

from William E. Claycomb

ON THE RECORD

SAVE OUR BAY, INC.

Mike Splinter

The cost of flat-screen TVs has plummeted in just a few years, so Applied Materials CEO **Mike Splinter** sees no reason why the same can't happen with solar energy panels. After all, it's practically the same technology—and now his company, the world's largest supplier of manufacturing equipment to the semiconductor industry, is involved. Applied Materials moved into solar in 2006 with acquisition of a leader in the process of layering thin-film photovoltaic silicon onto glass or another low-cost support material. Less silicon means less cost. And Applied Materials aims to drive down solar costs from about \$4 per watt to \$1 per watt within the next two years and to 70 cents by about 2010, bringing closer the day when sunshine is competitive with other energy sources. Growth has slowed for Applied Materials' core business, chip manufacturing. Splinter spoke with Senior Writer Marianne Lavelle about his company's move into this new frontier.

Companies have long tried to reduce solar costs—what can you do differently?

We've been able to drive down the cost of semiconductors thousands of times in our 40 years in the business. More recently, we've gotten into equipment and technology for flat-panel displays, and I think we've all witnessed the cost dropping. As those industries started to mature, we started to look for new areas in which to utilize our capabilities and technology, and it became apparent that energy and the environment are huge issues of our time and need technologies and need solutions. Our

"The fuel is free. Maintenance of these panels is zero....Solar has all the advantages, except for cost."

technology for flat-panel displays could be used almost directly to make thin-film solar cells. We feel we can do a very good job of increasing efficiency and improving productivity and driving up the economies of scale and do what hasn't been done in solar in the last 30 years.

Why will people buy solar?

The fuel is free. Maintenance of these panels is zero. You can distribute them so you don't necessarily need a large grid. There are no moving parts. Solar has all the advantages, except for cost.

How much of your business is solar now, and how much do you see it growing?

Well, this year it'll be a small percentage. Our company has business of \$9.3 billion, and we'll have [solar] orders for something over \$400 million. But last year it was zero, so that's a relatively good acceleration curve.

You talk about how your traditional businesses have matured—is that why you're looking to new horizons?

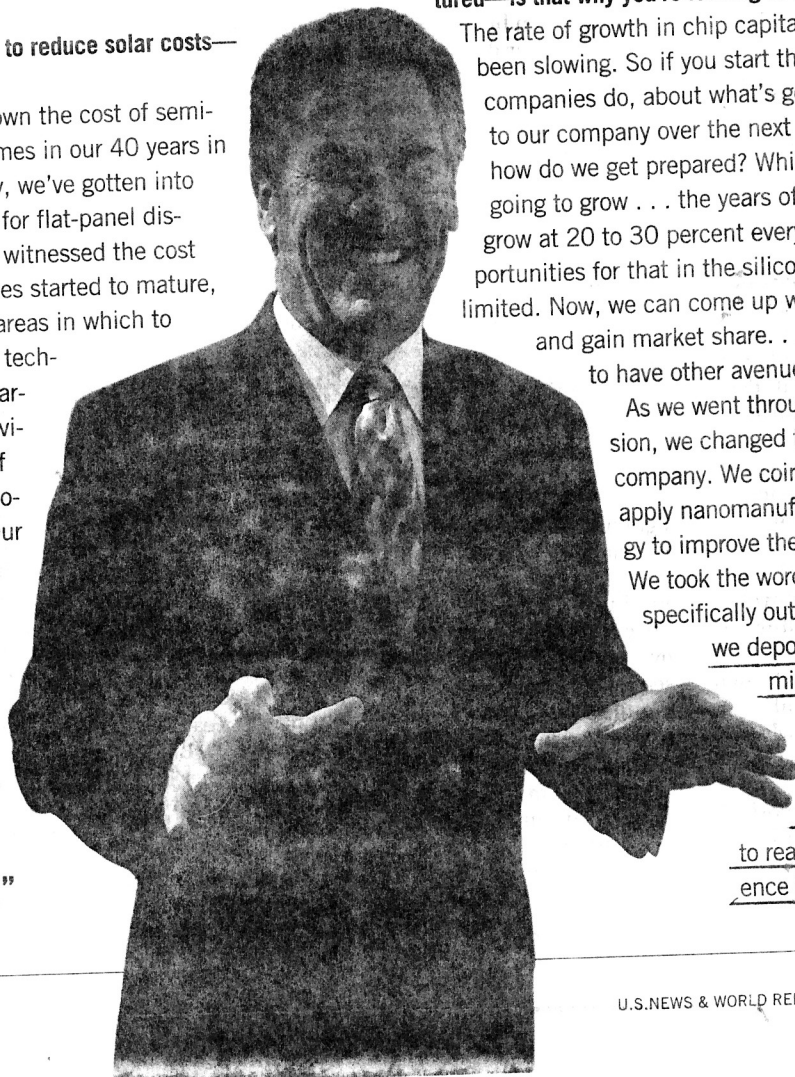
The rate of growth in chip capital spending has been slowing. So if you start thinking, as all companies do, about what's going to happen to our company over the next five or 10 years, how do we get prepared? While chips are going to grow . . . the years of being able to grow at 20 to 30 percent every year—the opportunities for that in the silicon business are limited. Now, we can come up with new solutions and gain market share. . . . But we have to have other avenues for growth.

As we went through this discussion, we changed the vision of the company. We coined a term—"We apply nanomanufacturing technology to improve the way people live." We took the word *semiconductor* specifically out. What we do is

we deposit very thin films, microscopic films

. . . not just for research but to feed the factories of the world,

to really make a difference in the world. •



April 7, 2006

The Energy/Global Warming Solutions
by William E. Claycomb

SAVE OUR BAY, INC

Sam Sadler (July 17, 2000) said Tom McCall, Oregon Governor from Jan. 9, 1967, to Jan. 13, 1975, was a visionary. He was surely that for he oversaw the final printing of "Transition" which was first called just the "energy study". It was a stupendous work of 497 pages.

Unfortunately, "Transition" was sent to the Governor with a letter dated Jan. 1, 1975, just twelve days before the end of McCall's terms.

And again, unfortunately, McCall was not succeeded by a visionary because all that changed as a result of "Transition" was that the "Office of Energy Research and Planning" became just the Energy Office.

What should have changed, had McCall's visions been fulfilled, as outlined in the 36 page, unnumbered Chapter 3:

1. By 2000, in Oregon, natural gas and fuel oil would no longer have been used for space heating, thus saving them for use as chemical feed stocks (page (p)151),

2. By 2025, 80% of Oregon's energy needs would be supplied by electricity with solar electricity being over half the supply. Geothermal plants, using a non renewable source, would have been phased out (p. 153),

3. By 2000, coal plants would have been phased out, again saving the concentrated source of carbon as a chemical feedstock supply,

The forecast cost for 1990 was \$100 to \$300 per kilowatt (kW) for solar panel arrays with commercial production at 1,000,000 kW's per year (p. 156). By 1999, the KPMG/Nederlands study estimated a cost of \$1,063 per kW (more about this study later).

The December, 1973 "The Mitre Corporation" report to the National Science Foundation said that the cost per kilowatt hour (kWh) could be 1 - 1½ cents (p. 160) (What are you paying in 2006?)

"Transition" contained all kinds of interesting information. A "solar farm of 143 square miles (a 12 mile square)" could have, in 1973, produced all 102.4 trillion British Thermal Unit(s) (BTU) used in Oregon. That area was less than one sixth of one percent of the state's land area. (p. 147, 148) The Mitre Corporation, December 1973, report also mentioned that hydrogen produced by photovoltaic (pv) - powered electrolysis could be used as "a storage medium, a fuel gas or an industrial feedstock (p. 159).

The last paragraph of the Jan. 1, 1975, letter sending "Transition" to Governor McCall, worth repeating, is "If the people of Oregon are to establish the conditions for a truly stable future, in a world of mounting stress and uncertainty, an unprecedented application of honesty, intelligence, and responsibility will be required."

The energy and related global warming problems could have been solved in 1975, but with the end of the OPEC crisis, following Secretary of State Henry Kissinger's warning to the Arabs that we would invade and take their oil if the embargo began hurting our economy, people lost interest.

A few people continued efforts to solve our energy crisis.

In 1997, the "MUSIC FM" study was published after being completed by a team of experts from six European countries led by Co-ordinators Dr. T. M. Bruton/Dr. J. M. Woodstock. Team members were from Britain, Germany, Spain, Belgium, Portugal and the Netherlands. Dr. Bruton was Executive Director, Crystalline Silicon Technology at the European Technology Center, BP (British Petroleum) Solar.

The MUSIC FM study concluded that a 500 megawatt (MW) factory, with an MW equaling 1,000 kws, could produce silicon panels for \$1,240 per kilowatt. In an email dated March 26, 2001, Dr. Bruton predicted further cost reductions and raised efficiency predictions.

In August, 1999, "Solar Energy: from perennial promise to competitive alternative - final report." was published by KPMG Bureau voor Economische Argumentatie, Steins Bisschop Meijbur & Co Advocaten. The report hereafter will be referred to as the KPMG/Nederland report (KPMG/N).

The KPMG/N worked with the MUSIC FM study to enlarge upon it and cost various items necessary in the construction of the 500 MW plant.

The KPMG/N stated that:

1. The exchange rate: Euros for dollars was \$1 = .8597 Euros (p. 26)
2. Photovoltaic solar energy provides almost 20 times more energy per hectare than biomass (p. 15).
3. A 500 MW plant produces enough panels to supply 100,000 houses with a year's supply of solar energy (p. 20).
4. Panels would cost \$1,063/kW (p. 27). Installation would cost another \$911 (p. 25) for a TOTAL of \$1,974.

5. kwh hours would cost 7.8 cents (p. 26) at the latitude of San Diego.

6. The 500 MW capacity factory would cost \$735 million including a plant for the production of solar grade silicon (p. 24).

7. The investment would return 13% in the first year increasing to 15% in the 5th year (p. 25).

8. The factory would employ approximately 2,000 people (p. 24).

Electricity at 7.8¢ per kwh is cheaper, for houses with panels on their roof tops, than any other source, because no transmission and distribution charges are necessary.

According to "Transition", Jerold Noel, with Mobil Oil/Tyco, the roof top of an average Philadelphia house could satisfy the energy needs of the home with enough energy excess to charge an electric car (p. 161). Assuming that the extra for the car is also electrolyze enough hydrogen for a fuel cell car, this with a 5 kw capacity in San Diego would do the same. General Motors can start producing fuel cell cars modeled after its "AUTONomy" according to their Jan. 7, 2002 press release found at the GM web site. Various foreign automakers are also producing fuel cell automobiles.

Christian society, with the means at hand to solve our energy and global warming crises, it is inconceivable why we have not done so.

It would be that the \$8,000,000 that Exxon Mobile has contributed to more than 40 "think tanks" the "preach skepticism about the possibility of a (global) warming climate catastrophe" could have been used to promote our Christianity. (Mother Jones/May/June 2005, p. 40).

Exxon Mobile had driven to remove Robert Watson from his post as chairman of the United Nation's Intergovernmental Panel on Climate Change because Watson was doing too good a job and recommending a shift away from fossil fuels (Pittsburgh Post-Gazette, April 25, 2002).

We can find somebody with an "unprecedented application of industry, intelligence and responsibility", maybe we can, for example, get that 500 MW photovoltaic factory, with its side silicon factory, built.

For comparative purposes, Ken Zweibel, manager of the Thin Film Partnership at the Golden, Colorado, National Renewable Energy Laboratory was contacted. Zweibel said,

1. A square meter of thin film PV could produce 100-150 kwh (about the same as found by the MUSIC FM and KPMG/N studies) conventional panels.

2. Presently, installation in Europe has been done at a cost of \$4,500 per kw.

3. Ultimately the cost might be reduced to \$1,500 - \$2,000, installed, per kilowatt approximately the same as for the KPMG/N cost of \$2,080 (\$1,974 inflated from 1999 to 2006).

With the proper persuasion will Governor Schwarzenegger be the man to build the 500 MW factory NOW not waiting for the uncertain future of thin film ??

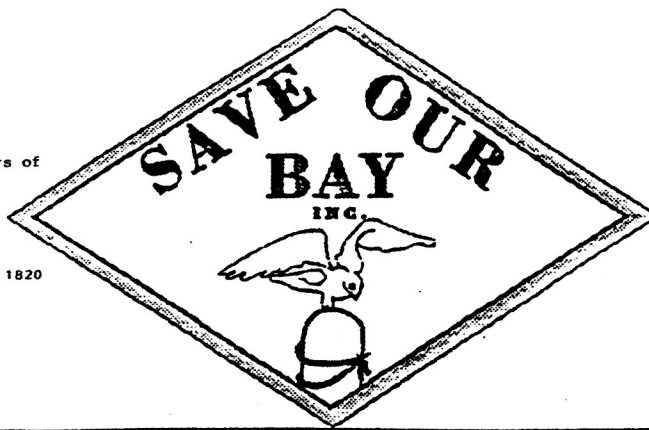
NOTE: On April 6, 2006, the San Diego Union-Tribune (p. C7) Foreign Exchange showed \$1 equaling .8136 Euros, a 5.36% decrease in the value of \$1 since 1999. Costs previously listed in dollars above for the KPMG/N study would therefore have to be increased by 5.36%.

William E. Claycomb

2/22/2008 \$1 = .675 Euros See l. on p 2 $.860 \div .675 = 1.27$
 therefore 1974×1.27 becomes 2,507

7/28/2007

now no safe depository of the ultimate powers of
 society but the people themselves; and
 think them not enlightened enough
 to exercise their control with a
 wise discretion, the remedy is
 not to take it from them but to inform their
 discretion.
 Thomas Jefferson
 September 28, 1820



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409 Palm Ave. Ste 100
 Imperial Beach, CA 91932-1163
 July 28, 2007

Certified Mail #7006 2150 0001 0379 1455
 Return Receipt Requested

Hon. Dian Gruneich, Commissioner
 California Public Utilities Commission
 505 Van Ness Avenue
 San Francisco, CA 94102

*See note on
 attached p. 2.*

Dear Commissioner Gruneich:

I am writing about SDG&E's application to build the \$1.3 billion
 Sunrise Powerlink.

I can think of no more immoral way to spend any amount of money,
 much less \$1.3 billion.

I am sure you are aware of:

- 1, Solar World AG's plans to build a facility to
 manufacture 500 MW of mono-crystalline solar silicon panels
 in Hillsboro, Oregon, with State support from its Anti-Global-
 Warning Program (Ref. DGAP News-Service, 7/3/2007)
2. Applied Materials CEO Mike Splinter's plan to produce
 thin-film photovoltaic panels for \$1,000 per kW within the next
 two years and for \$700 by about 2010. (Ref.: U.S. News and World
 Report. June 25, 2007, page 59)
3. All that you can learn about
 Copper-Gallium-Indium-Diselenide solar cell (Ref.: Computer
 search for nanosolar)
4. The SAVE OUR BAY, INC., March 11, 2007, letter to the
 Hon. Michael R. Peavey. In it was mention of a 500 MW
 photovoltaic manufacturing plant that could have provided solar
 cells for \$1,063 per kW (installation cost: \$911) (those costs
 were calculated when \$1 equaled .8597 Euros; with \$1 now worth

.7230 Euros, the kW panel cost would now be \$1232. It's too bad we didn't build that factory in 1999.)

With all these latest developments and costs of solar panel production, SDG&E should go into the business of publicizing them and convincing people to put affordable panels on their roof tops. Then SDG&E would really be a public service company. They could even use some of that \$1.3 billion to loan people the money for the installations. Maybe SDG&E could get into the installation business themselves.

In any event, if SDG&E's draft EIR doesn't include a thorough evaluation of the alternative "local roof top solar panel installation", it will be deficient and engender all the necessary lawsuits to see that it does include that alternative.

Sincerely,

William E. Claycomb
William E. Claycomb
President and CEO

NOTE

4/8/2008

This July 28, 2007, SAVE
OUR BAY, INC. letter to the
Hon. Dian Grueneich,
Commissioner, should be
considered as comment on
on SDG&E's draft environmental
impact report on the Sunrise
Beverly Hills.

William E. Claycomb