

SEMI AROUND THE WORLD

DuPont's Coder Elected SEMI Chairman for 2008

Jerry Coder, president emeritus of the Semiconductor Materials Business unit of DuPont Electronic Technologies, has been elected chairman of the SEMI International Board of Directors. Coder succeeds Archie Hwang, chairman and CEO of Hermes-Epitek, who served as chairman for the past year.

Coder has over 40 years of semiconductor industry experience and has served in numerous leadership roles for SEMI, including chairman of the SEMI Finance Committee, member of the Board's Executive Committee, member of the Environmental Health and Safety (EHS) Executive Committee, and member of the Emerging Technologies Committee.

In addition to the chairman, the association elected the following new board members: Susumu Kohyama, president and CEO, Covalent Materials; Kiyoshi Togawa, senior vice president and executive officer, Hitachi Chemical; Way Tu, CEO and president, Allegro Manufacturing; and Kazuo Ushida, president of Nikon's Precision Equipment Company. •

Ikeda Honored with Karel Urbanek Standards Award

Kazuko Ikeda was honored with the Karel Urbanek Award, which recognizes industry technologists for their outstanding contributions to the development of standards for the semiconductor and related industries.

"We are pleased to recognize the great efforts put forth by Ikeda-san for her tenacity in helping to coordinate JEITA and SEMI standards activities," said Stan Myers, president and CEO of SEMI. "Her work has been instrumental in enabling SEMI to become a truly global organization for the worldwide semiconductor industry."

Ikeda led the Japan Silicon Wafer Committee for 11 years from 1995 to 2006, during which time she took leadership of developing 300 mm wafer specifications and other related standards. In addition, she served on the Japan Regional Standards Committee (JRSC), contributing her knowledge of silicon applications for various devices, including discrete, bipolar and MOS. •

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Europe on the Move

EUROPE IS HOME TO 278 PRO-duction and research and development fabs that manufacture a diverse range of ICs, MEMS, power devices, compounds and innovative packages, according to the SEMI European Microelectronics Market Study. This diverse mix of production resources represents over \$6 billion in annual equipment and materials sales.

Wafer manufacturing capacity in Europe is forecasted to grow by more than 6% this year, representing about 12% of worldwide capacity, according to the SEMI Fab Futures database, with similar growth forecasted for next year. Europe is a strong player in advanced semiconductor manufacturing; 300 mm fab capacity in the region is expected to increase by 30% this year. There are currently five 300 mm volume semiconductor fabs in Europe, with two more expected to come on line by the end of 2008.

Europe has for a long time taken a global lead in photovoltaic research and applications, as well as MEMS production. Along with its manufacturing prowess, Europe boasts three world-class semiconductor R&D centers of excellence: IMEC, Leti and Fraunhofer.

Against this environment, next month's SEMICON Europa promises to attract the best and brightest. Since its inception in 1975, SEMICON Europa has become the preferred platform for device manufacturers, equipment and materials suppliers, start-ups and R&D organizations to explore new opportunities in the development and commercialization of new products.

This year the expo takes place at new location and at a new time. SEMICON Europa 2007 will be held October 9 to 11 at the New Stuttgart

Trade Fair Centre, in Stuttgart, Germany. Here are a few highlights:

11TH FAB MANAGERS FORUM

October 12, Hotel Maritim, Stuttgart

This year's forum will include the following themes: "Enhancements of Mature Fabs, Enabling Technologies and R&D in Manufacturing," and "Overall Asset Utilization and Competitive Cost Management."

THE LITHOGRAPHY TRIANGLE: RESOLUTION, PRODUCTIVITY, COST CONTROL

October 10

This seminar focuses on alternative imaging systems and their value for the European semiconductor industry. The agenda includes sessions on Imprint Lithography, Maskless Lithography, and Double Patterning Methods.

SEMICONDUCTOR EQUIPMENT ASSESSMENT FOR NANOELECTRONIC TECHNOLOGIES SEMINAR

October 10

This workshop will introduce the SEA-NET project, which is funded by the European Commission. The objective of SEA-NET is to validate emerging manufacturing equipment for advanced process requirements at the 65 nm, 45 nm, 32 nm and 22 nm technology nodes.

POWER, HIGH VOLTAGE & RF TECHNOLOGIES

October 10

This session focuses on semiconductor applications at the high end of the power consumption spectrum, including high voltage and RF technologies.



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PHOTOVOLTAICS

Semiconductor Process Research and Development Will Drive Solar Energy Innovations

THE PHOTOVOLTAIC MARKET IS set to be the next wave of high technology innovation, according to keynote speakers at SEMICON West 2007.

“We are going to turn Silicon Valley into Energy Valley,” said T.J. Rodgers, founder and CEO of Cypress Semiconductor and chairman of SunPower. “Photovoltaic is just another way of using silicon. We turn silicon into gold... we are the modern day alchemists,” he said.

Solar panels are manufactured with the same process technology used for semiconductors. However, there are significant differences between the two industries. Rodgers explained that the equipment used to make silicon-based solar cells is equivalent to that used in a wafer fab circa 1985. The difference between equipment

for solar cell production and semiconductors is that solar has to be 10 times cheaper and 10 times faster in terms of output, according to Rodgers.

Solar production is also a lot bigger than integrated circuits. SunPower produces solar cells at a converted disk drive facility in Manila, the Philippines, which has a capacity of 32 million wafers per year. That compares with a large semiconductor fab that would produce 1.2 million wafers per year. Another key difference cited by Rodgers was uptime; equipment used to make solar cells needs an uptime of 99.8 percent, contrasted to a typical uptime of 90 percent in the semiconductor industry, according to Rodgers.

A shortage of feedstock, or polysilicon for wafers is pushing the PV industry to produce thinner wafers. SunPower started making wafers that were 250 microns thick and now has them down to 166 microns. “Everybody’s company could be bigger if they could get more silicon [feedstock],” according to Rodgers.

Last year marked the first time that the solar industry overtook integrated circuits as the largest consumer of polysilicon, according to Rhone Resch, president of the Solar Energy Industry Association (SEIA). By 2010, solar will be twice as big as the IC sector in terms of consumption of polysilicon.

However, “solar will not grow without the help of the semiconductor industry,” said Resch. “Photovoltaic needs manufacturing solutions that I think should come from the semiconductor industry.”

The global solar market is predicted to experience a compound annual growth

rate of 36% over the next four years, but the U.S. growth rate will be faster at 83% CAGR, according to the SEIA. Driven by Federal tax credits and lower retail costs, the U.S. market will install 8,000 megawatts of capacity over the next decade. That compares with only 145 megawatts installed in the U.S. in 2006.

“Solar in the U.S. will have a German-like growth curve,” said Resch, referring to the fast-growing German market, currently number 1 in the world. Not only that, Resch predicts that solar energy will become the fastest growing high-technology industry as well. “Solar will rapidly become the next ‘gotta have it’ technology,” he said.



By 2015 solar technology will be cheaper than electricity, but that will only happen with continued research and development from the semiconductor sector in order to improve PV efficiencies, according to Resch.

SunPower’s Rodgers puts the cost crossover even earlier, saying that by 2010 solar-generated power would be \$2.11 per watt, enabling it to compete “head to head” with electricity suppliers such as Pacific Gas and Electric (PG&E)—without the benefit of current subsidies. “When it got to under \$4 per watt in early 2000, that’s when the [solar] industry really took off,” he said. •

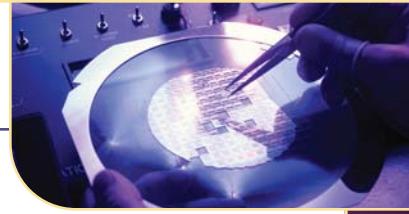
PERSPECTIVES *continued*

6TH SILICON WAFER STANDARDS WORKSHOP October 10

The workshop, titled “Silicon Wafer Trends and Requirements Going Forward”, will inform the semiconductor community about future silicon wafer developments and potential standardization needs.

As well as these special events and many more like them, SEMICON Europa offers the most efficient and cost-effective way to communicate with customers and suppliers. Face-to-face marketing is still a vital part of maintaining business relationships and influencing the perception of important buyers and specifiers.

I look forward to your participation in SEMICON Europa. — *Stan Myers* •



FABS

The Next Generation Fab: Defining 300 mm Prime

300 MM PRIME CAN BE VIEWED AS AN UMBRELLA strategy under which the semiconductor industry can pursue waste reduction and significantly improve efficiency in the wafer fab, according to a panel of industry executives.

"There is still some confusion because a lot of people think of 300 mm Prime as synonymous with the next generation fab. To me, it is an evolution of the things we need today," said Elizabeth Williamson, director of 300 mm Semiconductor Operations, IBM Systems and Technology Group.

Williamson was one of a five-member panel at a symposium entitled "Next Generation Fab: Defining 300mm Prime", held during SEMICON West 2007 in July. Steve Buehler of SEMI moderated the panel, described as "raising issues, explaining the benefits, and building consensus" around the need for such an approach.

"When you look under the covers, there is a lot of room for improvement," according to Williamson, especially in terms of idle wafer time during WIP. She said the "day to day distractions" take up a lot of resources. A 10 to 15 percent productivity gain can be made simply through continuous improvement efforts, she noted. After that, the industry can start talking about new approaches that may require more capital. "As you fix certain problems, you have time to focus on bigger issues," said Williamson.

Shigeru Kobayashi, chief engineer, EES and e-manufacturing for Renesas, pointed out that fab engineers are busy dealing with multiple products and reduced cycle times, and therefore the focus should be on improving engineering efficiency. "The history of the past three or four years is that we are fighting inefficiency in production," he said. "What we expect from 300 mm Prime is higher efficiency. We need a smart means to control the complex environment."

To further that goal, Renesas would like to deepen its cooperation with equipment and materials suppliers. "The next step is bringing in real effective co-operation between suppliers and [device makers]," said Kobayashi.

Iddo Hadar, chief technology officer for Applied Materials, said the changes that need to happen to redefine fab productivity will cut across multiple users and multiple suppliers, requiring a lot of collaboration. "They will require a common vision and common understanding of what the opportunities and what the issues are," he said.

Hadar pointed out that the importance of faster cycle times has come about because of the shift to a consumer electronics-driven market, where product life cycles are shorter and time to market or time to volume is critical to meet market windows.

Christopher Hofmeister, vice president of engineering for Brooks Automation, said the 300 mm Prime effort has seen the focus move from yield towards productivity improvements. "When you talk about productivity, there are two key elements: cycle time improvements and cost reduction," he explained. "In terms of cycle time reduction, we are doing things such as cutting lead time of tool deliveries ... looking at alternative automation architectures, and small lot manufacturing," he said. Hofmeister added that, due to the consumer-driven environment, focusing on cycle times was "a cornerstone of the 300 mm Prime effort."

Dave Gross, director of global manufacturing systems technology for Advanced Micro Devices, said the approach with AMD's 300 mm fab in Dresden, Germany was to target waste and cycle time reduction in order to improve productivity without the need to spend more on capital. "We did it through lean methodologies. There are many opportunities to improve productivity, cycles times and reduce inefficiencies," he said. "Eighty percent of the time that it's in a fab, a wafer is waiting for something to happen to it — not being processed, but waiting."

Gross lamented that a lot of the work on waste elimination was being done "behind closed doors", whereas it should be "out there" as a co-operative, industry-wide effort. More discussion with the supplier community was the key to solving problems, according to Gross. He added that the productivity

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SEMI AROUND THE WORLD

Worldwide MEMS Systems Market Set to Reach \$72 Billion by 2011

The market for micro-electromechanical systems (MEMS) totaled \$40 billion in 2006, and is expected to top \$72 billion by 2011, according to Global MEMS/Microsystems Markets and Opportunities, a market research report from SEMI and Yole Développement.

The MEMS devices at the heart of these systems totaled \$5.9 billion in 2006, and are projected to grow to \$10.8 billion by 2011, with a compound annual growth rate (CAGR) of 13%, fueled by increasing use in consumer electronics.

The materials and equipment used to manufacture MEMS devices topped \$1 billion in 2006, with MEMS materials forecasted to grow at CAGR of 13%. MEMS equipment is forecasted to grow at a CAGR of 9% through 2011. Materials demand is driven by substrates, making up over 70% of the market, packaging coatings and increasing use of chemical mechanical planarization (CMP). The report is available for no charge to SEMI members at www.semi.org/mems. Non-SEMI members can purchase the report directly from Yole Développement for €2,000. •



FABS *continued*

improvements envisioned under 300 mm Prime are not something for the future—they are being implemented today, and can also be applied to 200 mm fabs that upgrade to 300 mm.

Applied's Hadar urged the industry to do more than just “attend conferences and talk about” the problems. “Left to its own devices, this is not going to happen [by itself]. There is a risk that we agree intellectually, and not execute it because there is

not the business impetus to make that happen,” Hadar said.

A question-and-answer session brought numerous interested attendees to the microphones, and lively discussion about the maximum benefit from this effort, the contrast and complement to 450 mm discussions, and implementation were discussed. The panel closed with the observation that SEMI's Manufacturing Task Force was a good place to gather current information and steps for attendee participation. •

SEMI FPD STANDARDS

What's Next?

BY BETTINA WEISS, *director,*
SEMI International Standards

“SEMI HAS LONG BEEN ACTIVE in setting FPD standards,” said Bettina Weiss, director of SEMI International Standards, “but we see some strong opportunities coming up in the near future. The question is: Will the industry realize the collective need, step up and help get these standards developed?”

SEMI has a long history in the FPD industry. Because of the similarities between the technologies utilized in chip making and display fabrication, many SEMI members who began in the semiconductor industry also support FPD panel makers. Consequently, SEMI events, market statistics, International Standards, EHS support, and other SEMI activities have increasingly addressed the important needs of the FPD community. The oldest SEMI FPD Standard still in existence is SEMI D3-91 Quality Area Specification for Flat Panel Display Substrates, which was published in 1991 and reapproved in 2003. Over the past 15 years, over 50 other SEMI standards addressing topics ranging from substrate size to Mura measurement to large area masks have been developed.



“There are some serious challenges to developing FPD standards,” continued Weiss. “In many areas of the semiconductor field, manufacturers and OEMs sat down and defined a ‘standards roadmap’ largely based on device manufacturer (user) guidelines, to show what should be done first, or second, or not at all. We haven't seen that to the extent necessary yet among FPD equipment manufacturers, panel makers, or display manufacturers.”

“But I am extremely optimistic about what we're doing and how we're moving forward,” she continued. “We've been working to develop a ‘standards needs assessment’ survey, and we expect to release that in September of this year. That will help us define a standards roadmap for FPD, and we can then begin facilitating the FPD standards development process based on the data we receive. It is important that we understand the needs and requirements of our stakeholders and help them develop critical industry standards that address these needs. I fully expect that we'll have a

comprehensive SEMI global FPD strategy in place, and standards will be a large part of that,” she said.

“SEMI is perhaps the only organization that can fill this need,” she added. “With our global infrastructure, our ability to provide local support in all FPD manufacturing regions of the world, and our experienced standards support staff, SEMI is ready to help. The biggest part, though, is that manufacturers, suppliers, and everyone involved have to step up and participate in the process. We have over 1,500 standards volunteers in the semiconductor, FPD, and MEMS manufacturing industries, we're about to expand our program into the photovoltaic sector, and we've demonstrated the value of this collective effort many times. We need to have that same participation in order to get the same success in FPD standards.”

For more information contact Bettina Weiss at bweiss@semi.org. •

CALENDAR OF EVENTS

OCTOBER 2007

October 9-11
SEMICON Europa 2007
New Stuttgart Trade Fair Centre
Stuttgart, Germany
www.semi.org/semiconeuropa

October 17
SEMI Awards Dinner
Santa Clara Marriott
Santa Clara, California
www.semi.org/semiaward

October 24-26
FPD International 2007
Pacífico Yokohama
Yokohama, Japan
www.semi.org

NOVEMBER 2007

November 4-7
International Trade Partners Conference 2007 (ITPC)
Grand Wailea Resort
Maui, Hawaii
www.semi.org/itpc

DECEMBER 2007

December 5-7
SEMICON Japan 2007
Makuhari Messe
Chiba, Japan
www.semi.org/semiconjapan •