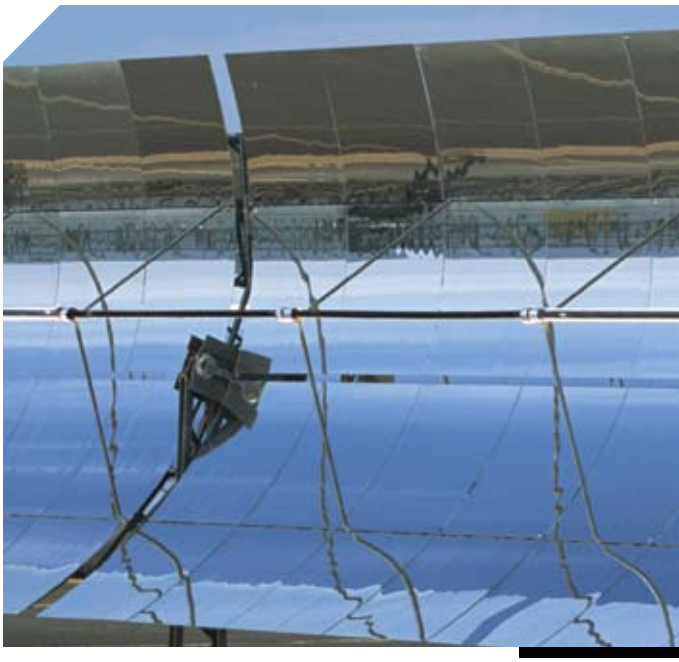
guest opinion

Solar Gains Momentum

TECHNOLOGY READY TO STAND ON ITS OWN WITHOUT GOVERNMENT SUBSIDY

John P. Thornton



EXCITING DEVELOPMENTS ARE taking place in the world of photovoltaics or PV. Developed by Bell Laboratories in the 1960s and launched as a device to revolutionize rural telephone service, PV was for many years a star performer for aerospace and military applications. Although the cost was high at thousands of dollars per watt, PV was the simplest, most cost-effective means to power spacecraft and many remote military applications.

Dramatic changes have occurred since those formative days. PV followed the path of typical emerging technologies, initially being used for small, remote applications such as water pumping, lighting, and off-the-grid residences. Its characteristics of light weight, high reliability, relatively low maintenance, and especially its ability to operate independently from the grid and fossil fuels, soon made PV an ideal power source for many high-value applications, such as telecommunications. During the 1990s, PV was used increasingly in grid-tied residential and commercial building applications. As new applications continued to emerge, new cell technologies and module designs appeared, showing improved performance, higher reliability and much lower manufacturing costs. Sales increased, followed by increased production. Each cumulative doubling of production resulted in about a 20 percent reduction in the cost of PV.

Global market growth has averaged 45 percent annually from 2001 to 2005, with world demand exceeding world supply. World production is no longer measured in kilowatts, but in gigawatts, with 1.7 gigawatts produced in 2005. PV and related equipment sales were reported to be as high as $14 billion in 2005, of which the U.S. share was 8.9 percent.

There is growing confidence in the ability of PV technologies to meet the rigorous standards of utility operation. Tucson Electric Power's 4.6-megawatt plant at Springerville, Ariz., constructed in 2001-2002, has demonstrated an availability of 99.72 percent or greater. The site is unstaffed and is remotely monitored and controlled.

As of June, there were more than 100 grid-connected PV systems in the world rated at one megawatt or greater. Sixteen of these are in the United States and more are on the drawing boards. Xcel Energy is soliciting bids for a PV plant in Colorado that will produce 13,700 megawatt-hours of electricity per year. The 62-megawatt Girrasol project in Portugal, currently in the planning stages, will be six times larger than any PV plant currently in existence.

But the really exciting news is the rapidly increasing interest by bankers and venture capitalists. Advocates have long dreamed of a time when PV and other renewable technologies would be adopted and financed on a large scale by the private sector.

Federal investment in PV has paid off handsomely. While PV research is still supported by the federal government, the private sector is now investing three to five times as much.

Last March, the Cleantech Venture Network announced that a record $502 million was invested in renewable energy during the fourth quarter of 2005, an increase of 59.8 percent over the previous year. Such investments during 2005 totaled more than $1.6 billion, up 34.9 percent over 2004. While little of that has financed PV projects to date, all indications suggest that is about to change. Energy security, the high cost of upgrading the grid to meet 21st century reliability requirements, and global climate change are just a few of the issues fueling the interest. Inquiries about PV received at the National Renewable Energy Laboratory from venture capitalists have increased dramatically since the beginning of 2006.

This is only the beginning for PV. Some market analysts predict worldwide annual sales may reach $40 billion by 2014.

"The really exciting news is the rapidly increasing interest by bankers and venture capitalists."

John P. Thornton *recently retired from the National Renewable Energy Laboratory after 28 years. He has worked on photovoltaics for 43 years.*

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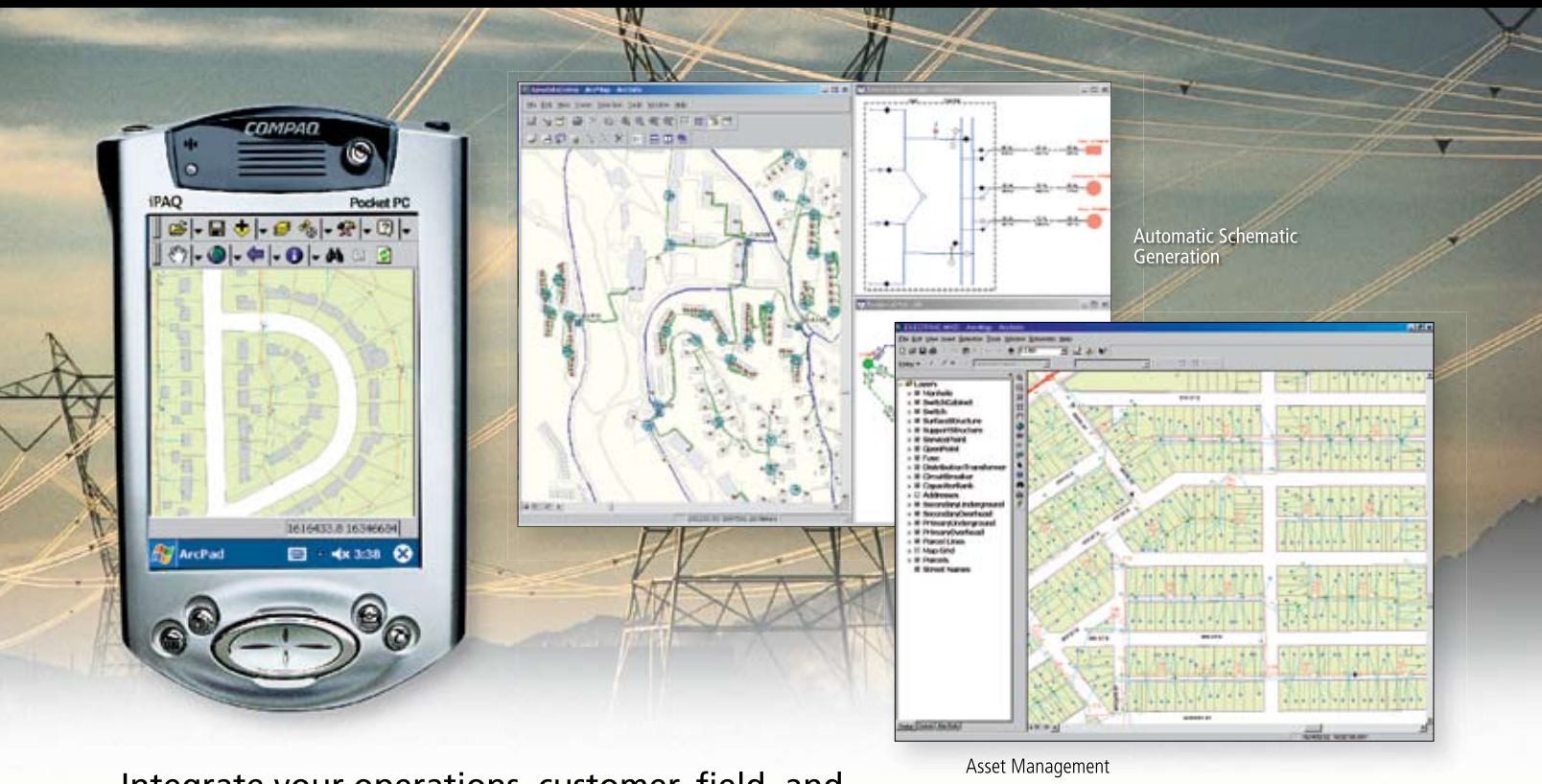

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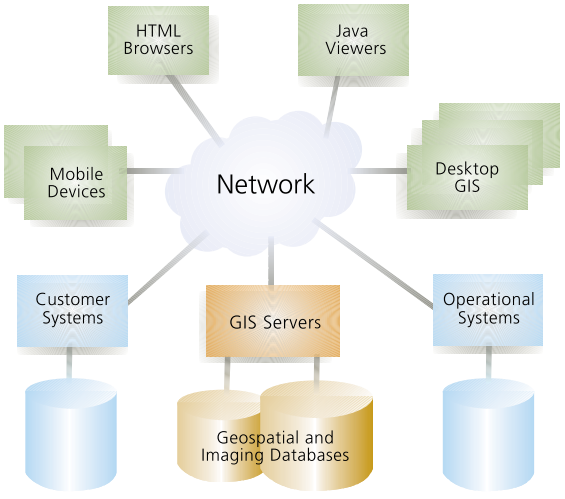

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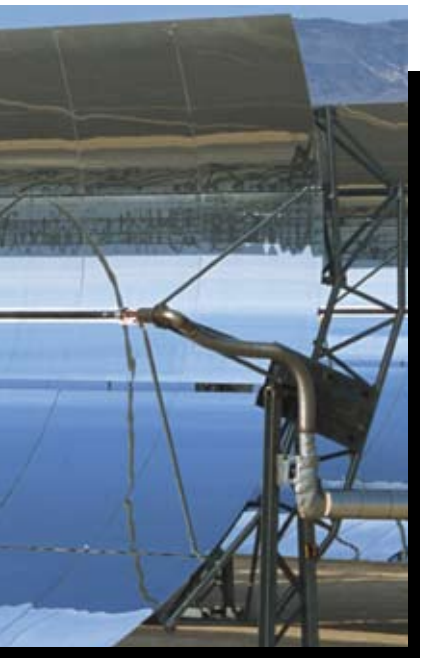

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PORTUGAL SOLAR

GE Energy Financial Services, PowerLight Corp. and Catavento are building an 11-megawatt solar plant, reportedly the world's largest, in Serpa, Portugal, southeast of Lisbon.

The project is valued at $75 million.