RESEARCH BULLETIN

IC Insights

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58% of Pure-Play Foundry Capacity Under High Risk for Seismic Activity

Many of the world's largest foundry facilities lie directly within the earthquake-prone Ring of Fire.

IC Insights recently released its new *Global Wafer Capacity 2016-2020* report that provides in-depth detail, analyses, and forecasts for IC industry capacity by wafer size, by process geometry, by region, and by product type through 2020.

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Researchers estimate that there are about 80,000 earthquakes globally each year, but most are too minor to notice. The Great East Japan Earthquake (a.k.a., 2011 Tohoku Earthquake) and subsequent tsunami that struck east of Sendai on March 11, 2011 caused substantial loss of life and destruction to infrastructure. It was the most powerful earthquake ever to hit Japan and the fifth most powerful in the world since records started being kept in 1900. Many semiconductor fabs, as well as other facilities that support the industry, were significantly damaged by the quake (some were shut down permanently as a result).

Since the earliest days of IC production in Silicon Valley, the IC industry has *always* had much of its fabrication facilities located in seismically active regions. Moreover, as of December 2015, roughly half of the world's total IC wafer production capacity was located in seismically active areas (defined as areas having moderate to high risk of being significantly impacted by earthquake tremors).

- Taiwan and Japan accounted for 39% of global IC capacity in December of 2015. Both countries are considered entirely seismically active, and have large amounts of IC capacity exposed to potential earthquake damage.

- Even though Southeast Asia is generally considered very active seismically, Singapore and Malaysia are actually considered relatively safe from earthquake damage. In China, Beijing is considered to have moderate-to-high seismic risk, but other cities such as Shanghai, Shenzhen, and Wuxi are considered to be "on solid ground." Similarly, while the Southern part of France has moderate seismic risk, the Central and Northern areas do not.

As shown in Figure 1, *64% of pure-play IC foundry capacity* is located in seismically active regions. Since two of the largest pure-play IC foundries in the world (TSMC and UMC) have such a significant presence in Taiwan, a disastrous earthquake or typhoon in that country would have serious ramifications for the entire electronics supply chain. In fact, because IC foundries have so many different customers and are sole-source producers for such a wide variety of part types, the ramifications of damage to IC foundry fabrication facilities would be much greater than damage done to individual IDM IC fabs.

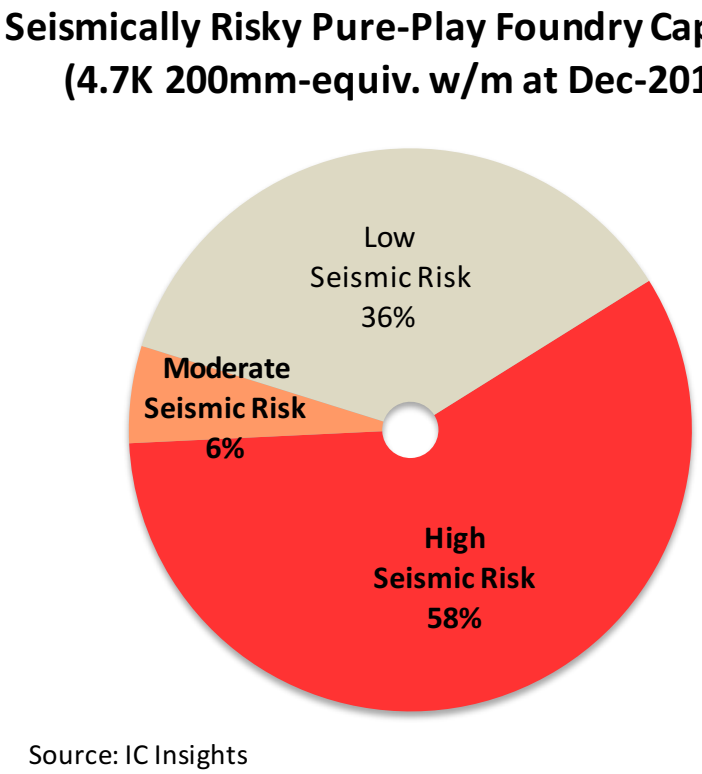

Figure 1

A few years ago, IC Insights was contracted to perform a proprietary market research report for a large insurance company. This company wanted to develop a model that showed how much in electronic system sales would be lost if the fabs in Taiwan were shut down for one, two, or three months due to damage caused by an earthquake or typhoon. When considering only the Hsinchu Science Park, which is home to about 45% of the island nation's total wafer capacity, it was determined that, for each month of net loss resulting from the Hsinchu fabs being out of operation, a $9.3 billion net negative effect would be exerted on worldwide electronic system sales!

Although the IC industry has *always* had the majority of its fabrication capacity located in "dangerous" areas, most buyers of ICs don't give this a second thought. Ultimately, all that really can be said about the ability to predict devastating natural disasters is that everything is just "fine" until one day it isn't. However, while these tragic events are impossible to predict, they are not impossible to plan for. The

Great East Japan Earthquake should have been a wake-up call to spur the entire electronics supply chain to create new contingency plans, just in case.

Report Details: *Global Wafer Capacity 2016-2020*

IC Insights' *Global Wafer Capacity 2016-2020—Detailed Analysis and Forecast of the IC Industry's Wafer Fab Capacity* report assesses the IC industry's capacity by wafer size, minimum process geometry, technology type, geographic region, and by device type through 2020. The report includes detailed profiles of the companies with the greatest fab capacity and gives comprehensive specifications on existing wafer fab facilities. *Global Wafer Capacity 2016-2020* is priced at $4,290 for an individual user license. A multi-user worldwide corporate license is available for $6,990.

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About IC Insights

IC Insights, Inc., based in Scottsdale, Arizona USA, is dedicated to providing high-quality, cost-effective market research for the semiconductor industry. Founded in 1997, IC Insights offers coverage of global economic trends, the semiconductor market forecast, capital spending and fab capacity trends, product market details, and technology trends, as well as complete IC company profiles and evaluations of end-use applications driving demand for ICs.

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