Japan's NAND Industry Rides Strong Demand to Recover from Earthquake

Despite the human and economic toll wreaked by the Japanese earthquake one year ago, the countrys NAND flash memory industry managed to pull off a rapid rebound from the disaster, as strong demand and other factors allowed Toshiba Corp. to quickly regain some of its lost market share, according to the IHS iSuppli Memory & Storage Service at information and analytics provider IHS.

The earthquake that occurred on March 11, 2011 impacted the second-quarter results of Toshiba, the countrys only NAND flash maker. And because the earthquake occurred in March, the disaster mainly impacted Toshibas second-quarter 2011 financial results, causing the company to lose more than 6 percentage points of market share during the period. Corresponding share increases went to competitors Samsung Electronics Co. Ltd., Micron Technology Inc. and Hynix Semiconductor Inc.

However, in the third quarter of 2011, Toshiba had regained nearly 3 percentage points of share. During that period, the company described any remaining effects from the disaster as negligible.

"The overall effect of the Japan disaster on the NAND industry was short-lived, and several factors combined to lessen the impact of the earthquake on Toshiba and on the market as a whole," said Dee Nguyen, memory analyst at IHS. "One factor was that although Toshiba accounted for 35 percent of global NAND capacity at the time of the disaster, its Yokkaichi facilities were far enough from the epicenter to avoid significant damage. Furthermore, there were enough wafers in the supply chain for Toshiba to sustain its factories while wafer suppliers worked to restore production levels. Finally, throughout 2011, the NAND demand engine continued to chug along, propelled by rising sales to storage-intensive applications such as tablets, smartphones, and solid state drives (SSDs)."

On the materials side, wafer suppliers were quickly able to restore production one month later, as well as increase production at other sites to minimize any shortage issues to their major customers.

Furthermore, the disaster actually brought a better supply/demand balance to the NAND space in the intermediate term, which helped shore up pricing and propel the industry to 10 percent quarter-over-quarter revenue growth in the third quarter of 2011.

Toshibas NAND operations

Toshiba operates two NAND chip fabrication facilities in Japan, Fab 3 and Fab 4, that

are located in Yokkaichi, 500 miles from the epicenter of the earthquake. Immediately following the earthquake, both fabs went offline for a short time, which produced an immediate effect on NAND pricing in the spot market. Spot NAND prices then spiked by 10 to 15 percent.

However, after it became known that the earthquake had limited direct impact on the Yokkaichi fabs, NAND average selling prices (ASPs) stabilized. Toshiba reported no casualties, with little to no damage to public infrastructure in the area, the building or its power supply. One week after the earthquake, the Yokkaichi factory was operating normally again.

The company also was helped greatly by the fact that the government had prioritized electricity consumption to keep facilities in operation, mitigating the impact of power outages and minimizing the cost of idle fabs.

Bigger problems in raw materials

The bigger problem facing chip manufacturers following the quake came from any short- and mid-term effects incurred upon the semiconductor supply chain, which made it difficult for companies to procure raw materials for their production lines. Two of Toshibas 300-millimeter wafer suppliers, Shin-Etsu and Sumco, were located in the earthquake-affected area, and experienced damage to their equipment and facilities as a result.

Yet one month later, the wheels were already in motion toward a full recovery. By the second week of April, Sumco announced it had restarted mass production and also had hiked up manufacturing at its other sites. Meanwhile, Shin-Etsu, which was the most significantly affected, announced it was preparing to restart production in mid to late April. Thus, by the end of May, the supply of 300-millimeter wafers was close to pre-disaster levels, and the inventories at wafer vendors and chip suppliers were sufficient to sustain the industry through a month of lost production.

In July 2011, Toshiba opened a new fab-Fab 5-on the same Yokkaichi facility. With the memory of the earthquake in mind, the new facility boasted advanced earthquake-absorbing techniques, as well as power-compensation technologies designed to protect against power disruptions.

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