

# Applied Materials Solar Installations

Bruce S. Klafter, Head EHS & Sustainability

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think it. apply it.™



APPLIED MATERIALS.



External Use

# Our Carbon Reduction Goals



## CORPORATE GOAL

**Applied Materials will cut CO<sub>2</sub> equivalents  
by 20% or 50k tons by 2012**

## PRODUCT DESIGN GOAL

**Applied Materials will reduce energy and resource  
consumption in overall product set by 20% by 2012**

# Applied Materials Products



## Semiconductor



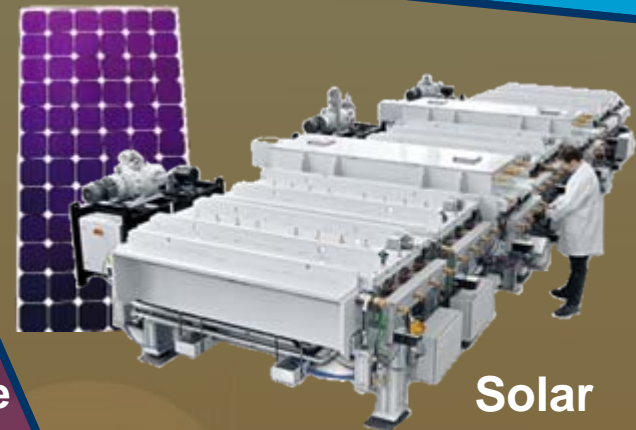
## Services and Software



## Display



## Packaging, Glass and Flexible Electronics



## Solar

# Applied Materials' Solar Business Strategy



## Crystalline Silicon

Preferred for residential applications

- Leverage semiconductor processes into solar
- Improve yield, uptime with automated, integrated solar manufacturing
- Reduce costs by increasing production capacity

## Thin Film

Preferred for large scale applications

- Leverage flat panel display process into solar
- Enable new 5.7m<sup>2</sup> standard for thin film solar
- Lowest cost of production

**Mission: using nanomanufacturing technology to improve the way people live. Objective: 'Cost per watt' parity with retail electricity.**

# Applied Materials SunFab™ Thin Film Line



- The Applied SunFab is a complete production line capable of producing the world's largest thin film silicon modules
- One SunFab line can deliver 50MW~75MW of modules annually
- Modules are glass-PVB-glass designed to comply with IEC 61646 with a module lifetime of >20 years
- Manufacturing cost is estimated to decrease below \$1.00/Wp and efficiency to exceed 10%



# Our Solar Self-Generation Strategy

- In aid of our carbon footprint reduction goal, but other measures may be more cost effective or have greater impact.
- Because we are committed to solar PV as a technology, the program is also aimed at demonstrating that commitment and has marketing value.
- General criteria in planning installs:
  - Owned locations are preferred
  - Regions where our solar business is important
  - Utility rates may make an install more or less attractive
  - Qualification for incentives, where they are available. Some utilities still prohibit customers from self-generation.
  - Utilizing different technologies, now focusing upon thin-film panels manufactured with Applied Materials' equipment
  - Maximum size and output, taking into account site factors, cost, ROI, etc. Maintaining aesthetics of the facility is another consideration.
  - Visible to local communities (i.e. marketing value)
- We have retained all credits to date (to contribute to our reduction goal).

# Sunnyvale, California (1.99 megawatts)



# Sunnyvale Installation Facts & Figures



- Our main R&D campus (worldwide)
- 1.99 Mw – presently largest system in the U.S. on an existing corporate campus; largest single system in the Bay Area.
- 4653 rooftop panels, 3344 panels on trackers covering the parking lot.
- PowerTracker™ system is a single-axis system
- Qualified for both California's CSI and SBI incentives. Former was based upon system size and latter upon output and that drove our planning (use of trackers and high-efficiency modules).
- Awnings required larger footings and construction lasted several more months. Also forced us to alter traffic patterns inside the campus.
- Forced to remove a few trees (with City permission) and to replant to mitigate those impacts.



# Austin, Texas – Xi'an, China



- 24 kW
- Faces Highway 290 in front of our manufacturing location
- One of the largest in Austin
- Austin Energy offers a \$100K max. incentive per account and presently has no other incentives for commercial installations



- 56 KW
- Only installation in Shaanxi Province at the moment.
- Panels are mounted on awnings in front of the facility, again to increase visibility from street.
- No incentives were available.
- Worked with Suntech, one of our Chinese customers

# Future Plans (planned but not approved)



- Singapore – as part of a brand new manufacturing facility, certified under Singapore’s Green Mark Platinum standard (LEED equivalent):
  - Approximately 400 kW, largest on the island
  - 400+ thin-film panels from an Applied customer, 1,000 c-Si panels and 30+ solar skylight panels (10% light transmission)
- Rehovot, Israel (manufacturing, office and R&D location)
  - 267 kW, one of the largest in Israel
  - Proposing to utilize a “multi-solar system” that uses air and water cooling to increase efficiency and that will generate hot water for air reheat
- Xi’an, China (second phase)
  - 750-1000 kW
  - 100% thin-film
- Other possibilities
  - Austin, Texas, utilizing BIPV to take advantage of roof space
  - Alzenau, Germany, solar R&D center, but a leased facility

# Keeping Employees Informed



## LOCATIONS:

Austin, TX, USA  
Sunnyvale, CA, USA

## Aggregate Data For All Systems

### ELECTRICAL PRODUCTION

Today 3364 kWh  
Lifetime 1486.6 MWh

### GREENHOUSE GASES AVOIDED

Lifetime 1,877,237 Lbs CO<sub>2</sub> 560 Lbs NO<sub>x</sub>

The world is changing and at Applied Materials we are taking action to change it for a better, Bright Future. Our Energy and Environmental Solutions group is focused on technology and products that help reduce the need to burn fossil fuels and lower greenhouse gas emissions.

Our technology and know-how can be applied to several key areas to make a difference—to improve the way people live in ways that will be beneficial for each of us, as well as future generations.

Check back to view the difference we are making as we add new solar generating locations!

*View live data by choosing a site below.*



# Applied Materials

Arques Campus  
Tracker / Parking Lot

SYSTEM SIZE: 1.02 MW DC

## Sunnyvale, CA Solar Electric Generation



AS OF: 11:40am, 18 September 2008

Live Data

How It Works



GENERATING 715.20 kW

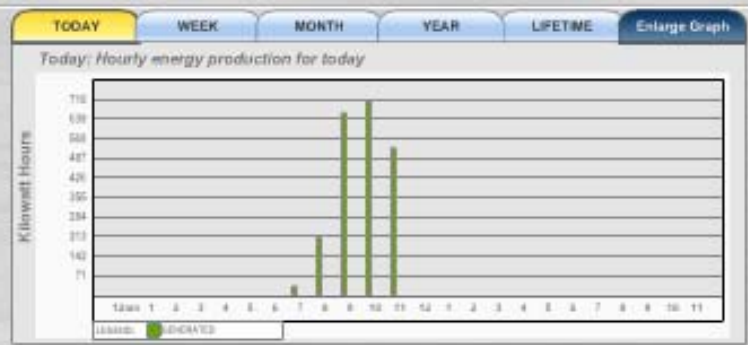


Conditions: A Few Clouds  
Recorded at: San Jose Intl. Airport  
Updated at: Sep 18, 10:53 am PDT  
Visibility: 10.00 mi.



### HISTORICAL

GENERATED 2,083.20 kWh



### ENVIRONMENTAL BENEFITS Since Installation

Greenhouse gases avoided by use of solar energy:

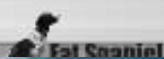
CO2	340,564 lbs
NOx	102 lbs
SOx	9 lbs



We've generated enough power to operate 5,465 homes for 1 day.



We've avoided generating the gases that 12,434 cars emit over 1 day.





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