

# A STRATEGIC PERSPECTIVE ON THE MATURING SEMICONDUCTOR EQUIPMENT INDUSTRY

**O**EM Capital recently participated in the Industry Strategy Symposium hosted by Semiconductor Equipment and Materials International in Pebble Beach, California, ISS 2002. We would like to share our current view of the industry outlook and identify strategic issues facing smaller equipment suppliers, those whose 2000 revenues were under US\$100 million.

Back in July 2001 we stated “2000 was a very big aberration and companies need to plan their business strategy around good growth from a lower base. You should not think that things are going to bounce back to last year’s levels in a few months --- it will be a few years.” We see no evidence in the marketplace that causes us to alter this perspective.

There is general industry consensus that the bottom of the semiconductor shipment cycle was reached in August-October of last year. Inventory liquidation is believed to be complete in almost every applications segment and, due to severe under-buying over the past several months, semiconductor bookings have increased modestly during the

past few months. However, contract electronic manufacturers (CEMs) have been slow to write down their obsolete inventory and, therefore, cumulative inventory figures for semiconductors (manufacturers, OEMs and CEMs) still appear, in the aggregate, to be above normal replenishment levels for the current reduced level of sales.

We believe electronic product demand growth at the user level, and not an inventory correction, will drive the next secular upturn. Such demand will grow from a proliferation of new products that improve functionality and lower prices. (The worldwide semiconductor industry’s revenues in 2001 were smaller than the revenues of the General Motors Corporation.) Improved functionality will be fueled by fabless semiconductor firms pushing the design envelop and larger firms needing to be freed of the economic need to fill the

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RONALD J. KLAMMER  
*OEM Capital*  
*Westport, CT*

capacity of their in-house fabs. Lower prices will be fueled by lower cost semiconductors due to the continuation of Moore's Law.

Many semiconductor firms have adopted a foundry-less business model influenced by the heavy semiconductor capacity expansion of 2000-2001. Capacity expansion will continue to be driven by foreign government subsidies of new fabs located in China and Taiwan. However, capacity at 130 nm line width and below will not be able to satisfy demand in the next up cycle while there will be substantial capacity above 250 nm line width. New materials and continued design 'shrinks' at 130 nm line width and below, 300 mm diameter wafers, and China's push to add as many as 25 new fabs, many under 250 nm, will be the prime revenue drivers for semiconductor equipment companies over the next few years.

Capital expenditures by semiconductor manufacturers are expected to decline year-over-year by 25% in 2002. This was recently underscored by Intel's announcement of a capital budget reduction in 2002 from that of the previous year.

The lowest shipment quarter for equipment manufacturers is expected to be 2Q02 with the second half of 2002 anticipated to show sequential shipment growth over the second half of 2001.

### ***Longer Term, Semiconductor Sales Growth Will Slow and Adversely Impact Equipment Suppliers***

In the past decade, semiconductor content in electronic products has grown from under 10% to slightly over 20%, but semiconductor content has remained constant for the past few years. Therefore, absent a surge in electronic product growth, semiconductor revenue growth rates are expected to be cut in half from their historical levels of the past ten years (18%) to those of electronic end product growth rates (historically 9%), due to the leveling off of the semiconductor dollar value as a

percentage of total product value. Therefore, even with continued unit growth of electronic products due to new devices and an economic recovery, we do not believe that the semiconductor equipment industry will revisit its 2000 revenue level for three or more years.

### ***Semiconductor Die Shrinkage Trends Will Unfavorably Impact Equipment Revenues***

Over the longer term, increasing yields and more devices per wafer will require fewer pieces of capital equipment. Although more sophisticated equipment will be required, with higher price points, the reduced need for quantity will have a major deflationary impact on equipment revenue growth.

These trends have strong implications for companies considering to enter the semiconductor equipment market as well as for smaller participants already there.

### ***New Equipment Manufacturers Will Have a Very Difficult Time***

The semiconductor equipment industry is already mature and new market entrants will have a difficult time establishing distribution.

Tighter integration of tools and process segments, due to the high cost of semiconductor manufacturing facilities and the high stakes to make a smooth implementation of new lines, is driving mandatory partnerships between semiconductor manufacturers and equipment companies. There is little room in this model for new companies entering the market because products need to be tightly coupled to the semiconductor manufacturing process and the industry's technology roadmap. Furthermore, larger equipment companies are moving to increase service revenues to minimize cyclical revenue swings from the sale of new equipment. Such programs will develop stronger relationships between

established players. New entrants will find it very difficult to be successful by merely introducing products that are technically superior, particularly if such technology advantage is due to an 'island of development' that is independent of a semiconductor manufacturer.

### ***Critical Decisions Also Looming for Smaller Equipment Companies***

The strategic squeeze on smaller semiconductor equipment companies (those whose annual revenues in the 2000-2001 period were less than US\$100 million) that began a few years ago, and masked by the strong 2000-2001 capacity expansion, will intensify as the industry consolidation continues.

We anticipate that less than twenty companies, we call them the 'Final Twenty', will account for almost all the worldwide semiconductor equipment shipments in wet processing, back-end fabrication, metrology and packaging within five years.

What should companies not destined to be in the Final Twenty do?

We recommend that semiconductor equipment companies that do not have the financial resources to weather another down year should immediately seek new partners within the industry.

We also recommend that semiconductor equipment companies that have good balance sheets and favorable short-term revenue growth prospects (due to strong industry partnerships), but do not have the critical mass to be among the Final Twenty, should begin to groom themselves for a sale or merger, with a target to close near the beginning of a recognized industry up cycle. The optimal time for such companies to extract the best value for their shareholders is at the beginning of such a 'swoosh' cycle when the industry's stock prices have upward momentum. Because a private sale auction

process can take several months, companies should plan to kick-off such a program sometime this year, but no later than early 2003.



*Ronald J. Klammer is a managing director and president of OEM Capital Corp. (DE). In 1985 he co-founded its predecessor firm, a New York partnership, where he led its technology practice. He has over 35 years of experience in all aspects of the electronics industry.*

*Previously, Mr. Klammer was a corporate vice president of Gulton Industries, Inc., a diversified NYSE electronics company, where he was responsible for initiating and closing the acquisition and divestiture of six businesses and returning four divisions to profitable growth. Prior to this, Mr. Klammer was vice president of Cross River Products, Inc., a venture-capital-backed manufacturer of consumer products. Earlier, he held various management and technical positions with General Electric's Missile and Space Business Group with a specialty in communication, control and computer systems.*

*Mr. Klammer holds a Bachelor of Electrical Engineering degree from Villanova University, a Master of Science degree from the University of Pennsylvania and a Master of Business Administration degree with distinction from Harvard University's Graduate School of Business Administration.*

Ronald J. Klammer

**OEM Capital**

Tel 203-226-7052, ext. 102

Fax 203-226-5741

e-mail [rjk@oemcapital.com](mailto:rjk@oemcapital.com)

[www.oemcapital.com](http://www.oemcapital.com)

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## **OEM Capital**

**Technology Investment Banking  
Electronics • Communications • Computers**

1071 Post Road East • Westport, CT 06880-5361 • Voice (203) 226-7052 • Fax (203) 226-5741  
126 East 56<sup>th</sup> Street • New York NY 10022 • Tel (212) 319-3435 • Fax (212) 319-3209  
HomePage <http://www.oemcapital.com> • e-mail [oem@oemcapital.com](mailto:oem@oemcapital.com)