



On the Forefront

E. Jan Vardaman

Manufacturing Hot Spots 2005

Yes, China is still aflame. But the fires are heating elsewhere, too.

Given the uncertainty surrounding the worldwide economy, many electronics companies are weighing their options with respect to the best opportunities and most promising geographic regions in which to invest. During the past few years, many companies have experienced China fever, but with the recent slowdown in that nation's economy a number of companies may focus their attention on other areas.

Despite a slowdown, China is still a hot spot for electronics manufacturing. It ranks as the fourth largest manufacturing nation. China's Ministry of Information Industry (mii.gov.cn) predicts domestic IT and electronics sales will reach \$410 billion in 2005, up 28.3%, after gaining 40% in 2004.¹ Even with slower growth forecast, China continues to attract manufacturing operations with relatively low-cost labor, tax incentives and the promise of a large domestic market.

Semiconductor companies continue to announce fabs in China – Powerchip is the latest example. Billions of dollars have poured in new fabs since 2000 and companies are now investing into 300 mm fabs. SMIC is adding a 300 mm line and other companies are expected to install lines over the next few years. China's IC market is expected to be the world's largest in 2005, approximately \$34.3 billion, reports IC Insights (icinsights.com). Although the projected 11% growth this year is well off recent levels, it is far ahead of the 2% loss forecasted for the worldwide IC market. From 2001 to 2004, China's IC market experienced a 46% CAGR compared with a 14% CAGR for the American IC market (Figure 1).

Semiconductor assembly and test service providers continue to expand capacity in China. These companies include Amkor, ASE, Carsem, STATSChipPAC and GAPT. U.S. semiconductor makers are also opening new facilities or expanding existing operations. These companies include AMD, Fairchild Semiconductor, Kingston, Intel, Micron and National Semiconductor.

China's EMS revenue is projected to increase from \$18 billion in 2003 to \$45 billion in 2008, according to iSuppli (isuppli.com). If this pans out, China will generate 28% of the worldwide EMS revenue by 2008.² The merger of IBM's PC business and China's Lenovo signals a new era in China's PC manufacturing. While 70% of PC production will take place within China, 70% of

the sales will be outside the country. This makes China's former domestic PC maker a major exporter.

China is also seeing an expansion of LCD panel production by domestic makers as well as companies from Japan, Korea and Taiwan. Gold bump and LCD driver assembly is also expanding – especially in the Shanghai area. Companies from Taiwan, Singapore and Japan are expected to use facilities in China for future production of LCD driver ICs.

Rising labor costs. China has long been known for low-cost labor. According to Boston Consulting Group (bcg.com), the average hourly pay (including benefits) for production line workers in China is \$0.80 per hour compared with \$21.86 in the U.S. Nevertheless, labor rates in various regions of the country are rising. Labor rates in China's Pearl River Delta are reported to be \$120 per month compared with \$80 per month a few years ago. Recently, workers have been protesting working conditions and demanding higher wages. In Shanghai, it is often difficult to hire trained workers and engineers, and labor rates continue to rise. China's rising labor rates may make other Asian countries more competitive. For example, a number of companies have indicated that both Thailand and the Philippines offer comparable low-cost labor and are excellent manufacturing locations.

Concern remains about intellectual property issues in China – which enhances other regions. Sony's recently concluded five-year investigation into the piracy of its PlayStation and PlayStation 2 hardware and uncovered at least 10 counterfeiting operations with a daily production capacity of 50,000 units, including game consoles, modified chips and controllers. Sony even discovered counterfeiters using Chinese prison labor for

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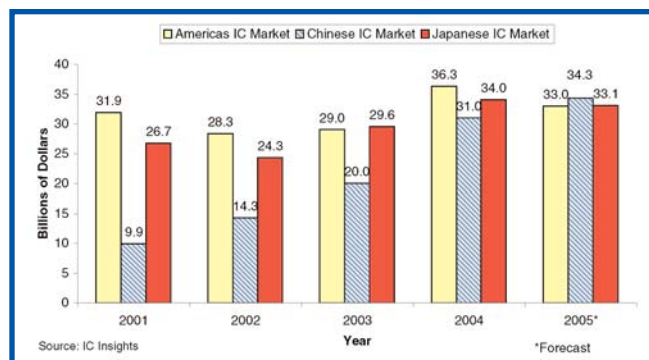


FIGURE 1: China is primed to take over as the leading IC producing nation this year.



product assembly.³ China promised to crack down on counterfeiting and recently issued new orders to curtail these activities. Piracy and counterfeiting may be difficult to control further away from Beijing.

Other hot spots. Thailand is home to a number of companies focused on hard disk drive and automotive electronics assembly. Companies expanding operations in this region include Fabrinet, Belton and PemStar. Fabrinet executives indicated that Thailand offers labor rates comparable to some regions of China, as well as tax incentives and a stable government. The company has been able to take advantage of the established infrastructure for electromechanical assembly and is expanding its optoelectronics assembly business.

The Philippines remains a major region for IC package assembly. Singapore has strong government support for R&D and is an important location for advanced technology developments. Malaysia is still perceived as a low-cost manufacturing site in the region with strong government support for the electronics industry.

South Korea, with heavy promotion from the government, is expanding IT production. Both Samsung and LG Electronics are making major moves to become key suppliers of information and communication products in 2005.

India is primarily viewed as a software hot spot, but there is increasing emphasis on hardware manufacturing. Mobile phone handset production is expected to start in 2005. Construction begins this year on India's first private sector semiconductor fab, in Hyderabad. Bangalore is also becoming a hot spot for manufacturing. While India has potential advantages for hardware manufacturing, infrastructure issues may slow progress.

Taiwan remains a key location for semiconductor fab operations and thus a hot spot for IC package assembly. Taiwan's Industrial Technology Intelligence Service (itis.org.tw) reported that Taiwan's IC industry production value grew 37% last year and is expected to grow 15% to NT\$1.3 trillion in 2005. Packaging and testing accounted for approximately 20% of projected revenue.

For many EMS providers, Eastern Europe remains an important manufacturing region. Many regions have talented

engineers and low-cost production line workers. As the EU grows in economic strength, operations in this region may become more important. ■

References

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3. Economist Intelligence Unit, January 6, 2005.

