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***Case No COMP/M.7342 - ALCOA/ FIRTH RIXSON***

Only the English text is available and authentic.

**REGULATION (EC) No 139/2004  
MERGER PROCEDURE**

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Article 6(1)(b) NON-OPPOSITION  
Date: 12/11/2014

***In electronic form on the EUR-Lex website under  
document number 32014M7342***



## EUROPEAN COMMISSION

Brussels, 12.11.2014  
C(2014) 8546 final

In the published version of this decision, some information has been omitted pursuant to Article 17(2) of Council Regulation (EC) No 139/2004 concerning non-disclosure of business secrets and other confidential information. The omissions are shown thus [...]. Where possible the information omitted has been replaced by ranges of figures or a general description.

PUBLIC VERSION

MERGER PROCEDURE

### **To the notifying party:**

Dear Sirs,

**Subject: Case M.7342 – Alcoa/ Firth Rixson  
Commission decision pursuant to Article 6(1)(b) of Council Regulation  
No 139/2004<sup>1</sup>**

- (1) On 8 October 2014, the European Commission received a notification of a proposed concentration pursuant to Article 4 of Council Regulation (EC) No 139/2004 by which Alcoa Inc. ("Alcoa" or the "Notifying Party", USA) acquires within the meaning of Article 3(1)(b) of the Merger Regulation control of the whole of Firth Rixson ("FR", United Kingdom) by way of purchase of shares.<sup>2</sup> Alcoa and FR will be collectively referred to as the "Parties".

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<sup>1</sup> OJ L 24, 29.1.2004, p. 1 ('the Merger Regulation'). With effect from 1 December 2009, the Treaty on the Functioning of the European Union ('TFEU') has introduced certain changes, such as the replacement of 'Community' by 'Union' and 'common market' by 'internal market'. The terminology of the TFEU will be used throughout this decision.

<sup>2</sup> Publication in the Official Journal of the European Union No C 366, 16.10.2014, p. 7.

## 1. THE PARTIES AND THE OPERATION

- (2) **Alcoa** is active in lightweight metals engineering and manufacturing – including aluminium, titanium, nickel and cobalt products at different levels of the value chain – for aerospace, automotive, power generation and other applications.
- (3) **FR** manufactures engineered products primarily for the aerospace industry but also for other sectors including power generation, oil and gas and mining. It supplies specialty metals, seamless rolled and flash-welded rings and disks, as well as closed and open die forgings and extruded forgings.
- (4) FR is currently controlled by the private equity group Oak Hill Capital Partners. Through a share purchase agreement, Alcoa and its subsidiary Alcoa IH Limited will purchase all the shares of FR and its affiliates. As a consequence, Alcoa will acquire sole control over FR within the meaning of Article 3(1)(b) of the Merger Regulation.

## 2. EU DIMENSION

- (5) The undertakings concerned have a combined aggregate worldwide turnover of more than EUR 5 000 million<sup>3</sup> (Alcoa: EUR 17 631 million; FR: EUR 737 million). Each of them has an EU-wide turnover in excess of EUR 250 million (Alcoa: EUR [...] million; FR: EUR [...] million), and they do not achieve more than two-thirds of their aggregate EU-wide turnover within one and the same Member State. The notified operation therefore has an EU dimension.

## 3. COMPETITIVE ASSESSMENT

- (6) The Parties are both active at different steps of the value chain for the production of forged and cast metal parts for various industrial applications. The value chain can be illustrated as follows:

(1) Metal raw materials → (2) Alloys → (3) Forged or cast metal parts

- (7) The first step concerns the procurement of metal raw materials in the form of primary or secondary metal. Primary metals are produced by processing and refining metal ores and can have different purity grades. Secondary metal is derived from the recycling of used metal parts or from the re-use of scrap resulting from the production of alloys or from the production of metal parts (sometimes known as 'revert').
- (8) The second step is the production of specific alloys<sup>4</sup> that enhance the properties of a certain metal. Alloys are produced by combining the alloy components in a molten state, generally through the use of a dedicated furnace. Depending on their intended end use, alloys are produced in different shapes, such as ingots and billets (long

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<sup>3</sup> Turnover calculated in accordance with Article 5 of the Merger Regulation.

<sup>4</sup> An alloy is a mixture or compound of two or more elements, at least one of which is a metal, called the primary or base metal (source: Form CO, page 8). Superalloys are alloys which have superior mechanical strength, good surface stability and corrosion resistance, and may have the ability to withstand high temperature without oxidizing or losing mechanical properties (see replies to the request for information (RFI) of 10 October 2014).

products) or plates and sheets (flat products). A specific type of ingot is a cast stick<sup>5</sup> which is used in the production of investment castings<sup>6</sup>.

- (9) The cobalt- and nickel-based cast sticks produced by the Parties are manufactured in Vacuum Induction Melting ("VIM") furnaces.<sup>7</sup> Suppliers can switch production from one type of cast stick to another but have to sequence melts in order to avoid cross contamination between nickel and cobalt.<sup>8</sup>
- (10) In the third step, the alloys are used to produce cast and forged metal parts. Casting is the process of producing parts by re-melting the alloy and pouring cut charges into a mould. Castings are generally used for the production of more complex parts with finer detail. Forging is the process of producing parts by using localised compressive forces to deform ingots of metal, often at high temperature, into the desired shape. A specific form of forging is ring rolling which uses a ring mill to transform metal into a ring shape. The forged or cast metal parts can be used in various applications, including aerospace, power generation, medical and automotive.<sup>9</sup>
- (11) The main customers for cast and forged metal parts are original equipment manufacturers (OEMs), in particular in the aerospace, automotive and industrial gas turbines (IGT) sectors.<sup>10</sup> OEMs play an important role because they often provide specifications for both the component they source and the alloy from which it is made.<sup>11</sup> In particular, in the aerospace sector, OEMs are involved in the choice of the cast stick used to manufacture a particular casting and require that the cast stick meets certain specifications. When the specifications are met, the OEM provides a certification to the cast stick manufacturer for the specific alloy. There is no need for certification in the IGT and other non-aerospace applications.<sup>12</sup> Some large OEMs also have their own foundries and therefore compete, to a certain extent, with their suppliers of cast and forged metal parts.<sup>13</sup>

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<sup>5</sup> The cobalt- and nickel-based cast sticks manufactured by Alcoa and FR are all superalloys (see replies to the RFI of 10 October 2014). In the rest of the decision, the terms alloys and superalloys will be used interchangeably.

<sup>6</sup> Products or components manufactured through the investment casting process. This process involves the design and manufacture of a ceramic mould, into which the desired metal is poured, after which the mould is removed in order to release the final product or investment casting. (source: Form CO, page 9).

<sup>7</sup> VIM uses electric currents to melt metals within a vacuum. By melting the alloys inside a vacuum, the alloy can be protected from the atmosphere and residuals. Many alloys contain elements which, if air melted, react with oxygen to form oxides. Oxides are detrimental to high quality melted alloys required by the aerospace, energy, medical and automotive industries. Source: Form CO, paragraph 81 and footnote 36.

<sup>8</sup> See replies to Questionnaire Q1 – Competitors – Cast sticks, question 11.

<sup>9</sup> Source: Form CO, paragraph 152. Blayson, World Investment Casting Market Review - EICF 28th International Congress, June 2014.

<sup>10</sup> Source: Form CO, paragraph 123.

<sup>11</sup> Source: Form CO, paragraph 83. See replies to Questionnaire Q2 – Customers – Cast sticks, question 39.1.

<sup>12</sup> Source: Form CO, paragraph 162.

<sup>13</sup> Source: Form CO, paragraph 260. See replies to Questionnaire Q2 – Customers – Cast sticks, question 4.

- (12) As explained in paragraph (9) above, the Parties are producers of nickel- and cobalt-based cast sticks.<sup>14</sup> In addition, there are potential vertical relationships between the Parties' activities since: (i) FR produces nickel- and cobalt-based cast sticks while Alcoa produces investment castings; and (ii) FR produces rolled rings using aluminium billets<sup>15</sup> as an input and Alcoa sells aluminium billets.<sup>16</sup> This horizontal overlap and the vertical relationships, together with the relevant market definitions, will be examined in detail in the following sections.

### 3.1. Cast sticks and Investment castings

#### 3.1.1. Market definition – Cast sticks

- (13) The Notifying Party submits that the relevant product market for alloys should be defined broadly and that there is no need for a segmentation based on the downstream processing stage of the alloy (i.e. forging or casting). As regards cast

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<sup>14</sup> In addition, the Parties both manufacture (i) nickel-based closed die forged disks for IGT applications (Alcoa produces forged disks that have a diameter of at least [...] inches, FR's forged disks have a diameter of maximum [...] inches), (ii) rings for space launch applications (Alcoa manufactures aluminium open die forged disks with an outer diameter of at least [...] inches and a thickness of at least [...] inches and FR's seamless rolled rings for space launch and missile applications have an outer diameter of up to [...] inches and a thickness of up to [...] inches) and (iii) landing gear components. The overlaps in these activities will, however, not lead to any affected market under any plausible market definition. Regarding nickel-based closed die forged disks for IGT applications, the combined market share of the Parties in 2013 would be below [10-20]% under any plausible market definition. Regarding rings for space launch applications, the highest combined market share in 2013 would have been below [5-10]%. Regarding landing gear components, the majority of Alcoa's landing gear components are aluminium based while FR does not produce aluminium based landing gear components. FR does produce components for landing gear (including main landing gear) based on steel while Alcoa does not produce any steel-based landing gear components. There is therefore no overlap in either aluminium- or steel-based landing gear components between the Parties. Conversely the Parties both produce titanium-based landing gear components: FR manufactures titanium-based nose landing gear components and Alcoa manufactures titanium-based main landing gear components. As regards titanium landing gear components, the combined market shares in 2013 would have been below [0-5]% on a hypothetical worldwide market for titanium landing gear components. The Parties also both purchase: (i) nickel, cobalt and other metals, and (ii) nickel-based ingots. The overlaps in those purchases will, however, not lead to any affected market under any plausible market definition. Regarding nickel, cobalt, and other metals, the Parties' combined purchase shares were below [10-20]% at worldwide level in 2013. Regarding nickel-based ingots, the Parties' combined purchase shares were below [10-20]% in 2012 regardless of the end application. As a consequence, none of the above-mentioned activities will be discussed further in this decision.

<sup>15</sup> Billets are one of the two types of input products for forgings, the other one being ingots. Billets are in the form of a bar and have a smaller size than ingots. See Form CO, glossary. Ingots and billets have different thicknesses, as the former usually have a diameter greater than or equal to about 9 inches and the latter a diameter below 9 inches. See Questionnaire Q4 for customers of aluminium-based alloys in billet form, question 6.1.

<sup>16</sup> In addition, the proposed transaction gives rise to affected markets with respect to the following vertical relationships: (i) sale of titanium and nickel scrap by FR and manufacture of titanium and nickel melting by Alcoa; and (ii) sale of titanium, iron and nickel scrap by Alcoa and manufacture of titanium and steel seamless rolled rings, other titanium forgings and nickel-based close die forging by FR. These vertical relationships are, however, only virtual as the upstream products manufactured by Alcoa and FR cannot be used by the other party due to differences in the alloy formulations produced by the Parties. In 2013 and 2014, FR also purchased some extruded rods made of a specific aluminium alloy ([F]) from Alcoa for one of its products that represents annual sales of below USD [...]. Alcoa estimates its share of a separate market for aluminium [F] extruded rods to amount to less than [5-10]% worldwide and less than [0-5]% in the EEA in 2013. As a consequence, none of these vertical relationships will be discussed further in this decision.

sticks, which are the only alloy input products used for castings, the Notifying Party considers that there is no need to segment by metal type (i.e. cobalt- versus nickel-based cast sticks) or by end-application (e.g. aerospace, IGT and other applications). Likewise, the Notifying Party submits that it is not appropriate to define the relevant market by individual type of alloy. In any event, the Notifying Party submits that the precise market definition can be left open as it will not change the assessment of the proposed transaction.

- (14) The Notifying Party submits that the geographic scope of the cast sticks market is worldwide but that this point can be left open as the proposed transaction does not raise competition concerns regardless of whether the market is worldwide or EEA-wide.
- (15) The Commission has not analysed the market for cobalt-based and nickel-based cast sticks in any of its previous decisions. However, for certain metals (e.g. titanium), the Commission has previously considered a distinction on the basis of the form of the alloys, for instance between bars and billets or ingots, slabs and electrodes, and potentially even by alloy, whilst ultimately leaving the exact market definition open.<sup>17</sup>
- (16) A majority of respondents to the market investigation indicated that alloy input products for castings and forgings belong to different markets. On the demand side, the specifications of customers are different. On the supply side, the production of input products for forgings requires different assets compared to the production of inputs for castings.<sup>18</sup>
- (17) As regards a possible segmentation by end-application (e.g. IGT and aerospace), a majority of OEMs and casters that have knowledge of different end-applications and that responded to the market investigation stated that there are differences between end uses, especially in terms of certification requirements that suppliers need to meet in order to operate in a specific segment.<sup>19</sup> This therefore speaks in favour of defining distinct markets by end-application.
- (18) At the same time, other elements go against defining distinct markets by end-application. First, a majority of cast sticks producers that responded to the market investigation indicated that the production process remains the same irrespective of the cast sticks' end-use is.<sup>20</sup>
- (19) Second, many alloys are used for more than one end-application. For instance, in 2014 year-to-date<sup>21</sup>, several superalloys have been specified by Alcoa customers for the production of investment cast components for both aerospace and IGT applications.<sup>22</sup> Similarly, customers to whom FR supplies cast sticks can use the same

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<sup>17</sup> Case M.6765 – Precision Castparts/Titanium Metals, paragraphs 20, 23 and 25.

<sup>18</sup> See replies to Questionnaire Q1 – Competitors – Cast sticks, questions 14, 15 and 16, and replies to Questionnaire Q2 – Customers – Cast sticks, questions 9 and 10.

<sup>19</sup> See replies to Questionnaire Q2 – Customers – Cast sticks, question 12.

<sup>20</sup> See replies to Questionnaire Q1 – Competitors – Cast sticks, question 18.

<sup>21</sup> From the beginning of the year 2014 up until the date of the Response to the RFI of 22 October 2014.

<sup>22</sup> These are alloys [...]. See reply to the RFI of 22 October 2014.

specific alloys in the IGT, aerospace and the automotive sectors, or both in the IGT and aerospace sectors.<sup>23</sup>

- (20) Third, cast stick suppliers generally have limited knowledge of the end-application for which customers use the cast sticks supplied.<sup>24</sup> For instance, FR is unable to specify in detail the end-applications for which its cast sticks are used, because the investment casting customers typically order cast sticks of a particular specification without providing any details of the precise components to be produced from such cast sticks.<sup>25</sup> As a consequence, cast sticks suppliers have limited ability to price discriminate between cast sticks for different end-applications.<sup>26</sup>
- (21) As regards a possible segmentation by technology, producers of cast sticks that responded to the market investigation indicated that they can only use VIM furnaces to produce cast sticks.<sup>27</sup> At the same time, certain casters and OEMs mentioned that the different technologies used in the investment casting process<sup>28</sup> might have an impact on the requirements set on cast sticks. The Parties have indicated that some technologies require alloys of a better quality or additional elements such as rhenium or tantalum.<sup>29</sup> However, elements submitted by the Parties indicate that some alloys may be used across the different technologies and that suppliers of cast sticks generally have the ability to produce cast sticks suitable for every technology.<sup>30</sup>
- (22) As regards a possible segmentation by metal type between cobalt-based and nickel-based cast sticks or by type of alloy, a majority of respondents to the market investigation suggested that different types of cast sticks are not substitutable from the customer's perspective but that suppliers can switch relatively easily between

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<sup>23</sup> These are alloys [...]. See reply to the RFI of 22 October 2014.

<sup>24</sup> See reply to the RFI of 22 October 2014.

<sup>25</sup> See reply to the RFI of 22 October 2014.

<sup>26</sup> See Commission Notice on the definition of relevant market for the purposes of Community competition law, OJ C 372, 9.12.1997, p. 5, paragraph 43.

<sup>27</sup> See replies to Questionnaire Q1 – Competitors – Cast sticks, question 17.

<sup>28</sup> See for instance minutes of the conference call with a market player of 7 October 2014, at 5:00 pm. There are three main technologies to produce investment castings. In response to customer demand to further increase the resistance of investment castings, various changes to the production processes have been developed. The aim of these developments is to strengthen the grain boundaries (which are the weak link in investment cast parts) or to remove grain boundaries altogether. The equiax technology is the conventional method for producing investment castings. It leads to parts with a randomly orientated grain structure. The directional solidification process arranges the grain structure of the superalloy in a single direction, thereby leading to more resistant parts. The single crystal technology eliminates grain boundaries altogether: the investment cast part consists of a single grain (crystal). This requires a special solidification technique at the part production stage (i.e., when casting the final component). Removing the grain boundary strengthening elements (i.e., producing a single crystal) raises the melting point of the superalloy, which allows them to be used at higher temperatures. See reply to RFI of 10 October 2014.

<sup>29</sup> See reply to RFI of 10 October 2014.

<sup>30</sup> See reply to RFI of 10 October 2014 and reply to RFI of 17 October 2014.

the various products as they are usually produced in the same facilities, and suppliers do not tend to specialise in a particular type.<sup>31</sup>

- (23) In relation to the geographic scope of the market, a majority of respondents to the market investigation indicated that the market might be at least EEA-wide. In fact, whereas all the suppliers of cast stick operate at worldwide level and prices are to a large extent similar across different areas of the world, some EEA cast stick customers expressed a preference for sourcing at regional level, when that is possible.<sup>32</sup>
- (24) For the purpose of the present case, the precise product and geographic market definition can be left open because the proposed transaction does not raise serious doubts as to its compatibility with the internal market regardless of the exact market definition.

### 3.1.2. *Market definition – Castings*

- (25) The Notifying Party considers that the precise product and geographic market definition can be left open.
- (26) The Commission has previously considered defining separate product markets for cast and forged (titanium) parts based on a lack of demand-side and supply-side substitutability.<sup>33</sup> This question was, however, ultimately left open. The Commission has also considered, but left open the question, whether an additional segmentation could be made according to the end use application such as aerospace and other industrial uses.<sup>34</sup>
- (27) Within parts for aerospace applications, the Commission has considered additional sub-segmentations for castings into (i) aerospace airfoil castings; (ii) aerospace engine structural castings and (iii) aerospace airframe structural castings. Similarly the Commission envisaged segmenting the product market for forgings into (i) rotating engine components; (ii) non-rotating engine components (including forged rings), (iii) airframe structures, (iv) aero structures, and (v) fasteners. However, the product market definition was ultimately left open.<sup>35</sup>
- (28) The Commission also previously left open whether the markets were global or EEA-wide in scope.<sup>36</sup>
- (29) Forged rings are a type of non-rotating engine component which can be manufactured through a seamless forging process<sup>37</sup> or through flash welding.<sup>38</sup> In a

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<sup>31</sup> See replies to Questionnaire Q1 – Competitors – Cast sticks, questions 9, 10, 11, 12 and replies to Questionnaire Q2 – Customers – Cast sticks, questions 7 and 8.

<sup>32</sup> See replies to Questionnaire Q1 – Competitors – Cast sticks, questions 20, 22 and 23, and replies to Questionnaire Q2 – Customers – Cast sticks, questions 20, 21 and 22.

<sup>33</sup> Case M.6765 – Precision Castparts/Titanium Metals, decision of 19 December 2012, paragraph 38; see also Case M.1919 – Alcoa/Cordant, decision of 19 May 2000, paragraph 10.

<sup>34</sup> Case M.1919 - Alcoa/Cordant, decision of 19 May 2000, paragraph 10.

<sup>35</sup> Case M.6765 – Precision Castparts/Titanium Metals, decision of 19 December 2012, paragraphs 37-44; Case M.1919 - Alcoa/Cordant, decision of 19 May 2000, paragraphs 10, 17 and 25.

<sup>36</sup> Case M.6765 – Precision Castparts/Titanium Metals, decision of 19 December 2012, paragraphs 45-47.



previous decision, the Commission left open whether flash-welded and seamless rings belong to the same relevant product market.<sup>39</sup> The Commission concluded in the same decision that the market was worldwide.<sup>40</sup>

- (30) The appropriateness of drawing a distinction between castings and forgings has been confirmed by the responses to the market investigation. From a demand-side point of view, different casting components are clearly not substitutable as each component is used for different purposes.<sup>41</sup> However, the responses to the market investigation were mixed regarding the degree of supply-side substitutability between (i) different types of casting components within each industry (i.e. IGT and aerospace) and (ii) the same type of casting component across different end-applications (i.e. airfoils for IGT and aerospace).
- (31) Certain respondents to the market investigation also mentioned distinctions between castings produced on the basis of different technologies. In particular: (i) equiax technology (the standard and cheapest process with the lowest technology); (ii) directional solidification; and (iii) single crystal technology (expensive with high quality) could be distinguished due to the significant price and quality differences.<sup>42</sup> At the same time, there also seems to be a certain degree of substitutability between the castings produced according to the different technologies.<sup>43</sup>
- (32) In relation to the geographic scope of the market(s), the Commission considers that, based on the responses to the market investigation, the relevant market(s) could be at least EEA-wide. Whilst a majority of castings customers source at worldwide level, a number of them claimed that there are price differences between the different areas of the world.<sup>44</sup>
- (33) For the purpose of the present case, the precise product and geographic market definition can be left open because the proposed transaction does not raise serious doubts as to its compatibility with the internal market regardless of the exact market definition.

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37 For the production of a seamless rolled ring a hole is punched in a piece of metal prior to being rolled into the desired shape.

38 To make flash welded rings, a rolled or extruded bar is cold formed to make a ring. The ends are flash butt welded which involves applying an electric current across the interface of the two ends to bring the metals to a plastic state. The two ends are subsequently brought together under very high force sufficient to weld them into one.

39 Case M.4561 - GE/Smiths Aerospace, decision of 23 April 2007, paragraph 45.

40 Case M.4561 - GE/Smiths Aerospace, decision of 23 April 2007, paragraph 46.

41 See replies to Questionnaire Q2 – Customers – Cast sticks, questions 14 to 15.

42 See for instance minutes of the conference call with a market player of 8 October 2014 at 4:15 pm,.

43 See for instance minutes of the conference call with a market player of 8 October 2014 at 4:15 pm.

44 See replies to Questionnaire Q2 – Customers – Cast sticks, questions 23 and 24.

### 3.1.3. *Competitive assessment*

#### 3.1.3.1. Horizontal overlap in upstream cast stick market

##### 3.1.3.1.1. Market shares

- (34) According to the Commission's Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings,<sup>45</sup> very large market shares - 50 % or more - may in themselves be evidence of the existence of a dominant market position. Conversely, there is an indication that the concentration will not impede effective competition where the market share of the undertakings concerned does not exceed 25 % either in the internal market or in a substantial part of it. However, market shares only provide a first indication of market power and other important factors should also be taken into account such as the constraining influence of competitors, especially if they have the ability and incentive to increase their supplies, whether the concentration removes an important competitive force, or whether the parties to the concentration are close competitors.<sup>46</sup>
- (35) According to the Parties' estimates, the combined market share of the merged entity in 2013 would have been [10-20]% in the worldwide market for cobalt- and nickel-based cast sticks for all applications and [10-20]% in the EEA. Even if the markets were to be defined by end-application or by technology, the combined market share of the merged entity in 2013 would have been below 50% in all potential markets<sup>47</sup>.
- (36) According to the Parties, they will continue to face a number of competitors after the proposed transaction. The Commission notes, however, that a number of smaller companies listed as cast sticks producers in the Form CO, such as KBM Affilips B.V. and Aubert & Duval amongst others, are not active in this sector.<sup>48</sup>
- (37) The Commission has therefore undertaken an extensive market reconstruction exercise which showed that, despite the absence of these smaller companies, the Parties will continue to face a number of competitors and have overestimated their market shares, especially in the IGT sector. As a consequence, the Commission considers the market shares provided in the Form CO can be used as a relevant proxy to assess the competitive landscape.

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45 Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings OJ C 31, 5.2.2004 ("Horizontal Merger Guidelines"), p. 3, paragraphs 17 and 18.

46 Horizontal Merger Guidelines, paragraphs 17, 28, and 37.

47 Form CO, page 52 and 53. It should be noted that the market shares presented in this section consider only the market shares of the different suppliers in the external sales market. The cast sticks used for internal consumption by the vertically integrated parties (Alcoa, PCC and Doncasters) are excluded. The external sales of Alcoa accounted for [...] % of their total cast sticks sales in 2013, for PCC [...] % and for Doncasters [...] % (Substantive Assessment submitted on 23 October 2014, paragraph 39).

48 See replies to Questionnaire Q1 – Competitors – Cast sticks, questions 5.1 and 10.

**Table 1: Market shares in cobalt- and nickel-based cast sticks – Source: Form CO**

Cobalt- and nickel-based cast sticks (2013, by volume [kg])								
		Alcoa	FR	Combined	PCC	Doncasters	Treibacher	Others
<b>Cobalt and nickel-based cast sticks for <u>all</u> applications</b>	WW	[5-10]%	[10-20]%	<b>[10-20]%</b>	[40-50]%	[10-20]%	[0-5]%	[20-30]%
<b>Cobalt and nickel-based cast sticks for <u>all</u> applications</b>	EEA	[5-10]%	[10-20]%	<b>[10-20]%</b>	[50-60]%	[10-20]%	NA	[10-20]%
<b>Cobalt and nickel-based cast sticks for <u>aerospace</u> applications</b>	WW	[10-20]%	[5-10]%	<b>[20-30]%</b>	[30-40]%	[20-30]%	<1%	[20-30]%
<b>Cobalt and nickel-based cast sticks for <u>aerospace</u> applications</b>	EEA	[10-20]%	[0-5]%	<b>[10-20]%</b>	[40-50]%	[20-30]%	<1%	[5-10]%
<b>Cobalt and nickel-based cast sticks for <u>IGT</u> applications</b>	WW	[10-20]%	[30-40]%	<b>[40-50]%</b>	[30-40]%	[0-5]%	<1%	[10-20]%
<b>Cobalt and nickel-based cast sticks for <u>IGT</u> applications</b>	EEA	[10-20]%	[20-30]%	<b>[30-40]%</b>	[40-50]%	[5-10]%	<1%	[10-20]%

(38) As regards market shares based on a hypothetical segmentation between cast sticks suitable for the equiax, directional solidification and single crystal techniques, the Notifying Party has limited information as the Parties generally do not know the type of casting process for which the cast stick will be used. The Notifying Party has nonetheless provided its best estimates of the combined market share of the merged entity in 2013. It considers that the combined market shares of the merged entity in 2013 on the potential markets for (i) equiax cast sticks; and (ii) cast sticks for directional solidification would have been similar to its market shares on the overall market for cast sticks.<sup>49</sup> The merged entity's estimates of its combined market share in 2013 for the cast sticks suitable for single crystal are summarised in the table below.

<sup>49</sup> See reply to the RFI of 17 October 2014.

**Table 2: Market shares in cobalt- and nickel-based cast sticks for Single Crystal technology –  
Source: Parties' estimates (reply to RFI of 17 October 2014)**

Cobalt- and nickel-based cast sticks (2013, by volume [kg])							
		Alcoa	FR	Combined	PCC	Doncasters	Others
<b>Cobalt and nickel-based cast sticks – Single Crystal</b>	WW	[10-20]%	[5-10]%	<b>[20-30]%</b>	NA	NA	NA
<b>Cobalt and nickel-based cast sticks – Single Crystal</b>	EEA	[10-20]%	[0-5]%	<b>[20-30]%</b>	NA	NA	NA

- (39) According to the Parties' estimates, their combined market share in 2013 on a potential market for nickel-based cast sticks only would have been [10-20]% and [10-20]% at worldwide and EEA-level respectively.<sup>50</sup> Nickel is more commonly used than cobalt for the production of cast sticks.<sup>51</sup> As a consequence, given the Parties' overall estimated market share, their combined market share in 2013 for cobalt-based cast sticks only should not be materially different from their combined market share for nickel-based cast sticks.
- (40) Finally, should the relevant markets be defined by alloy, the Notifying Party estimates that, for most of them, its market share in 2013 would have been below [30-40]% at worldwide and EEA level. While the Notifying Party cannot exclude that on certain markets the merged entity would have had market shares in 2013 above [30-40]%, it considers that, in any event, the combined market share of the Parties would have been below 50%. Moreover, on none of these hypothetical markets would the merged entity be the only possible supplier of the alloy at issue.<sup>52</sup>
- (41) For the reasons set out below, even on the potential markets where the merged entity would have had a combined market share higher than 25% in 2013, the proposed transaction will not raise serious doubts as to its compatibility with the internal market because: (i) there will be a sufficient number of significant alternative suppliers left on the market with spare capacity; (ii) FR did not exercise more influence on the market(s) than its relatively limited market share suggests; and (iii) OEMs and investments casters can adopt counter-strategies in case of a price increase.

#### 3.1.3.1.2. Existence of alternative competitors

- (42) For the reasons set out below, the Commission considers that a number of alternative competitors on the cast stick markets will continue to exercise a competitive constraint on the merged entity.

<sup>50</sup> Source: Form CO, paragraph 163.

<sup>51</sup> See for instance minutes of the conference call with a market player of 1 October 2014 at 5.00 pm.

<sup>52</sup> See reply to the RFI of 17 October 2014.

- (43) First, the merged entity will continue to face competition from a number of competitors. These competitors are the following:
- a. Precision Castparts Corporation (PCC) is a vertically integrated US-based supplier of cast sticks for aerospace, IGT and other applications, and is also active in the downstream market for investment castings. PCC has been referred to by several market participants as the market leader on the cast sticks market and the producer with alloys of the best quality.<sup>53</sup>
  - b. Doncasters is a vertically integrated UK-based company active both in the supply of cast sticks and downstream in the supply of investment castings. Doncaster has been mentioned by several market participants as a credible alternative to Alcoa and FR.
  - c. IHI<sup>54</sup> is a Japan-based supplier active both upstream, in the cast sticks sector, and downstream, in the supply of investment castings. Even though some market participants based in the EEA have indicated that its location in Japan is problematic due to increased lead times, others have mentioned IHI as a credible competitor to Alcoa and FR for at least some superalloys.<sup>55</sup>
  - d. Treibacher is an Austrian supplier of cast sticks. It entered the cast stick market in 2004 and has been focusing mainly on automotive applications. It has however started to supply cast sticks for IGT applications.<sup>56</sup>
- (44) The merged entity will therefore continue to face competition from a number of competitors, in particular two large vertically integrated companies: PCC and Doncasters. These companies will exercise competitive pressure on the merged entity despite being vertically integrated: the market investigation did not provide any clear evidence that vertically integrated players generally favour their internal consumption to the detriment of third party sales.<sup>57</sup> On the contrary, the Commission has determined, based on the responses it received to its market investigation, that integrated suppliers have sold cast sticks to third parties in the past and there is no evidence that they intend to cease to do so.
- (45) Second, in addition to the direct constraint exercised by these competitors on the upstream external sales market, the merged entity will be indirectly constrained when setting its cast sticks prices to independent casters by the existence of competition from the integrated companies on the downstream market<sup>58</sup>. The combined market

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<sup>53</sup> See for instance minutes of the conference call with a market player of 8 October 2014 at 3.15 pm.

<sup>54</sup> IHI's subsidiary in charge of producing cast sticks is called IHI Masters Metal (IMM).

<sup>55</sup> See for instance minutes of the conference call with a market player of 1 October 2014 at 5.00 pm.

<sup>56</sup> Treibacher recently won significant orders from PBS (customer active in IGT) in an internet auction held in April 2014 in which up to five suppliers competed for various lots of IN713LC cast sticks. See Annex 6 to FR's response to the RFI of 3 October 2014.

<sup>57</sup> See for instance replies to Questionnaire Q2 – Customers – Cast sticks, question 38.

<sup>58</sup> Cast sticks for internal consumption have been excluded from the relevant market as explained in footnote 47. Even assuming that the vertically integrated suppliers PCC and Doncasters would not make the internally consumed cast sticks available in the upstream external sales market, the internally consumed cast sticks by PCC and Doncasters would still limit the merged entity's ability to raise cast stick prices to independent casters. Indeed, the independent casters would no longer be competitive compared to PCC's and Doncasters' downstream casting companies if prices of cast sticks were too high.

shares in the upstream external sales cast stick market therefore most likely overestimate the degree of market power.

- (46) Third, respondents to the market investigation indicated that cast stick customers usually buy cast sticks from several suppliers.<sup>59</sup>
- (47) Fourth, as these alternative suppliers have spare capacity,<sup>60</sup> they will have the ability to expand output if the merged entity were to increase prices post-transaction.<sup>61</sup>

#### 3.1.3.1.3. Role of FR

- (48) Some market participants suggested that FR – as the last significant remaining non-vertically integrated producer of cast sticks – may play a more important role on the market than its limited market share suggests, in particular due to a pricing policy that is allegedly more aggressive than that of other cast stick producers.
- (49) For the reasons set out below, however, the Commission considers that FR has not played a more important role on the market because of its aggressive pricing policy or any another important feature such as the quality of its production, level of innovation or production capacity.
- (50) First, some respondents to the market investigation indicated that FR has neither been consistently pricing below its competitors nor was particularly aggressive price-wise. On the contrary, it seems that FR does not offer good quality at low prices, and that FR was unable to sustain a competitive price offer it had made.<sup>62</sup>
- (51) Second, this is confirmed by the bidding data submitted by the Notifying Party according to which FR regularly loses tenders to rivals that offered more competitive prices. FR lost [...]% of the tendered volume in 2013 and 2014 to competitors. In [...]% of the tenders where FR lost volumes to competitors, low pricing is explicitly noted as a reason for the customer's award of the assigned volumes.
- (52) Third, FR submitted the results of a recent internet tender for various lots run by a large IGT customer located in the EEA. The screen shot of the online tender results indicates the prices offered by FR compared to the prices offered by (unidentified) competing suppliers. For no lot was FR's price the cheapest<sup>63</sup>.
- (53) Fourth, the margin analysis undertaken by the Commission confirms that FR is not consistently more aggressive price-wise than Alcoa. When comparing the margins of FR with those of Alcoa, there is no clear indication that FR has lower margins. Of the 12 alloys which both FR and Alcoa sold in 2013, FR had lower margins in six

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<sup>59</sup> See replies to Questionnaire Q2 – Customers – Cast sticks, question 26.

<sup>60</sup> This is based on data regarding cast sticks collected by the consultancy Steel & Metal Research for Alcoa (Form CO, paragraph 160).

<sup>61</sup> Substantive Assessment submitted on 23 October 2014, paragraph 35.

<sup>62</sup> See for instance minutes of the conference call with a market player of 6 October 2014 at 4.00 pm., minutes of the conference call with a market player of 8 October 2014, at 3:15 pm.

<sup>63</sup> See reply to question 7f of the RFI of 3 October 2014.

instances and Alcoa in five instances. For one alloy, FR had a higher margin than Alcoa's Dover facility, but a lower margin than Alcoa's Exeter facility.<sup>64</sup>

- (54) Fifth, FR was not described by the respondents to the market investigation as a particularly innovative company or as a company that has consistently the best quality products.<sup>65</sup> Of its own admission, FR had a "*relatively poor reputation*" in 2006/2007 and decided only in the past 6-7 years to move up the value chain by producing better quality alloys. It is still not certified by some OEMs in the aerospace segment.<sup>66</sup>
- (55) Finally, FR cannot expand its production in a manner that would influence a large part of the cast sticks market since its production capacity accounts for only a very limited part of the total production capacity.

#### 3.1.3.1.4. Possible counter-strategies for OEMs and investment casters

- (56) According to the Notifying Party, OEM customers can effectively sponsor new entry or help existing cast stick suppliers climb-up the value chain from easier end-applications (e.g. automotive) into more demanding end-applications (e.g. aerospace). Investment casters can also, with or without the help of OEMs, start producing cast sticks ("backward integration").
- (57) The Commission considers that OEMs and investment castings companies can indeed adopt such counter-strategies should the merged entity try to increase cast stick prices.
- (58) Past examples support the Notifying Party's arguments as to the sponsored development of cast sticks manufacturers and the possible backward integration of investment casters.
- (59) For instance, FR was supported by its customer Chromalloy when it revamped its cast stick business in 2006/2007 and was then able to obtain certification from other customers.<sup>67</sup>
- (60) Similarly, Chromalloy, [...], has built its own furnace in order to self-supply cast sticks as of 2015.<sup>68</sup>

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<sup>64</sup> These are Alcoa's two cast sticks production facilities located in the United States and the United Kingdom respectively. See reply to RFI of 3 October 2014.

<sup>65</sup> See for instance minutes of the conference call of 8 October 2014 at 3.15 pm, and minutes of the conference call with a market player of 1 October 2014 at 5.00 pm.

<sup>66</sup> See reply to RFI of 10 October 2014.

<sup>67</sup> See reply to RFI of 10 October 2014.

<sup>68</sup> See Annex 6.4 to the Form CO: Chromalloy press release of 7 November 2013 retrieved at <http://www.chromalloy.com/files/newspressrelease/ce4flbfe-f719-4c9b-b41a-ca35f0253875.pdf>

- (61) At the same time, the Commission considers, based on responses to the market investigation that while such counter-strategies are possible, their importance should not be overestimated. An OEM acknowledged that it could help promoting other suppliers in the certification process.<sup>69</sup> Similarly, an investment caster indicated that it may want to enter the cast sticks market but stressed the difficulties of doing so given the time and investments required.<sup>70</sup>
- (62) In addition to the counter-strategies mentioned above, certain OEMs benefit from long term agreements with cast sticks suppliers for the supply of cast sticks. These agreements, which typically last several years, generally contain clauses that can protect them against price increases and provide OEMs with sufficient time to turn to alternative cast sticks suppliers should the merged entity increase the price of cast sticks.<sup>71</sup>

#### 3.1.3.1.5. Conclusion

- (63) In light of all the above, the Commission considers that the proposed transaction does not raise serious doubts as to its compatibility with the internal market with respect to the horizontal overlaps between the Parties' activities regarding the manufacture and supply of nickel- and cobalt-based cast sticks.

#### 3.1.3.2. Vertical relationships

- (64) As set out in section 3.1.3.1, the combined share of Alcoa and FR of the upstream cast sticks market in 2013 was [10-50]% depending on the exact definition of the relevant market.
- (65) As regards the downstream markets, Alcoa, according to its own estimates, had the following<sup>72</sup> market shares in 2013 in the potential global markets for IGT airfoils and aerospace airfoils.

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<sup>69</sup> See for instance minutes of the conference call with a market player of 29 August 2014 at 3.00 pm.

<sup>70</sup> See for instance replies to Questionnaire Q2 – Customers – Cast sticks, question 34.

<sup>71</sup> See for instance replies to Questionnaire Q2 – Customers – Cast sticks, questions 27 and 28. See for instance minutes of the conference call with a market player of 26 September 2014, at 4:30 pm and of 7 October 2014, at 5:00 pm.

<sup>72</sup> Alcoa's market shares in 2013 were slightly lower at EEA level with an estimated [30-40]% market share in IGT airfoils and an estimated [50-60]% market share in aerospace airfoils.



**Table 3: Market shares in Investment castings (Worldwide)<sup>73</sup> – Source: Form CO<sup>74</sup>**

Investment castings (2013, by value)				
	IGT Airfoils	Aerospace Airfoils	Aerospace engine structural castings	Aerospace airframe structural castings IGT
Alcoa	[40-50]%	[50-60]%	[5-10]%	<1%
PCC	[30-40]%	[30-40]%	[50-60]%	[50-60]%
Doncasters	[10-20]%	N/A	N/A	N/A
Others <sup>75</sup>	[5-10]%	[5-10]%	[40-50]%	[40-50]%
Total	100%	100%	100%	100%

(66) According to its estimates, Alcoa had approximately similar market shares in 2013 if the IGT airfoils and aerospace airfoils are segmented by technologies.

**Table 4: Market shares in Investment castings for aerospace airfoils split by technology (Worldwide) – Source: Reply to the RFI of 17 October 2014<sup>76</sup>**

*[Alcoa's estimate of total market volume and competitors' share for aero airfoils split by technology (equiax, directionally solidified and single crystal) showing that Alcoa's position in the downstream aero airfoil segment leads to an affected market for the purposes of the Form CO]*

**Table 5: Market shares in Investment castings for IGT airfoils split by technology (Worldwide) – Source: Reply to the RFI of 17 October 2014<sup>77</sup>**

*[Alcoa's estimate of total market volume and competitors' share for IGT airfoils split by technology (equiax, directionally solidified and single crystal) showing that Alcoa's position in the downstream IGT airfoil segment leads to an affected market for the purposes of the Form CO]*

<sup>73</sup> These numbers exclude the sales produced by the foundries owned by OEMs.

<sup>74</sup> Alcoa's market shares in structural castings in 2013 are provided Table 3 for the sake of completeness. Given, however, that they were below [10-20]%, structural castings will not be discussed further in this decision.

<sup>75</sup> This category includes independent casters such as Precicast, Chromalloy, Hitchiner, CPP and Zollern.

<sup>76</sup> These numbers exclude the sales produced by the foundries owned by OEMs. Alcoa's market shares in 2013 were lower at EEA level where they were [...] for equiax, directional solidification and single crystal respectively.

<sup>77</sup> These numbers exclude the sales produced by the foundries owned by OEMs. Alcoa's market shares in 2013 were lower at EEA level where they were [...] for equiax, directional solidification and single crystal respectively.

- (67) A few market players have submitted that, as a result of the proposed transaction, the last significant independent cast sticks supplier (FR) will disappear from the market leaving only three vertically integrated suppliers: PCC, Doncasters and Alcoa. Most of these market players also do not consider that Treibacher, despite its recent entry on the cast sticks market, is a real alternative supplier. Equally, they do not consider IHI – another vertically integrated competitor - to be a credible alternative supplier mainly because of alleged quality reasons and its location in Japan.
- (68) The same market players also argue that as a consequence of the removal of the last significant independent cast stick supplier, the investment castings producers will only be able to source cast sticks from integrated suppliers (i.e. from their own competitors). These market players fear that the prices of cast sticks will increase, that supply conditions will deteriorate, and/or that fewer quantities will be available on the market as Alcoa could internally use the cast sticks to produce investment castings. One of those market players also expressed a concern that Alcoa could decrease FR's production or even shut down FR's facilities which would lead to a price increase of cast sticks.<sup>78</sup>
- (69) As a preliminary point, the Commission recalls that the fact that the proposed transaction concerns the most significant non-vertically integrated cast sticks supplier (FR), leaving mostly vertically integrated suppliers, will not significantly change the competitive dynamics on the cast stick market(s). This is because, as mentioned in paragraph (44), vertically integrated companies have sold cast sticks to third parties in the past and there are no indications that they will cease to do so in the future.
- (70) Furthermore, for the reasons set out in paragraphs (71) to (87) below, the Commission considers that the merged entity will have neither the ability nor the incentive to foreclose access to cast sticks.

#### 3.1.3.2.1. Ability to foreclose

- (71) According to the Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings ('the Non-Horizontal Merger Guidelines'), for input foreclosure to be a concern, the vertically integrated firm resulting from the merger must have a significant degree of market power in the upstream market. It is only in these circumstances that the merged firm can be expected to have a significant influence on the conditions of

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<sup>78</sup> A specific concern was also raised as regards the supply of cast sticks made of GTD 111, which is a nickel-based alloy over which G.E. holds a US patent. A market player argued that US-based cast stick suppliers are bound by the patent for their EEA sales and can thus only sell GTD 111 cast sticks to investment casters acting for G.E. equipment suppliers. Being EEA-based, FR's supplies of cast sticks made of GTD 111 alloy will not be restricted in that way. The proposed transaction will allegedly put an end to such leeway and investment casters' access to GTD 111 cast sticks will be foreclosed. The Commission considers, however, that such a concern is unjustified. First, GE has confirmed in the course of the market investigation that the patent covers only US-based production plants, and not EEA-based ones. Second, both FR and Alcoa operate production plants in the EEA. Third, the market player raising the concern has confirmed that it favoured supply of cast sticks at the EEA level.

competition in the upstream market and thus, possibly, on prices and supply conditions in the downstream market.<sup>79</sup>

- (72) The Commission considers that the merged entity will not have the ability to foreclose access to cast sticks.
- (73) First, as set out in section 3.1.3.1, the merged entity will not have a significant degree of market power due to: its limited combined market share on the upstream market(s) for cast sticks, the existence of alternative competitors, the possible counter-strategies of investments casters and OEMs, and the fact that FR is not exercising more influence than its market share suggests.
- (74) Second, respondents to the market investigation indicated that the merged entity will not be able to exercise market power in the upstream cast sticks market(s). Most of the casting companies and OEMs contacted in the course of the market investigation did not express any concern as to the consequences of the proposed transaction on their businesses. Most respondents consider that there are alternative suppliers.<sup>80</sup>
- (75) The Commission's conclusion on the inability by the merged entity to engage in input foreclosure means that the question of whether the merged entity will face incentives to engage in this strategy can ultimately left open. However, for the reasons given below, the Commission also considers that the merged entity is unlikely to have the incentive to engage in input foreclosure.

#### 3.1.3.2.2. Incentive to foreclose

- (76) According to the Non-Horizontal Merger Guidelines, the incentive to foreclose depends on the degree to which foreclosure would be profitable. The vertically integrated firm will take into account how its supplies of inputs to competitors downstream will affect not only the profits of its upstream division, but also of its downstream division. Essentially, the merged entity faces a trade-off between the profit lost in the upstream market due to a reduction of input sales to (actual or potential) rivals and the profit gain, in the short or longer term, from expanding sales downstream or, as the case may be, being able to raise prices to consumers.<sup>81</sup>
- (77) For the reasons set out in paragraphs (78) to (87) below, the Commission considers that the merged entity will not have the incentive to engage in either a complete foreclosure strategy (i.e. the merged entity fully stops supplying independent casting companies) or a partial foreclosure strategy (i.e. the merged entity increases prices of cast sticks to independent casting companies).

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79 Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings ("Non-Horizontal Merger Guidelines"), OJ C 265, 18.10.2008, p. 6, paragraph 35.

80 See for instance replies to Questionnaire Q2 – Customers – Cast sticks, question 30.

81 Non-Horizontal Merger Guidelines, paragraph 40.

3.1.3.2.2.1. *Complete foreclosure strategy*

- (78) The Commission has analysed the profitability of a complete foreclosure strategy by comparing the potential losses in the upstream cast sticks market with the potential gains in the downstream investment casting market.
- (79) As regards potential losses on the upstream market, the Commission considers there is no reason to believe that post-transaction Alcoa will change its own strategy of using excess capacity of its Exeter or Dover facility for external sales. Alcoa's sales strategy has been consistent over the past ten years as regards internal versus external sales of cast sticks produced in its two facilities, namely Alcoa Dover s and Alcoa Exeter<sup>82</sup>. Alcoa Dover Alloy was established to be the primary supplier of cast sticks to the North American Alcoa investment casting foundries. Alcoa Dover Alloy has consistently used [a significant amount] of its cast sticks for internal consumption over the past ten years. Alcoa Exeter Alloy was built in 1975 with the intention of supporting the requirements of Alcoa's investment casting foundries in Europe and Japan. Excess capacity was always used for external sales. Over the past ten years, internal sales have consistently represented [a significant amount] of the total amount of cast sticks sold<sup>83</sup>. [...] Alcoa considers that external sales of cast sticks constitute an important revenue stream for Alcoa Exeter Alloy<sup>84</sup>. Withholding this capacity would, in any event, not be merger specific.
- (80) As for whether Alcoa will have the incentive to stop using FR's cast sticks production for external sales, the Commission considers that Alcoa is unlikely to have such an incentive as: (i) Alcoa would forego significant profits in the upstream market<sup>85</sup>; and (ii) Alcoa would not achieve gains downstream as withholding FR's cast sticks from the market<sup>86</sup> would unlikely impact the price downstream because of the presence of downstream competitors<sup>87</sup> and, Alcoa would not be in a position to absorb internally the cast sticks produced by FR so as to realise gains downstream, in light of the current trends for the demand of cast sticks and of the spare cast sticks capacity of Alcoa.
- (81) First, the expected increase in demand for investment castings for aerospace applications will most likely be offset to a large extent by the reduced demand for alloy intensive IGT products<sup>88</sup>. Alcoa explained that IGT spare parts demand is being negatively impacted by the power market, particularly in Europe, where gas-fired power generation has been negatively impacted by low priced coal and

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82 Response to question 11 of the RFI of 10 October 2014

83 Response to question 11 of the RFI of 10 October 2014.

84 Response to question 11 of RFI of 10 October 2014.

85 FR has always sold 100% of its cast sticks to independent casting companies because it has no downstream casting operations of its own. In 2013, FR made a profit margin of [...] See response to question 1 of RFI of 3 October 2014.

86 As explained in paragraph (55), FR's production capacity accounts for only a very limited part of the total production capacity.

87 See paragraphs (65) and (66).

88 Response to question 16 of RFI of 15 October 2014.

subsidised renewables<sup>89</sup>. The decline in demand for IGT components has important repercussions on the demand for cast sticks since IGT components have large diameters and therefore require significant amounts of input material (i.e. superalloy cast sticks).

- (82) Second, [*description of Alcoa's expansion plans*].
- (83) Third, Alcoa is expecting to have even more spare cast sticks capacity in the near future. [*description of Alcoa's contractual relationship with a third party*]<sup>90</sup>.
- (84) It results from the above that, if, post-transaction, the merged entity were to decide to no longer supply cast sticks to independent casting companies, it would lose gains in the upstream cast sticks market (as explained in paragraphs (79) to (80)), and it would not achieve gains in the downstream investment casting market as it would be unable to absorb internally the production currently sold to independent casting companies (as explained in paragraphs (80) to (83)).

#### 3.1.3.2.2. *Partial foreclosure strategy*

- (85) The Commission has also assessed the profitability of a partial foreclosure strategy by comparing the potential losses in the upstream cast stick market with the potential gains in the downstream investment casting market.
- (86) The Commission considers that increasing the cast stick price charged to independent casting companies would not be a profitable strategy for the merged entity because:
  - a. The merged entity would lose business upstream to its vertically integrated competitors. Following a small but significant increase in the price of cast sticks, independent casting companies would most likely switch away from the merged entity and start buying from the merged entity's competitors which are competing with each other to attract independent cast sticks customers. While Alcoa's external sales accounted for [...] of total cast stick sales in 2013, the vertically integrated competitors PCC and Doncasters supplied 30-50% to third parties in 2013<sup>91</sup>. In addition, as mentioned above in paragraph (47)(46), these vertically integrated competitors have excess capacity.
  - b. The merged entity would unlikely benefit downstream from a price increase as its vertically integrated competitors which are self-supplied<sup>92</sup> (and are therefore unaffected by the upstream price increase) compete downstream and have excess capacity downstream.
- (87) As a consequence, the Commission considers that the merged entity has no incentive to engage in a partial foreclosure strategy.

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<sup>89</sup> Response to question 16 of RFI of 15 October 2014.

<sup>90</sup> Response to question 12 of RFI of 15 October 2014.

<sup>91</sup> Substantive Assessment submitted on 23 October 2014, paragraph 39.

<sup>92</sup> This would include Chromalloy who will start self-supplying as of 2015, see paragraph (60) above.

### 3.1.3.2.3. Conclusion

- (88) Based on the above, the Commission considers that the merged entity does not have the ability and is also unlikely to have the incentive to engage in a complete or partial input foreclosure strategy. The Commission therefore considers that the proposed transaction does not raise serious doubts as to its compatibility with the internal market with respect to the vertical relationship between the Parties' activities in nickel- and cobalt-based cast sticks and investment castings.

## 3.2. Aluminium alloys/Forged rings

### 3.2.1. *The Parties' activities*

- (89) Alcoa produces and sells aluminium alloys in billet form. FR purchases aluminium alloys in billet form for the production of aluminium-based forged rings. More precisely, FR sources the aluminium alloys [C, D, E, A, B and F] in billets.<sup>93</sup> Alcoa sells aluminium alloys [A, C, D, B and F], but only alloys [A and B] are sold in billet form. The other alloys are sold in ingot form.

### 3.2.2. *Market definition – Aluminium alloys*

- (90) In previous decisions,<sup>94</sup> the Commission has distinguished between primary aluminium products (i.e. produced by smelting alumina) and secondary aluminium products (i.e. produced by re-melting and re-converting used aluminium products). Moreover, the Commission has considered that standard primary aluminium may be further segmented on the basis of its shape into (i) standard ingots/T-bars, (ii) extrusion billets, (iii) rolling slabs, (iv) wire rod and (v) foundry alloys.<sup>95</sup> As regards the geographic scope of these markets, the Commission has considered that they are worldwide.<sup>96</sup>
- (91) The Parties submit that in the present case there is no need to distinguish between the various aluminium alloys and/or forms of aluminium alloys and that the precise market definition can be left open.<sup>97</sup> The Parties submit that the relevant geographic market is worldwide in scope.
- (92) A majority of respondents to the market investigation indicated that there is limited supply-side and demand-side substitutability between alloys in ingot and billet form.<sup>98</sup> There is limited demand-side substitutability between the different types or groups of

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<sup>93</sup> Source: Form CO, paragraph 225.

<sup>94</sup> See e.g. Case M.4827, Rio Tinto/Alcan and M.7019 – Trimet/EDF/NewCO.

<sup>95</sup> See e.g. Case M.4441, EN+ / Glencore / Sual / UC Rusal and M.7019 – Trimet/EDF/NewCO.

<sup>96</sup> See e.g. Case M.7019 – Trimet/EDF/NewCO, paragraph 25.

<sup>97</sup> Form CO, paragraph 87-89.

<sup>98</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, questions 6 and 8. See replies to Questionnaire Q3 for competitors – aluminium, question 8, 9 and 10.

alloys although from the supply-side perspective, alloy manufacturers do not generally specialise in one type or group of alloys.<sup>99</sup>

- (93) A majority of respondents to the market investigation also show that, at least from the demand-side, alloys based on secondary aluminium (i.e. re-melted aluminium) are to a certain extent substitutable for alloys based on primary aluminium.<sup>100</sup> According to the replies to the market investigation, alloys are mostly supplied and sourced at worldwide level<sup>101</sup> even if there are price differences between certain regions (EEA, North America, Asia).<sup>102</sup>
- (94) For the purpose of the present case, the precise product and geographic market definition can be left open because the proposed transaction does not raise serious doubts as to its compatibility with the internal market regardless of the exact market definition.

### 3.2.3. *Market definition – Forged Rings*

- (95) In previous decisions analysing forged rings,<sup>103</sup> the Commission considered that a segmentation based on the manufacturing process of forged rings, namely seamless forging process (which essentially consists in punching a hole in a thick metal disc) and by flash welding (which is the bending of a metal bar and welding of the two ends of the bar) could be appropriate, although it ultimately left open the precise product market definition. As for geographic scope, the Commission found that these markets are global.
- (96) The Parties submit that a further segmentation could be based on the metal type used to produce the different forged parts. However, the Parties consider that the precise market definition in relation to seamless rings can be left open. In line with the Commission's precedents, the Parties submit that these markets are global.<sup>104</sup>
- (97) As regards forged rings, a majority of respondents to the market investigation suggested that seamless rolled rings and flash welded rings do not belong to the same product market due to the limited supply-side and demand-side substitutability.<sup>105</sup> A

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<sup>99</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, questions 9, 10. See replies to Questionnaire Q3 for competitors – aluminium, question 12.

<sup>100</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, question 11. See replies to Questionnaire Q3 for competitors – aluminium, questions 6 and 7.

<sup>101</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, question 16. See replies to Questionnaire Q3 for competitors – aluminium, question 13

<sup>102</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, question 17. See replies to Questionnaire Q3 for competitors – aluminium, question 14.

<sup>103</sup> Case M.4561 - GE/Smiths Aerospace, paragraph 37-46.

<sup>104</sup> Form CO, paragraph 96 – 105.

<sup>105</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, questions 12, 13, 14 and 15.

majority of respondents to the market investigation also indicated that the relevant geographic market is worldwide.<sup>106</sup>

- (98) For the purpose of the present case, the precise product and geographic market definition can be left open because the proposed transaction does not raise serious doubts as to its compatibility with the internal market regardless of the exact market definition.

#### 3.2.4. *Competitive assessment*

- (99) There is no actual vertical link between the Parties as FR does not source aluminium alloys in the form of billets from Alcoa. The transaction gives rise only to a potential vertical link in relation to two alloys, namely [alloy A] and [alloy B] ("the two alloys"), which are bought by FR in billet form and supplied also by Alcoa in billet form.
- (100) Alcoa's share of a potential upstream market for all types of aluminium-based alloys in the form of billets was [10-20]% in 2013 at the worldwide level:

**Table 6: Competitive landscape of the worldwide market for aluminium-based alloys in the form of billets – Form CO**

<b>Market shares in aluminium-based alloys in the form of billets (2013)</b>	
<b>Company</b>	<b>Market share - Worldwide</b>
Emirates Global Aluminium	[20-30]%
Hydro	[10-20]%
<b>Alcoa</b>	<b>[10-20]%</b>
Rusal	[10-20]%%
Rio Tinto Alcan	[10-20]%%
Aluminium Bahrain	[10-20]%%
Vedanta	[0-5]%
Century	[0-5]%
<b>Total</b>	<b>100%</b>

- (101) Even in hypothetical markets defined by alloy type, Alcoa's share in 2013 would have remained below [0-5]% respectively at EEA and worldwide level for each of the two alloys.<sup>107</sup>
- (102) FR had market shares up to [40-50]% in the different potential downstream products markets for forged rings in 2013 at the worldwide level.<sup>108</sup>

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<sup>106</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, questions 18 and 19.

<sup>107</sup> Replies to question 1 of RFI of 22 October 2014; question 4 of 27 October 2014 and question 3 of RFI of 30 October 2014.

<sup>108</sup> The Parties have not been able to provide market shares for aluminium-based forged rings only. They submit, however, that their combined 2013 market shares would be similar in that potential sub-market.



**Table 7: Competitive landscape of the worldwide market for forged rings (all metals) – Form CO**

Market shares in forged rings (all metals) – Worldwide (2013)									
Company	Forged rings			Seamless rolled rings			Flash-welded rings		
	All <sup>109</sup>	AS <sup>110</sup>	IGT	All	AS	IGT	All	AS	IGT
<b>FR</b>	<b>[30-40]%</b>	<b>[30-40]%</b>	<b>[20-30]%</b>	<b>[40-50]%</b>	<b>[40-50]%</b>	<b>[20-30]%</b>	<b>[0-5]%</b>	<b>[0-5]%</b>	<b>[0-5]%</b>
PCC	[30-40]%	[30-40]%	[10-20]%	[20-30]%	[30-40]%	[5-10]%	[60-70]%	[60-70]%	[40-50]%
Forgital	[5-10]%	[5-10]%	[5-10]%	[5-10]%	[5-10]%	[10-20]%	[0-5]%	[0-5]%	[0-5]%
Frisa	[5-10]%	[5-10]%	[20-30]%	[5-10]%	[5-10]%	[30-40]%	[0-5]%	[0-5]%	[0-5]%
Doncasters	[0-5]%	[0-5]%	[10-20]%	[0-5]%	[0-5]%	[10-20]%	[0-5]%	[0-5]%	[0-5]%
Mattco	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%
Anda	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%
Welded Ring	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[0-5]%	[5-10]%	[10-20]0%	[0-5]%
Others	[10-20]%	[10-20]%	[20-30]%	[5-10]%	[5-10]%	[10-20]%	[20-30]%	[5-10]%	[50-60]%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100</b>

- (103) Based on the Parties' estimates, Alcoa accounted in 2013 for a [10-20]% share of the total market for aluminium billets. In 2013, Alcoa's sales of the two alloys represented about [10-20]% of Alcoa's overall sales of aluminium billets.<sup>111</sup>
- (104) For the reasons set out below, the Commission considers that the merged entity will not have the ability to foreclose access to aluminium-based alloys in billet form.
- (105) First, there will be at least five alternative suppliers of aluminium billets with at least 10% market share each post-transaction. As shown in Table 6 and 7, none of the major alternative suppliers of aluminium-based alloys in the form of billets appears to be vertically integrated downstream in the production of forged rings.
- (106) Second, a majority of respondents to the market investigation indicated that post-transaction there will continue to be a number of alternative suppliers of aluminium billets, such as Vista Metals, Rio Tinto Alcan, Alba, Kaiser Aluminium and Hydro.<sup>112</sup> All the customers of aluminium billets that replied to the market investigation indicated that they currently multisource from several suppliers.<sup>113</sup>

<sup>109</sup> All refers to all applications.

<sup>110</sup> AS refers to aerospace.

<sup>111</sup> Response to question 1 of RFI of 22 October 2014, annex Q1. Form CO, paragraph 227-228.

<sup>112</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, question 23.

<sup>113</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, question 5.1 and 21.

- (107) Third, while certain respondents to the market investigation suggested that switching might not be easy when only one supplier of aluminium is certified by the customer<sup>114</sup> or in relation to certain sectors, such as aerospace and space markets, where switching might be longer and more costly than in other industrial markets,<sup>115</sup> the vast majority of customers considered that switching can happen quickly and does not entail significant costs.<sup>116</sup>
- (108) There will therefore be sufficient alternative suppliers of aluminium-based alloys in the form of billets to counter-act any input foreclosure strategy pursued by the merged entity.
- (109) Even when considering narrower hypothetical markets defined by individual aluminium-based alloys, an input foreclosure strategy is unlikely. As explained in paragraph (101), Alcoa's market shares in 2013 in the hypothetical markets for [alloy A] and [alloy B] were insignificant and several alternative suppliers will remain on these markets.
- (110) If a broader market for billets and ingots were to be considered, there would be a potential vertical relationship regarding alloys [C, D and F] that are sold by Alcoa in ingot form and purchased by FR in billet form. However, this vertical relationship would not lead to any input foreclosure concern because of Alcoa's limited market share in each of these alloys.<sup>117</sup> In addition, a number of alternative suppliers will remain on these markets.
- (111) Finally, a large majority of respondents to the market investigation did not consider that the proposed acquisition will raise competition concerns<sup>118</sup> because alternative suppliers of aluminium-based alloys in the form of billets will remain<sup>119</sup> (making potential input foreclosure unlikely) and because FR's purchases of aluminium-based alloys are of limited significance on the overall market<sup>120</sup> (making potential customer foreclosure unlikely).
- (112) Based on the above, the Commission therefore considers that the proposed transaction does not raise serious doubts as to its compatibility with the internal market with respect to the vertical relationship between the Parties' activities in aluminium alloys and forged rings.

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<sup>114</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, question 22.1.

<sup>115</sup> See replies Questionnaire Q4 for customers of aluminium-based alloys in billet form, question 22.1.

<sup>116</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, question 22.

<sup>117</sup> Alcoa's market share for alloys [C] and [F] would have been below [0-5]% and [5-10]% at the EEA and worldwide level respectively. Alcoa's market share for [alloy D] would have been below [5-10]% and [0-5]% at the EEA and worldwide level respectively. See replies to RFI of 22 October 2014 and RFI of 30 October 2014.

<sup>118</sup> See replies to Questionnaire Q3 for competitors – aluminium, questions 16, 17 and 18. See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, question 26.

<sup>119</sup> See replies to Questionnaire Q4 for customers of aluminium-based alloys in billet form, questions 23

<sup>120</sup> In 2013, FR's total purchases of all aluminium-based alloys in billet form amounted to approximately [...] metric tons which according to Alcoa's internal estimates represented less than [0-5]% of the worldwide sales of all aluminium-based alloys in billet form. Source: Form CO, paragraph 230.

#### **4. CONCLUSION**

- (113) For the above reasons, the European Commission has decided not to oppose the notified operation and to declare it compatible with the internal market and with the EEA Agreement. This decision is adopted in application of Article 6(1)(b) of the Merger Regulation.

*For the Commission  
(signed)*

*Margrethe VESTAGER  
Member of the Commission*