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Global and China Wafer Foundry Industry Report, 2010

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Abstracts

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The year of 2010 has been the best year for wafer foundry industry since 2000. It is expected that the output value of wafer foundry industry will reach USD27.6 billion, up 37.8% year-on-year. In addition, the output value of the entire semiconductor industry is projected to achieve USD274.5 billion, rising 21.5% year-on-year.

The wafer foundry industry witnessed a prosperous development in 2010, as a result of the economic recovery and the fab-lite strategy adopted by many large semiconductor companies. Most of the companies have continued to use existing fabs or produce analog products in their own fabs instead of investing in new fabs, while outsourcing the advanced digital CMOS process to wafer foundries because the R&D of processes at 65-nm and below that requires a huge amount of capital and labor force is unaffordable even to large semiconductor companies. For example, TI announced to outsource the production of the products at 32-nm and below to TSMC. Renesas, Japan's biggest semiconductor manufacturer, also announced to outsource the production of its future top-class products to TSMC in July 2010. Thus, the wafer foundry industry will see a higher average growth margin than that of the semiconductor industry in the future. In the meantime, the wafer foundry industry also substantially increased the capital expenditure to improve technology and capacity in 2010. The capital expenditure of TSMC, UMC and Global Foundries will be as high as USD5.9 billion, USD1.9 billion and around USD2.5 billion respectively in 2010, all tripling the figures in 2009.

In 2010, there were some big changes in the wafer foundry industry. Global Foundries

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(GF), the wafer foundry originated from AMD, became increasingly strong after acquiring Chartered Semiconductor. The emergence of GF ended the competitive structure formed by TSMC, UMC, Chartered Semiconductor and SMIC. SMIC had been lagged far behind, and the operating income was only half of GF's, and its technology was much inferior to GF's as well. As a result, the wafer foundry industry is being dominated by GF, UMC and TMSC. UMC is facing the powerful challenge from GF, and even TMSC dare not underestimate GF.

Nevertheless, it is not easy for GF to surpass UMC as well. Firstly, Chartered Semiconductor acquired by GF had delivered poor performance all the while, and suffered net losses of USD288 million in 2009, while UMC achieved an operating profit margin of 5.1% in 2009. In 2009Q3, the capacity utilization of Chartered Semiconductor was 75%, while UMC's was 89%. Originally led by Temasek, a sovereign wealth fund of the Singapore government, Chartered Semiconductor has been operating with low efficiency and suffered losses since its establishment. SMIC has suffered losses for main businesses for 13 consecutive quarters and five years. Chartered Semiconductor has not done better than SMIC. UMC has operated much better, and gained profit for five consecutive years. It will take GF a long time to transform Chartered Semiconductor into an efficient enterprise.

Secondly, GF cannot compete with UMC in terms of technology and capacity. UMC is capable of producing 4.8 million wafers annually, GF's Chartered Semiconductor has an annual capacity of around 1.9 million wafers, plus the capacity of the former AMD, GF's capacity is estimated to be 3.5-3.8 million wafers in total. Although backed up by Abu Dhabi, GF still needs time to increase capacity, since its new plant under construction in the United States since 2009 won't be put into production until 2012.

Finally, GF has a narrower range of clients, because it should give priority to AMD, its parent company and also its biggest client, which may make other clients discontented. Chartered Semiconductor is a member of IBM technology alliance, so the majority of its big clients are from the alliance as well. UMC is the world's first wafer foundry, treating all clients equally regardless of size and background.

During its 23 years of development, TSMC has never got an operating profit margin below 20% and a gross margin below 30%, and it has topped the market all the time. Its leadership has remained unshakable so far. Its annual capacity of 11 million wafers alone will take its rivals 3-5 years to catch up, and it will not stand still as well. In 2010, TSMC topped the market by virtue of USD5.9 billion of expenditure, and is likely to remain unparalleled for the next 15 years.

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The wafer foundry industry in mainland China has continued to expand regardless of SMIC’s loss for 13 consecutive quarters. In 2010Q2, SMIC turned loss into profit relying on non-operating income of over USD100 million, and its operating income suffered losses of around USD10 million. Despite of the five-year successive losses, SMIC still plans to build a 12-inch wafer production line. Grace Semiconductor Manufacturing Corporation (Grace) and HHNEC invested RMB14.5 billion to build a 12-inch wafer production line in 2010. In 2009, the revenue of the 12-inch wafer production line completed by Wuhan Xinxin Semiconductor Manufacturing Corporation in 2008 was less than 12.5% of that of TSMC’s 8-inch plant in Shanghai. Meanwhile, Shenzhen also has built 8-inch and 12-inch wafer production lines.

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