



Competition
Commission
S I N G A P O R E

Section 57 of the Competition Act (Cap. 50B)

Grounds of Decision issued by the Commission

Notification for Decision: Anticipated Merger Involving Acquisition by Chartered Semiconductor Manufacturing Ltd of Hitachi Semiconductor Singapore Pte Ltd

28 March 2008

Case number: CCS 400/008/08

Confidential information in the original version of this Decision has been redacted from the published version on the public register. Redacted confidential information in the text of the published version of the Decision is denoted by [X].

I. INTRODUCTION

1. On 21 February 2008, the Commission received a notification for decision pertaining to an anticipated merger, involving the acquisition of Hitachi Semiconductor Singapore Pte Ltd (“HNS”) by Chartered Semiconductor Manufacturing Ltd (“Chartered”) (collectively referred to as “the parties”).
2. The Commission has concluded that the notified merger, if carried into effect, will not infringe the section 54 prohibition.

II. THE PARTIES

3. Chartered is a limited liability company incorporated in Singapore and listed on the Singapore Stock Exchange and the NASDAQ Global Select Market. Chartered is a semiconductor foundry providing wafer fabrication services and technologies to customers in the communication, computer and consumer sectors.
4. HNS provides foundry services to semiconductor manufacturers with process technologies ranging from 130 nm to 350 nm and offers testing services in parametric, logic function, memory and laser repair. The HNS plant possesses capability to fabricate 200mm wafers.

III. THE MERGER

5. The merger is a cash transaction for the purchase of 100% of shares of HNS, from Hitachi Ltd and Hitachi Asia Ltd, by Chartered. The merger is expected to be completed on 31 March 2008 and is subject to the Commission issuing a favourable decision that the purchase and sale of the shares does not violate the section 54 prohibition.

IV. RELEVANT MARKETS

Product market

Parties' submission

6. The parties submit that the relevant product market is the market for the provision of foundry services to semiconductor companies, as both Chartered and HNS operate in this market.

7. The parties submit that it is not necessary to further separate the market for the provision of foundry services according to the specific types of wafer size (i.e. 200mm or 300mm). They note that wafer size is dictated primarily by technology, and improvements in technology result in more advanced versions of wafers being introduced every three to five years. The parties further submit that none of the research studies cited in their notification divided the market according to wafer size.

8. The parties further submit that it is only a leading edge technology node¹ that enables a firm to capture a bigger market and have the greatest impact on future growth. Hence, even if the market is defined according to wafer size, the parties point out that HNS manufactures 200mm wafers, which are technologically inferior to 300mm wafers, and which are unlikely to provide such an advantage to Chartered even if a separate market for 200mm wafers is established. The parties also note that supply-side substitutability between wafers of different sizes, although technically feasible and currently takes place in the industry to varying degrees, is not cost effective and is generally limited. The parties also note that demand-side substitutability between 200mm and 300mm is limited generally to devices with line width between 130nm to 90nm.

¹ According to the parties, the technology node is typically described by the technology scaling factor utilised in production. One of the key parameters that characterises a technology node is the transistor gate length, sometimes simply referred to as the linewidth. A transistor is in turn the basic element in an electronic circuit, and comprises the gate, the source and the drain. The gate length is the distance between the source and the drain. With improvements in technology, the linewidth characterizing the technology node gets progressively smaller.

Commission's assessment

9. The Commission's inquiries revealed that foundries largely provide semiconductor manufacturing services, and that foundries' manufacturing capabilities are determined by the availability of technology and capacity and customers' demand.

10. The Commission also examined whether narrower product market definitions could be arrived at, by:

- a. separating the product market according to wafer size, i.e. with 200mm wafers and 300mm wafers each forming a separate product market; or alternatively
- b. (following respondents' comments pertaining to technology nodes) separating the product market according to the technology node, i.e. wafers with different technology nodes (such as 90nm, 130nm, etc) forming separate product markets.

11. In addition, the Commission also noted that integrated device manufacturers ("IDMs")², like foundries, also possess semiconductor manufacturing capability. Given that the parties only provide foundry services, a product market definition including services of IDMs would be wider than if the product market definition was limited to the provision of foundry services alone. However, the Commission found that competition concerns would not arise in the narrower market definition (i.e. provision of foundry services), so that there is no need to determine precisely whether IDMs should be included as part of the relevant product market.

12. Having found no competition concerns (as explained in subsequent paragraphs) in any of the alternative product market definitions described in the preceding paragraphs, the Commission considers it unnecessary to define the product market precisely in this case.

Geographic market

Parties' submission

13. The parties claim that the relevant geographic market definition for the provision of foundry services to semiconductor companies should be worldwide. They note that there are no quotas, tariffs or technical specifications that pose as barriers to transportation. There are no significant price differences between countries, and transport costs are generally low. In addition, there is no need for a local presence in order to provide foundry services locally. The parties submit that

² IDMs are companies which have the facilities to handle the whole process of producing the semiconductors in-house (i.e. they own the circuit design, wafer fabrication plants and the backroom packaging knowledge). IDMs may also engage foundries in production.

this geographic market definition can be supported by the fact that the parties' competitors and customers are based all over the world.

Commission's assessment

14. The Commission's market investigations supported the parties' claims of a worldwide geographic market. Customers of foundry services typically do not view the location of the supplier as an important factor, and are generally prepared to consider foundries irrespective of the location of the foundry. Transportation costs do not appear to be significant in comparison to the value of the products. As such, the Commission is of the view that the relevant geographic market for the provision of foundry services is worldwide. This is supported by the fact that the bulk of Chartered's revenue is accounted for by customers headquartered outside of Singapore.³

V. COMPETITION ASSESSMENT

Market concentration

15. **Table 1** below shows the worldwide market share figures of the four largest foundry players in 2006. Post-merger market shares and concentration ratios of the three largest firms (CR3), under each of the alternative product market definitions, fall below the indicative thresholds in the CCS Guidelines. The parties also submit that there is a possibility of increasing HNS' capacity post-merger to 30,000 200mm wafers or more per month, within a year post-merger. Should this take place, this would raise the post-merger market share to about 8.4% or more. The Commission considers that this increase does not materially affect the assessment.

Table 1: Worldwide market shares (%), 2006

As a share of the market of	Chartered	HNS	Chartered and HNS	TSMC ¹	UMC ²	SMIC ³
By revenue						
All foundries ⁴	7.4	1.1	8.5	46.8	14.7	6.8
By wafer size						
Wafer size 200mm	7	1.1 ⁵	8.1	27	16	7
Wafer size 300mm	7	0	7	45	26	11

Source: i) HSBC "Global Technology Report Silicon Backbone", March 2007, pages 21-22
ii) the parties' submission

Notes: ¹ Taiwan Semiconductor Manufacturing Company Ltd
² United Microelectronics Corporation
³ Semiconductor Manufacturing International Corporation
⁴ Figures for 1H06
⁵ Based on capacity of 24,000 wafers per month for 2007

³ The parties stated that 77% of Chartered's global turnover is accounted for by customers headquartered in United States, 9% by customers headquartered in Europe, 9% by customers headquartered in Asia Pacific (excluding Singapore), and 2 % by customers headquartered in Japan. Customers headquartered in Singapore account for 3% of Chartered's global turnover.

16. In addition, the Commission estimated the market concentration for separate product markets by technology node (as shown in **Table 2**). In this regard, the Commission examined only the markets for 180nm and 350nm technology nodes, as these are the only technology nodes employed by HNS currently. Post-merger market shares and CR3 ratios under each of the alternative product market definitions, fall below the indicative thresholds in the CCS Guidelines.

Table 2: Worldwide market shares (%) by revenue, 2006*

As a share of the market of	Chartered	HNS	Chartered and HNS	TSMC	UMC	SMIC
Technology node 180nm	2.5	[10-20]	[10-20]	45.0	15.0	10.0
Technology node 350nm	8.6	[0-10]	[0-10]	36.1	30.1	3.4

Note: * Estimated from HSBC "Global Technology Report Silicon Backbone", March 2007, page 23, and based on assumption that revenue of 4 largest foundries (i.e. TSMC, UMC, Chartered and SMIC) accounts for about 70% of total worldwide foundries' revenue (page 1 of same report).

Non-coordinated effects

17. As seen in **Tables 1 and 2**, the parties' post merger market shares are fairly low and fall well below the indicative thresholds in the CCS Guidelines. The Commission also did not receive any concerns of non-coordinated effects from respondents; instead, one respondent noted that the merger could improve the Chartered's cost competitiveness. Hence the Commission is of the view that the merger is unlikely to give rise to non-coordinated effects.

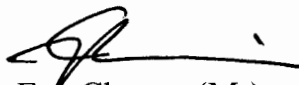
Coordinated effects

18. Comments from third parties indicated fierce competition among the different foundries. Industry reports also show that average semiconductor price level has fallen consistently every year. The Commission's investigations further indicated that there is a high degree of product differentiation, as each foundry uses different technology and processes to fabricate wafers, resulting in a difference in the wafer yield and quality of the manufactured semiconductors. Based on these factors and the market shares shown in the table, the Commission is of the view that the merger is unlikely to result in coordinated effects.

VI. CONCLUSION

19. For the reasons stated above and based on the information available to the Commission, the Commission has assessed that the proposed merger, if carried into effect, will not infringe the section 54 prohibition.

20. In accordance with section 57(7) of the Competition Act, this decision shall be valid for a period of 1 year from the date of this decision.

A handwritten signature in black ink, appearing to be 'Teo Eng Cheong', written over a horizontal line.

Teo Eng Cheong (Mr)
Chief Executive
Competition Commission of Singapore