that are potentially inconsistent with these Undertakings or that would together with the obligations in these Undertakings result in the divestiture of assets or businesses beyond what is necessary to eliminate overlap between Alcoa in any relevant markets, Alcoa may request a review and adjustment of these Undertakings

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in order to avoid such inconsistencies or any obligations beyond the obligation to eliminate such overlap.

34. Alcoa shall provide the Commission with such information as the Commission may require in connection with these Undertakings within ten (10) working days from receipt of the Commission's reasoned request.
35. Nothing in these Undertakings shall require Alcoa to take, or refrain from taking, any action, if such action or inaction would violate any applicable laws and regulations, nor shall it be interpreted so as to prevent Alcoa from gaining access to information which it needs to comply with its obligations under financial reporting, tax and securities laws.

IN WITNESS WHEREOF, the undersigned have caused this Undertaking to be executed as of April 12, 2000:

For ALCOA INC.

SIGNED

By: Alain Belda

Chief Executive Officer, Alcoa Inc.