Webinar: Outlook on the Semiconductor Manufacturing Industry

December 11, 2012
While 2012 started out promising, declines in monthly unit shipments and weakening equipment ordering activity during the second half have industry watchers wondering when the next upturn will occur. This presentation will discuss recent revenue trends and provide a forecast through 2014 for semiconductor materials.

Will fab equipment spending in 2013 see positive or negative growth? How many construction projects will there be next year? What should we expect for capacity growth? This presentation is based on SEMI’s World Fab forecast report which captures ~200 fab projects. Closely following macroeconomic indicators and possible capex changes such as by TSMC, Samsung and Intel, the data presented forecasts the impact to fab spending and capacity.
SEMI Industry Research & Statistics
Introduction & Overview

- SEMI Industry Research and Statistics Group provides market data and market research reports covering semiconductor capital equipment, photovoltaic equipment, semiconductor materials, packaging materials, semiconductor, optoelectronics, and high brightness LED fabs.

- Our major reports collect primary data from suppliers around the world following strict professional standards of confidentiality.

- SEMI reports provide trends, forecast, and outlook to help the industry make important investment, strategic, and business planning decisions.
# Market Research Reports

## Semiconductor Equipment
- Equipment Market Data Subscription (EMDS)
- Book-to-Bill Report
- WWSEMS (1991-2011)
- Book-to-Bill (1991-2011)

## Semiconductor Materials
- Material Market Data Subscription (MMDS)
- Photomask Report *
- Silicon Reclalm Wafer Report *

## Fabs / Foundries
- World Fab Forecast
- FabFutures
- World Fab Watch

## Semiconductor Packaging
- Global Semiconductor Packaging Materials Outlook 2011/2012
Market Research Reports

LED
- Opto/LED Fab Watch
- Opto/LED Fab Forecast
- China LED Fab Industry

Photovoltaic
- Worldwide Photovoltaic Equipment Market Statistics Report

Enabling Products
- Mass Flow Controller
SEMI Industry Research and Statistics

Products and data collection programs:

www.semi.org/marketinfo
Email: mktstats@semi.org

Other Resources

Industry Articles/Press Releases: www.semi.org/marketinfo
Fab Articles/Interactive Maps: www.semi.org/fabs
Market Research Products: www.semi.org/store
SEMI Member-Only Webinar Archive: www.semi.org/en/node/38101
Semiconductor Materials Update
Lara Chamness, SEMI
Senior Market Analyst Manager

Ms. Lara Chamness is responsible for SEMI’s data collection programs for equipment and materials. This includes the interactions with SEMI’s participating companies, partners and subscribers. Prior to joining SEMI in 2005, Ms. Chamness worked for Honeywell’s Electronic Materials business in a variety of marketing roles, with the most recent being Marketing Analyst. Ms. Chamness is originally from the San Francisco Bay Area and has BA/MS degrees in environmental sciences from University of California and a MBA from Santa Clara University. Ms. Chamness has been following the semiconductor industry for twelve years.

Fab Spending and Capacity in 2013!
Christian Gregor Dieseldorff, SEMI
Senior Analyst, Director of Market Research

Chris has over 25 years of industry. He earned an engineering degree in chemistry in Germany and began as development engineer at Siemens in Munich in 1986. In 1990 Chris moved to the US as one of the first members of the “Development Alliance Team” at IBM Fishkill at the first 200mm fab. In the years of 1996 to 1999 he was also the engineering manager and director of the first 300mm beta line at I300I at International Sematech in Austin, Texas. In 1999 he became the quality assurance manager for Memory and Graphic chips at Infineon North America. Since 2001 he conducts market research and analysis for worldwide cleanroom facilities first or Strategic Marketing and later also for SEMI in San Jose, California.
SEMI Equipment & Materials Outlook

Lara Chamness, Sr. Market Analyst, Industry Research & Statistics
SEMI
December 11, 2012
Outline

• Market Trends

• Semiconductor Materials Outlook

• Summary
Economic and Electronics Market Overview

Global Economy
• Expectation of very modest improvement in the global GDP in 2013
• Concerns remain: Euro crisis, US “fiscal cliff”, slowing economies in the “BRICs”…

Electronic Systems Outlook in 2013
• Mobile products are the key driver:
• Tablet market could see 40% growth in 2013
• “Traditional” PC expected to see low to few percentage points annual growth over the next several years.
• Total electronic systems growth could grow 5% following an essentially flat year for 2012

Source: Henderson Ventures, Semico Research, and various news sources
2013 Semiconductor Revenue Forecasts

Mid- to high single growth forecasted

Source: SEMI
Silicon Area Shipment Index

Worldwide Wafer Area Shipment Index
(Three-month moving average)

Source: SEMI Silicon Manufacturers Group November 2012
Silicon Shipments and Monolithic IC Units

Source: SEMI SMG October 2012, SIA/WSTS November 2012

*Silicon data are for semiconductor applications only
Silicon and Leadframe Shipment Trends

Source: SEMI/JAST, SEMI Silicon Manufacturers Group
Global Silicon Wafer Outlook by Diameter

Includes polished and epi wafers. Excludes reclaim, non polished, and SOI.

Total Regional Materials Markets

2012F = $47.7 Billion

<table>
<thead>
<tr>
<th>Region</th>
<th>2012F $B</th>
<th>2013F $B</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>3.12</td>
<td>3.21</td>
<td>3%</td>
</tr>
<tr>
<td>China</td>
<td>5.08</td>
<td>5.67</td>
<td>12%</td>
</tr>
<tr>
<td>North America</td>
<td>4.83</td>
<td>4.96</td>
<td>3%</td>
</tr>
<tr>
<td>South Korea</td>
<td>7.43</td>
<td>8.02</td>
<td>8%</td>
</tr>
<tr>
<td>ROW</td>
<td>8.10</td>
<td>8.39</td>
<td>4%</td>
</tr>
<tr>
<td>Japan</td>
<td>8.70</td>
<td>8.70</td>
<td>0%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>10.40</td>
<td>10.79</td>
<td>4%</td>
</tr>
<tr>
<td>Total Regions</td>
<td>47.66</td>
<td>49.75</td>
<td>4%</td>
</tr>
</tbody>
</table>

* Totals may not add due to rounding

Source: SEMI Materials Market Data Subscription November 2012
Materials Forecast By Segment

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging</td>
<td>6.84</td>
<td>7.54</td>
<td>9.27</td>
<td>11.95</td>
<td>12.77</td>
<td>15.54</td>
<td>17.59</td>
<td>18.32</td>
<td>17.51</td>
<td>21.80</td>
<td>23.05</td>
<td>24.14</td>
<td>25.76</td>
<td>27.02</td>
</tr>
</tbody>
</table>

* Totals may not add due to rounding.

Source: SEMI Materials Market Data Subscription November 2012
Emerging Fab Material Trends and Issues

• Multilayer patterning materials are ramping in volume production

• Scaling of emerging memory cell material systems
  – “Dry etch, CMP, cleans and cell material sources/methods will be challenged beyond normal evolutionary paths”

• Directed Self-Assembly development underway
  – Use block co-polymers (BCP) for “low cost patterning of fine structures”
  – Reported progress in reducing defectivity levels

# Worldwide Wafer Fab Materials Forecast

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon Wafers(^1)</td>
<td>$10,179</td>
<td>$10,399</td>
<td>$9,400</td>
<td>$9,778</td>
<td>$10,450</td>
</tr>
<tr>
<td>Photomasks(^2)</td>
<td>3,042</td>
<td>3,120</td>
<td>3,239</td>
<td>3,350</td>
<td>3,467</td>
</tr>
<tr>
<td>Photoresists</td>
<td>1,164</td>
<td>1,279</td>
<td>1,375</td>
<td>1,435</td>
<td>1,541</td>
</tr>
<tr>
<td>Photoresist Ancillaries(^3)</td>
<td>1,304</td>
<td>1,409</td>
<td>1,525</td>
<td>1,589</td>
<td>1,702</td>
</tr>
<tr>
<td>Wet Chemicals(^4)</td>
<td>850</td>
<td>908</td>
<td>996</td>
<td>1,055</td>
<td>1,161</td>
</tr>
<tr>
<td>Gases</td>
<td>2,888</td>
<td>3,117</td>
<td>3,180</td>
<td>3,417</td>
<td>3,616</td>
</tr>
<tr>
<td>Sputter Targets(^4)</td>
<td>599</td>
<td>575</td>
<td>581</td>
<td>608</td>
<td>604</td>
</tr>
<tr>
<td>CMP Slurry &amp; Pads(^5)</td>
<td>1,254</td>
<td>1,274</td>
<td>1,388</td>
<td>1,538</td>
<td>1,680</td>
</tr>
<tr>
<td>Other/New Materials(^6)</td>
<td>1,766</td>
<td>2,058</td>
<td>2,246</td>
<td>2,474</td>
<td>2,722</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$23,046</strong></td>
<td><strong>$24,139</strong></td>
<td><strong>$23,930</strong></td>
<td><strong>$25,243</strong></td>
<td><strong>$26,943</strong></td>
</tr>
<tr>
<td><strong>% Growth</strong></td>
<td><strong>4.7%</strong></td>
<td><strong>-0.9%</strong></td>
<td><strong>5.5%</strong></td>
<td><strong>6.7%</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Totals may not add due to rounding

Source: SEMI Materials Market Data Subscription November 2012
Wafer Fab Materials Forecast Notes

1. Silicon wafers include merchant sales value only; includes SOI wafers; no reclaim wafers
2. Includes captive market
3. Includes resist removal chemicals, developers, anti-reflective coatings, contrast enhancers, edge bead removers, adhesion promoters, etc.
4. Source is Techcet Group LLC, includes precious metals
5. Estimates for IC applications only
6. Includes low k dielectrics, copper plating solutions, dielectric precursors, organometallic precursors, etc.
7. All forecasts in current dollars
8. Source for all data is SEMI, unless otherwise indicated

Source: SEMI Materials Market Data Subscription November 2012
Materials for Wafer-level Packaging (WLP) and Through Silicon Via (TSV)

New Materials Required:
- Temporary bonding materials
- CMP slurries
- Underfill and encapsulant materials
- Dielectrics
- Interposers
- Thermal materials

Materials compatible with high-volume manufacturing resulting in high yields and high reliability packages
# Worldwide Semiconductor Packaging Materials Forecast

<table>
<thead>
<tr>
<th>US$ Millions</th>
<th>Actual</th>
<th>Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2010</td>
<td>2011</td>
</tr>
<tr>
<td>Leadframes</td>
<td>$3,394</td>
<td>$3,461</td>
</tr>
<tr>
<td>Organic Substrates$^1$</td>
<td>8,994</td>
<td>9,826</td>
</tr>
<tr>
<td>Ceramic Packages</td>
<td>1,377</td>
<td>1,423</td>
</tr>
<tr>
<td>Encapsulation Resins</td>
<td>1,926</td>
<td>2,097</td>
</tr>
<tr>
<td>Bonding Wire$^2$</td>
<td>4,968</td>
<td>5,551</td>
</tr>
<tr>
<td>Die Attach Materials$^3$</td>
<td>656</td>
<td>698</td>
</tr>
<tr>
<td>Others$^4$</td>
<td>484</td>
<td>562</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$21,799</td>
<td>$23,618</td>
</tr>
<tr>
<td>% Growth</td>
<td>8.3%</td>
<td></td>
</tr>
</tbody>
</table>

* Totals may not add due to rounding

Source: SEMI Materials Market Data Subscription November 2012
Semiconductor Packaging Materials Forecast Notes

1. Source is TechSearch International. Includes PBGA, PPGA, LGA, and CSP laminate substrates and flex BGA and CSP substrates

2. Assume gold value of $1,200/trz for 2010, $1,550/trz for 2011, and $1,600/trz for 2012 - 2014

3. Includes die attach film (tape) materials

4. Other includes solder balls and wafer level package dielectrics

5. Source for all data is SEMI, unless otherwise indicated

6. All forecasts in current dollars

Source: SEMI November 2012
Summary

• **Macroeconomics**
  • Cautiously optimistic for 2013

• **Data Trends**
  – 2012 started out promising
    – Silicon, ICs and Leadframes showed strong 1H2012
    – Unit shipments started to weaken in 3Q and continue to be weak

• **Materials Market**
  – $48 billion market this year, flat year/year
  – +4% in 2013
  – +5% in 2014
Acknowledgements

• Dan Tracy, Senior Director Industry Research and Statistics, SEMI

• Lita Shon-Roy, Sr. Managing Partner, Techcet Group, LLC.
Fab Spending and Capacity in 2013

SEMI Webinar: Outlook on the Semiconductor Manufacturing Industry

C.G. Dieseldorff, Senior Analyst
Industry Research & Statistics Group at SEMI

December 11, 2012
Outline

• Intro of World Fab Forecast report
• Comparison & changes of forecasts and comparison of various forecasts
• Positive indicators for 2013
• Rollercoaster: revenue and capex ride the same roller coaster
• Fab equipment spending trend
• Installed capacity trend
• Fab construction projects
• Fab status forecast into 2017
World Fab Forecast Report

Activity & Status
from end August 2012 to end November 2012

✓ We made 307 updates on 211 facilities.
✓ We added 15 new facilities (4 new and 11 existing).
✓ We closed 6 facilities and cancelled 3 fab projects.

➢ The report lists a total of 1,155 Front End facilities including 187 LED fabs (R&D to high volume).
➢ There are 78 future facilities with various probabilities which have started or will start volume production in 2012 or later.
➢ The reports lists major investments (construction projects and equipping) in 246 facilities in 2012 and in 197 facilities in 2013.
## SEMI Forecast
- Dramatic changes since August 2012

<table>
<thead>
<tr>
<th></th>
<th>Fab Equipment $ for 2012</th>
<th>Fab Equipment $ for 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SEMI WW Fab Forecast</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aug 2012</td>
<td>US$ 36.7B (-5.3%)</td>
<td>US$ 42.8B (16.7%)</td>
</tr>
<tr>
<td>Nov 2012</td>
<td>US$ 32.4B (-16.2%)</td>
<td>US$ 32.4B (0%)</td>
</tr>
</tbody>
</table>

### What happened?
SEMI Forecast
- Dramatic changes since August 2012

What happened?
Examining changes of forecast for Fab equipment spending

- Companies reduce or stop adding new capacity starting mid 2012
- Dramatic changes in fab equipment spending in 2H2012 mainly 3Q12
- Expect slow 1H2013, lowest 1Q13

<table>
<thead>
<tr>
<th></th>
<th>Change % Forecast for 2012</th>
<th>Change % Forecast for 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top 10 fab equipment spenders</td>
<td>-13%</td>
<td>-25%</td>
</tr>
</tbody>
</table>

Most notable changes for:
Samsung, Intel, SK Hynix, Globalfoundries and Flash Alliance
2012 Semiconductor Revenue Forecasts

As of Sept 2012 →

As of Dec 2012 →

Source: SEMI
2013 Semiconductor Revenue Forecasts

As of Sept 2012 ➔

As of Dec 2012 ➔

Source: SEMI September 13, 2012
• VLSI is total semiconductor equipment
• SEMI Fab Fcst (Forecast) is for all Front End facilities: new, used and in house
• SEMI Consensus Fcst is for wafer processing equipment
## Semiconductor Capex Forecasts

<table>
<thead>
<tr>
<th>Source</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMI (Nov 12) (was in Oct for 2012: -8% for 2013 +5%)</td>
<td>-13%</td>
<td>-2% to +2%</td>
</tr>
<tr>
<td>UBS (Nov 12) (was in Sept for 2013 + 6.5%)</td>
<td>-6%</td>
<td>-2.0%</td>
</tr>
<tr>
<td>Barclay (Sept 12) (was for 2013: 0% to +5%)</td>
<td></td>
<td>-5% to 0%</td>
</tr>
<tr>
<td>ICInsight (Nov 12)</td>
<td>-10%</td>
<td>-3%</td>
</tr>
<tr>
<td>Gartner (Aug 12)</td>
<td>-9%</td>
<td>-1%</td>
</tr>
<tr>
<td>Goldman Sachs (Sept 12)</td>
<td>-10%</td>
<td>-10%</td>
</tr>
</tbody>
</table>

### Risk factors
- Eurozone debt crisis
- Slowing economy in China
- US fiscal debt situation
- Turmoil in Middle East

### Some key indicators for our 2013 forecast
- GDP is expected to be slightly higher in 2013 (World bank, IMF)
- Possible new China stimulus (Sept 2012: 1 trillion Yuan (~US$158B)
- General consensus of higher revenue forecast for 2013
- Increased demand for mobile devices such as smartphones, ultraportable PCs and tablets
- Strong demand forecast of NAND Flash Memory
Some Positive Indicators for 2013

**2013 Semiconductor Revenue Forecast:** upper single digits

**2013 Global GDP slightly up**

<table>
<thead>
<tr>
<th>Source</th>
<th>2012%</th>
<th>2013%</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC Insight (Nov 12)</td>
<td>2.6</td>
<td>3.2</td>
<td>0.6</td>
</tr>
<tr>
<td>IMF (Oct 12)</td>
<td>3.3</td>
<td>3.6</td>
<td>0.3</td>
</tr>
<tr>
<td>Deutsche Bank (Oct 12)</td>
<td>2.9</td>
<td>3.2</td>
<td>0.3</td>
</tr>
<tr>
<td>World Bank (June 12)</td>
<td>2.5</td>
<td>3</td>
<td>0.5</td>
</tr>
<tr>
<td>Morgan Stanley (Nov 12)</td>
<td>3.1</td>
<td>3.1</td>
<td>0</td>
</tr>
</tbody>
</table>

*Exponential growth expectation for NAND*

Sources: various companies, includes SSD, tablets, mobile, consumer, other
Revenue and Spending: Same Roller Coaster

Chip Sales, Capex and Fab equipment Spending

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semiconductor capex US$M</td>
<td>60,132</td>
<td>52,299 (was 55,520)</td>
<td>51,292 (was 58,458)</td>
</tr>
<tr>
<td>Change %</td>
<td>25.1%</td>
<td>-13% (was -7.6%)</td>
<td>-1.9% (was 5.3%)</td>
</tr>
</tbody>
</table>

Source: WSTS Nov 2012, SEMI data, SEMI Fab World Fab Forecast reports (November 2012)
# Fab Equipment Spending

## Fab Equipping Spending over Time
(all Front End Facilities)

<table>
<thead>
<tr>
<th>Year</th>
<th>US $ Billion</th>
<th>Change (YoY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>$33,453</td>
<td>+11.6%</td>
</tr>
<tr>
<td>2008</td>
<td>$28,523</td>
<td>-32.1%</td>
</tr>
<tr>
<td>2009</td>
<td>$14,115</td>
<td>-44.1%</td>
</tr>
<tr>
<td>2010</td>
<td>$38,689</td>
<td>+131.0%</td>
</tr>
<tr>
<td>2011</td>
<td>$29,235</td>
<td>+15.5%</td>
</tr>
<tr>
<td>2012</td>
<td>$28,815</td>
<td>-1.4%</td>
</tr>
<tr>
<td>2013</td>
<td>$32,426</td>
<td>+55%</td>
</tr>
</tbody>
</table>

## SEMI World Fab Forecast reports (November 2012)

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Front End equipment (new, used, in-house)</td>
<td>$33,453</td>
<td>$38,689</td>
<td>$32,425</td>
<td>$32,426</td>
</tr>
<tr>
<td>change % all</td>
<td>131.3%</td>
<td>15.7%</td>
<td>-16.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Fab Equipment 300mm only</td>
<td>$28,523</td>
<td>$32,971</td>
<td>$29,235</td>
<td>$28,815</td>
</tr>
<tr>
<td>change % 300mm</td>
<td>128.3%</td>
<td>15.6%</td>
<td>-11.3%</td>
<td>-1.4%</td>
</tr>
</tbody>
</table>
Fab Equipment Spending

Fab equipment spending by product type

(Front End. Showing largest spending types)

Source: SEMI World Fab Forecast reports (November 2012)
Since the downturn the industry spends more money on upgrading existing facilities.
Until 2009, we have never before seen installed capacity with negative change rate (YoY)!

Average Growth Rate 2003 to 2007 (before downturn) was 16%
Average Growth Rate 2010 to 2014 (after peak of downturn) expected at 5% to 6%
Capacity

Worldwide installed capacity by product type
(showing selected types)

Source: SEMI World Fab Forecast reports (November 2012)
**Planned new IC capacity of new volume fabs**
starting construction in 2012 and 2013
excluding Discretes (in 200mm equivalent wafers per month), higher probability

<table>
<thead>
<tr>
<th>Region</th>
<th>2012 capacity (count fabs)</th>
<th>2013 capacity (count fabs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americas</td>
<td></td>
<td>45,000 (1)</td>
</tr>
<tr>
<td>China</td>
<td>364,000 (2)</td>
<td></td>
</tr>
<tr>
<td>Europe &amp; Mideast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td></td>
<td>225,000 (1)</td>
</tr>
<tr>
<td>S. Korea</td>
<td>360,000 (2)</td>
<td></td>
</tr>
<tr>
<td>SE Asia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taiwan</td>
<td>180,000 (2)</td>
<td>157,500 (2)</td>
</tr>
<tr>
<td><strong>SUM</strong></td>
<td><strong>904,000</strong></td>
<td><strong>427,500</strong></td>
</tr>
</tbody>
</table>
Worldwide Installed Capacity for Flash Fabs

By the end of 2016, we expect all known and known-planned Flash fabs to be at full capacity

Source: SEMI World Fab Forecast database (November 2012)
Fab Construction Projects

Count of New IC Volume Fabs Starting Construction
(probability >60%) excluding Discretes/LEDs

Source: SEMI World Fab Forecast reports (November 2012)
Fab Construction Projects

Fab Construction Spending over Time
(all Front End facilities)

In US$ Billion

<table>
<thead>
<tr>
<th>Year</th>
<th>Taiwan</th>
<th>SE Asia</th>
<th>S. Korea</th>
<th>Japan</th>
<th>Euro &amp; ME</th>
<th>China</th>
<th>Americas</th>
<th>Change in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>118%</td>
</tr>
<tr>
<td>2005</td>
<td></td>
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<td>177%</td>
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<td>2006</td>
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<td>-54%</td>
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<td>2007</td>
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<td>-48%</td>
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<td>2008</td>
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<td>27%</td>
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<td>2009</td>
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<td>-15%</td>
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<td>2010</td>
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SEMI World Fab Forecast reports (November 2012)
Fab Status Forecast into 2017
The Industry Consolidates

Chart includes MEMS
Includes here Infineon in Dresden with 300mm thin film fab
Includes 12-inch MRAM fab by Crocus in Russia
Pie chart: expect 94 300mm volume fabs by 2015, 2 more by 2017
Summary

Cautiously optimistic for 2013!

1. **Fab equipment spending (Front End)**
   - 2012: -16.2% (YoY) US$32.4B
   - 2013: 0% (YoY) (US$32.4B), 300mm only: ~28.8B
   Slow start into 2013, pick up in 2Q13, stronger 2nd half 2013

2. **Installed capacity:**
   - 2012: 3.8% (YoY) was 5% in August report
   - 2013: 3.5% (YoY) was 5.8% in August report
   Capacity additions slow even more in 2012 and 2013
   Stronger growth for Foundry, Flash and MPU expected in 2013

3. **Construction spending**
   - 2012: -15.4% (YoY), US$5.6B
   - 2013: 3.7% (YoY), US$5.8B
   -Although 2013 outlook has improved since last report.
SEMI Industry Research and Statistics

Products and data collection programs:
www.semi.org/marketinfo

Contact: Ed Hall: ehall@semi.org or mktstats@semi.org

Other Resources
Industry Articles/Press Releases: www.semi.org/marketinfo
Fab Articles/Interactive Maps: www.semi.org/fabs
Market Research Products: www.semi.org/store
SEMI Member-Only Webinar Archive: www.semi.org/en/node/38101
Twitter: www.twitter.com/SEMI_mktstats
Slideshare: www.slideshare.net/ehallSEMI
YouTube: www.youtube.com/user/SEMImktstats
Thank You!

• Questions?
Upcoming SEMI Events

www.semi.org/events

Executive Programs
• Jan 22-23, 2013: European 3D TSV Summit
• Feb 24-26, 2013: ISS Europe 2013

Webinars
• Dec 13, 2012: Opportunities in the Turbulent Photovoltaic Equipment Market
• Jan 17, 2013: Silicon Photonics: Disruptive Technologies Offer Long Term Potential

Technical Programs
• Mar 10-12, 2013: 7th PV Fab Managers Forum 2013
• May 14-16, 2013: ASMC 2013

Exhibitions
• Jan 30-Feb, 1, 2013: SEMICON Korea 2013/ LED Korea 2013
ISS 2013
INDUSTRY STRATEGY SYMPOSIUM

January 13–16, 2013    The Ritz-Carlton    Half Moon Bay, CA    www.semi.org/issus

The Industry Ecosystem in 20/20: Perils and Opportunities
Perspectives on 3D TSV Benefits in Microelectronics Applications
Laurent Malier, CEA-LETI

3D Integration for Mobile Applications
Georg Kimmich, ST-Ericsson

The Future of Packaging: Advanced System Integration
Ron Huemoeller, Amkor Technology

Advancing High Performance Heterogeneous Integration Through Die Stacking
Suresh Ramalingam, Xilinx

Sessions:
- Cost of Ownership: Process, Equipment and Materials Innovations for Cost Effective Solutions
- Design/Technology/Application Considerations
- Inspection and Metrology
- Manufacturing
- Market Briefing: Powered by Yole Development
- Technologies: Critical Enabling Technology Bricks
- Testability

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Harnessing European Innovation for the Global Market

Join us at ISS Europe 2013
February 24–26
Milan, Italy

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End of Webinar
Backup slides
Difference SEMI’s WWSEMS to SEMI’s World Fab Forecast

SEMI’s Worldwide Semiconductor Equipment Market Subscription (WWSEMS) data tracks only new equipment for fabs and test and assembly and packaging houses. This survey done by a third party covers about 90% of the industry's equipment suppliers.

The SEMI World Fab Forecast and its related Fab Database reports track any equipment needed to ramp Front End facilities, upgrade technology nodes, and expand or change wafer size, including new equipment, used equipment, or in-house equipment. The report covers from small R&D to high volume fabs and includes Discretes and LEDs.

If we compare the equipment data between WWSEMS and Fab database, we are including wafer processing equipment, mask & reticle, and Fab facilities of WWSEMS and compare with Fab database equipment data.
Definition of SEMI Consensus Forecast

SEMI has a long tradition of generating “Consensus Forecasts” for new semiconductor equipment. These forecasts are published two times a year in conjunction with SEMICON West in July and SEMICON Japan in December.

The intent of these forecasts is to provide a gauge of member sentiment for market conditions. SEMI bases this forecast on monthly “bookings and billings” data that it collects directly from semiconductor equipment suppliers, data from the SEMI World Fab database, and feedback from equipment suppliers.

The “Consensus Forecast” covers both “Front-end” equipment (typically associated with wafer fabrication) and “Back-end” equipment (equipment used to package and test individual devices).

The “Consensus Forecast” contrasts to the “bottoms-up” forecast generated by the World Fab database, which bases its projections on CapEx announcements by device manufacturers and only covers fab equipment, including used and equipment manufactured directly by fabs.
SEMI World Fab Forecast for Front End equipment includes new, used and in-house made and includes Discretes and LEDs.
SEMI WWSEMS is for new equipment of participating companies capturing about 90% of the industry.