



# DETERMINATION OF MERGER NOTIFICATION M/20/028 APPLIED MATERIALS INC – KOKUSAI ELECTRIC CORPORATION

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## Section 21 of the Competition Act 2002

**Proposed acquisition by Applied Materials, Inc. of sole control of Kokusai Electric Corporation.**

**Dated 9 October 2020**

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### **Introduction**

1. On 21 September 2020, in accordance with section 18(1)(a) of the Competition Act 2002, as amended (the “Act”), the Competition and Consumer Protection Commission (the “Commission”) received a notification of a proposed acquisition whereby Applied Materials, Inc. (“Applied Materials”) would acquire sole control of Kokusai Electric Corporation (“Kokusai”) (the “Proposed Transaction”).

### **The Proposed Transaction**

2. The Proposed Transaction is to be implemented pursuant to a share purchase agreement dated 30 June 2019 between Applied Materials, Kokusai and KKR HKE Investment L.P., which owns and controls Kokusai (together, the “Parties”). Following implementation of the Proposed Transaction, Applied Materials would have sole control of Kokusai.



### Reason for re-notification

3. The Proposed Transaction was previously notified to the Commission on 3 September 2019 and cleared by the Commission on 11 October 2019 in accordance with section 21(2)(a) of the Act (Determination M/19/027 Applied Materials / Kokusai).<sup>1</sup>
4. Section 19(3) of the Act provides that a determination made by the Commission pursuant to section 21 or 22 of the Act that a merger or acquisition notified to it may be put into effect shall not operate to permit such merger or acquisition to be put into effect if the merger or acquisition is not put into effect before the expiry of the period of 12 months after the date on which the determination is made. The Parties have stated to the Commission that the Proposed Transaction is still awaiting clearance from the Chinese competition authority, the State Administration for Market Regulation (“SAMR”).<sup>2</sup> The Parties informed the Commission that clearance by SAMR of the Proposed Transaction is a necessary step for completion of the Proposed Transaction.
5. While the Parties have informed the Commission that they plan to complete the Proposed Transaction as soon as possible after clearance is received from SAMR, they are mindful that the clearance granted by the Commission’s determination of 11 October 2019 in respect of the Proposed Transaction is set to expire by 11 October 2020 in accordance with section 19(3) of the Act. Accordingly, the Parties re-notified the Proposed Transaction to the Commission on 21 September 2020.

### The Undertakings Involved

#### *The Acquirer – Applied Materials*

6. Applied Materials is based in Santa Clara, California and is quoted on the NASDAQ stock market.<sup>3</sup> Applied Materials operates in a number of locations around the world including Europe, Japan, the United States of America, Israel, China, India, southeast Asia and Japan.

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<sup>1</sup> [https://www.cpc.ie/business/wp-content/uploads/sites/3/2019/09/M-19-027-Applied-Materials-Kokusai\\_Public.pdf](https://www.cpc.ie/business/wp-content/uploads/sites/3/2019/09/M-19-027-Applied-Materials-Kokusai_Public.pdf)

<sup>2</sup> Further details of SAMR are available from its website at: <http://www.samr.gov.cn/>

<sup>3</sup> Further details of Applied Materials’ NASDAQ stock market listing are available from: <https://www.nasdaq.com/market-activity/stocks/amat>



7. Applied Materials provides manufacturing equipment, services and software to the semiconductor, display and related industries. Applied Materials' semiconductor products include wafer fabrication equipment ("WFE") which is used to perform certain steps in the semiconductor fabrication process including non-furnace atomic level deposition ("ALD") and chemical vapour deposition ("CVD") as well as other processes.
8. Applied Materials does not manufacture any products in the State and its activities in the State are limited to the distribution, installation and maintenance of, and after-sales services for (i) non-furnace deposition tools and (ii) wafer-level packaging tools. Applied Materials currently has [...] in the State, namely [...].
9. For the financial year ending 31 December 2019, Applied Materials generated worldwide turnover of approximately €[...]billion, of which approximately €[...]million was generated in the State.

#### *The Target – Kokusai*

10. Kokusai is a privately-owned company and is based in Tokyo, Japan. Kokusai is wholly-owned by KKR HKE Investment L.P., which is indirectly controlled by KKR & Co. Inc./KKR Management LLC ("KKR"). KKR is a global asset manager which offers a broad range of alternative asset management services to public and private investors. KKR acquired Kokusai in 2017.
11. Kokusai supplies WFE tools, including furnace ALD and CVD tools used in the deposition of furnace oxidation/diffusion tools, representing over [...] of its worldwide WFE sales. Kokusai also offers support services for its own tools, including parts, alterations and intellectual property licensing to suppliers.
12. In the State, Kokusai's activities are limited to the distribution, installation and maintenance of, and after sales service for furnace deposition tools to its [...].
13. For the financial year ending 31 March 2020, Kokusai generated worldwide turnover of approximately €[...]billion, of which approximately €[...]million was generated in the State.



### **Rationale for the Proposed Transaction**

14. The Parties state in the notification:

*“The purpose of the Proposed Transaction is to enable [Applied Materials] to leverage [Kokusai’s] technologies products, and expertise to enhance innovation, accelerate R&D, and provide solutions for customers in a growing furnace tool market.”*

### **Market Enquiries**

15. During its investigation, the Commission contacted Kokusai’s [...] in the State, [...], with respect to the Proposed Transaction. [...] did not indicate to the Commission that it had any competition concerns in respect of the Proposed Transaction.

### **Third Party Submissions**

16. No submission was received.

### **Competitive Analysis**

#### *Horizontal overlap*

17. Globally, the Parties are both active in the supply of WFE tools. However, the Parties submit that, for the reasons set out below, the Proposed Transaction would not give rise to any horizontal overlaps in the supply of WFE tools either globally (with one exception) or in the State, since the Parties supply different WFE tools, which are not substitutable and do not compete.

18. Semiconductor chips are built on “wafers,” or thin slices of silicon, using hundreds of sequential steps and a variety of tools. WFE is an extremely broad industry category that includes a wide range of tools used for different applications during different steps of the semiconductor manufacturing process.

19. Those steps include depositing material on the wafer (“deposition”), removing material from the wafer (“etching”, “cleaning” and “stripping”), quickly heating and cooling the wafer (“rapid thermal processing”), and exposing the wafer to ionized gases such as



nitrogen (“integrated plasma treatment”) and oxygen (“non-integrated plasma treatment”). After the wafer has been fabricated, it is packaged and cut into individual chips (“packaging” and “dicing”), which are then used in electronic devices.

20. There are different types of deposition tools used for different materials being deposited, the available thermal budget and the stage of the wafer fabrication process.
21. The Parties state that the deposition tools that each of the Parties offer are not substitutes for one another and do not compete with each other for the following reasons:
- The only kind of deposition tool Kokusai offers is the furnace CVD and ALD tool. Furnace CVD and ALD tools perform chemical vapour deposition and atomic layer deposition in a large chamber on up to 50-150 wafers simultaneously. Each wafer is treated by the same precursor at the same time in the same chamber, and
  - Applied Materials does not offer any furnace deposition tools or in particular, furnace CVD and ALD tools, and focuses exclusively on non-furnace CVD and ALD tools, which treat wafers individually.
22. Table 1 below shows the area of overlap in the WFE tools supplied by the Parties and the global revenue generated from each WFE product. Table 1 shows there is one area of overlap at global level, i.e. Rapid Thermal Processing (RTP).

**Table 1: Parties’ 2018 Wafer Fabrication Equipment Revenue by Segment**

WFE segment	2018 Revenue (US\$M) <sup>4</sup>	
	Applied Materials	Kokusai
<i>Deposition</i>		

<sup>4</sup> Data supplied to the Commission from Gartner, Inc. (a research and advisory firm providing information, advice, and tools for businesses in IT, finance, HR, customer service and support) by the Parties.



WFE segment	2018 Revenue (US\$M) <sup>4</sup>	
	Applied Materials	Kokusai
Furnace (CVD) and (ALD) Tools	0	\$[...]
Non-Furnace CVD and ALD Tools	\$[...]	0
Epitaxy Tools	\$[...]	0
Physical Vapour Deposition (PVD) Tools	\$[...]	0
Electro-Chemical Deposition (ECD) Tools	\$[...]	0
<i>Thermal Processing</i>		
RTP	\$[...]	\$[...]
Furnace Oxidation/Diffusion	0	\$[...]
<i>Plasma Treatment</i>		
Non-Integrated Plasma Treatment Tools	0	\$[...]
Integrated Plasma Treatment Tools	\$[...]	0
<i>Material Removal and Cleaning</i>		
Dry Etch	\$[...]	0
Chemical Mechanical Planarization (CMP) and Post-CMP Clean	\$[...]	0
Dry Strip	0	\$[...]
<i>Process Control</i>		
Process Control	\$[...]	0
<i>Other</i>		



WFE segment	2018 Revenue (US\$M) <sup>4</sup>	
	Applied Materials	Kokusai
Lithography	\$[...]	0
Doping Equipment	\$[...]	0
Manufacturing Automation and Control	\$[...]	0
<i>Total</i>		
Total Wafer Fabrication Equipment	\$[...]	\$[...]

Source: Gartner Calendar Year 2018 Data

#### *Competitive Assessment*

23. The Commission defines markets to the extent necessary depending on the particular circumstances of a given case. In this case, it is not necessary for the Commission to conclude on the relevant product markets in respect of WFE tools, as regardless of whether the potential product markets are defined narrowly (CVD and ALD tools) or more broadly (all WFE tools), the Proposed Transaction is unlikely to raise any horizontal competition concerns.
24. Similarly, with respect to the relevant geographic market, , it is not necessary for the Commission to conclude on the relevant geographic market in this case, as, regardless of whether the potential geographic market is defined narrowly (i.e., the State) or more broadly (i.e., worldwide), the Proposed Transaction is unlikely to raise any horizontal competition concerns.
25. The Parties are both active in the supply of WFE tools globally but they state that their products are not substitutable. In particular, the Parties submit that there are differences between furnace and non-furnace CVD and ALD tools in terms of costs and uses. For example:



- Furnace tools are relatively cheap (from US\$[...] to US\$[...]) and can process many wafers at a time (typically 100 to 175 in a single chamber) at relatively high temperatures (~800°C).
  - Non-furnace tools are generally more expensive (from US\$[...] to US\$[...]) on a per wafer pass basis and process only a few wafers at a time (one to two in a single chamber for single-wafer tools and up to six in a single chamber for spatial tools) at relatively low temperatures (~400°C).
26. As shown in Table 1, globally, Kokusai only supplies furnace CVD and ALD tools. In contrast, globally, Applied Materials supplies a number of different types of deposition tools, including non-furnace CVD and ALD tools.
27. The Commission does not consider that there is a horizontal overlap between the Parties' activities in the State, as Applied Materials supplies [...] in the State and Kokusai supplies [...] in the State. Applied Materials does not supply any furnace CVD and ALD tools to customers in the State. While Applied Materials supplies [...] in the State, [...], Kokusai does not supply these products in the State.
28. The Commission notes that there is a non-material overlap between the Parties (approximately a [0-5]% increase in the Parties' pre-transaction shares) globally in the supply of RTP tools.<sup>5</sup>
29. In light of the above, the Commission considers that the Proposed Transaction does not raise any horizontal competition concerns with respect to the supply of WFE tools either globally or in the State.

#### *Vertical overlap*

30. The Parties have stated in the notification that there is no vertical relationship between Applied Materials and Kokusai. The Commission has not identified any vertical relationship between the Parties in the State. On this basis, the Commission considers

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<sup>5</sup> Parties' own estimate based on revenues generated in the supply of RTP tools in 2019.



that the Proposed Transaction does not raise any vertical competition concerns in the State.

### **Conclusion**

31. In light of the above, the Commission considers that the Proposed Transaction will not substantially lessen competition in any market for goods or services in the State.

### **Ancillary Restraints**

32. No ancillary restraints were notified.



### **Determination**

The Competition and Consumer Protection Commission, in accordance with section 21(2)(a) of the Competition Act 2002, as amended, has determined that, in its opinion, the result of the proposed acquisition whereby Applied Materials, Inc. would acquire sole control of Kokusai Electric Corporation, will not be to substantially lessen competition in any market for goods or services in the State, and, accordingly, that the acquisition may be put into effect.

For the Competition and Consumer Protection Commission

**Brian McHugh**  
**Member**  
**Competition and Consumer Protection Commission**