

Power Surge

As global demand for **ENERGY** continues to rise, renewable sources are playing an increasingly important role — environmentally and financially.

In the early 1960s, the world's population topped 3 billion. Today it has reached 6 billion and is expected to grow to 9 billion by 2050. Energy demand has grown 15 percent during this century and is expected to increase by as much as 60 percent by 2030.

To keep up, renewable energy such as wind power, solar power, and biofuels will play a greater role than ever before in energy management for the future. Our worldwide demand for energy will boost renewable energy to what industry analysts predict will be a \$167 billion global market by 2015.

In fact, renewable energy is so important that the United States

Congress has recently introduced a bill that would require utilities across the nation to generate 20 percent of their electricity from clean, renewable sources such as, wind solar, geothermal, and biofuels by 2020.

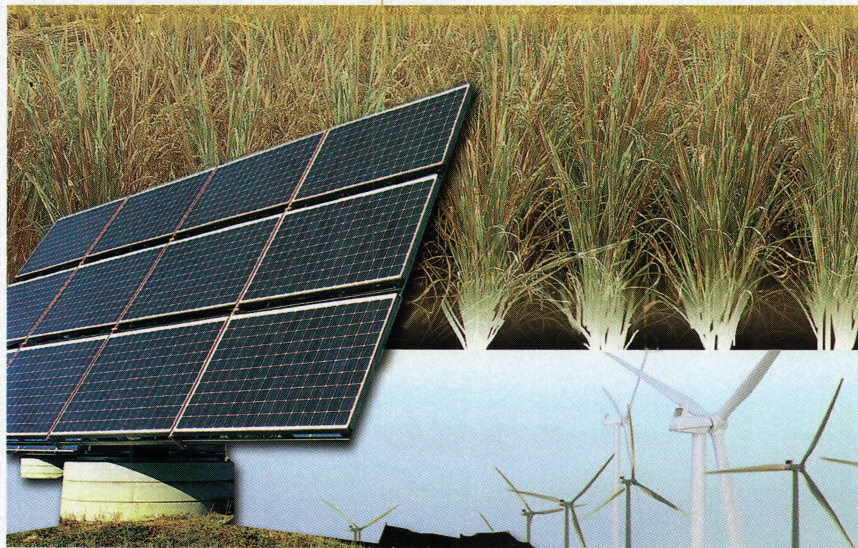
Partnering for Solutions

With rising energy costs, and the need to find cheaper, more abundant, and environmentally friendly sources of power, many forward-thinking companies are joining together to help solve energy problems. World Resources Institute's Green Power Market Development Group, a nonprofit think tank in Washington, D.C., focuses on helping companies that want to work together in exploring, pursuing, and implementing renewable energy projects. Current members include Starbucks, Alcoa, Staples, Pitney Bowes, and FedEx.

"The idea is to get a group of intelligent energy managers together from some of the nation's leading companies and find ways to make it easier to switch to renewable energy for their facilities," says Craig Hanson, senior associate for Green Power Marketing.

One of the most popular forms of renewable energy that Green Power members are using is landfill gas, which consists mainly of methane and carbon

By CYNTHIA SCANLON



dioxide and is produced when organic wastes decay in landfill sites. DuPont and General Motors are leading the way in using this energy for their industrial operations. "The cost of landfill gas is much cheaper than natural gas, and you can sign 20-plus year contracts," says Hanson.

Georgia Power is using landfill gas as its primary source for its Green Energy program. The utility's new landfill gas generation facility at DeKalb County's Seminole Road facility consists of two 1.6-megawatt generators that have the ability to produce 24 million to 25 million kilowatt hours of electricity annually, enough energy to power more than 2,000 homes.

Winds of Change

Wind power has also become a serious alternative energy source.

- Texas ranches now produce 2,631 megawatts of wind power, roughly 25 percent of the United States' total wind capacity — enough to power 650,000 homes.

- The American Wind Energy

Association predicts that by 2015, farmers and rural landowners could pocket between \$100 million and \$200 million by renting out their land to wind turbines.

- Nebraska Public Power District (NPPD) has invested more than \$90 million in wind generation since 1995. In 2005, they installed 36 wind turbines near Ainsworth, Nebraska. Known as the Ainsworth Wind Energy Facility, the environmentally-friendly towers rise 230 feet into the air, turning 131 foot blades. The resulting energy generates enough power for 19,000 homes a year, making it one of Nebraska's largest wind-generating facilities.

- FirstEnergy, a utility headquartered in Akron, Ohio, has also focused its alternative energy eye on wind power. "We have about 315 megawatts of wind power under contract, mostly in Pennsylvania," says Mark Durbin, spokesperson for FirstEnergy. "Of that 315, we have 30 megawatts producing from a wind farm in Somerset County, Pennsylvania, and we have another 80

megawatts that we hope will be producing shortly." The remaining wind power projects FirstEnergy has under contract should come to fruition in 2008. "The 315 megawatts makes FirstEnergy one of the largest renewable energy suppliers in the region, based on wind," says Durbin. Fully operational, wind power will supply more than 189,000 homes in the Pennsylvania region.

- Rochester Gas & Electric (RG&E) offers NewWind Energy, a product of Community Energy, Inc., to those customers who want to affirm and strengthen their commitment to the environment. Companies can incorporate NewWind Energy into their organization's power mix, regardless of who supplies their electricity, and customers can purchase anywhere from 5 to 100 percent of their power from wind turbines. In addition to the cost savings, they will also receive a certificate that documents ownership of air emission and carbon reduction credits.

Wind, however, is not without its drawbacks. There is the issue of

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harming birds which may get hit by the turbines, although Hanson says that the wind industry has vastly improved its technology to prevent this. Of greater concern is Mother Nature; the wind just doesn't blow every minute of the day. Perhaps the greatest challenge, and this applies to most renewable energy sources, is the problem of distribution. "You can put a lot of wind generators in North Dakota, but then you have to find a way to effectively pipe it back to major urban areas, and that's very expensive," says Erich Landis, director of environmental initiatives at Cadence Network.com.

Hanson agrees. "The areas where there are lots of good resources for renewable energy are often remote from population sources," he says. "How do you get it to the big population centers? The government is working on that." Landis says that part of the distribution solution will reside in distributive generation — smaller facilities in more places: "That will take a lot of pressure off the existing grid."

A Sunny Disposition

The solar market industry is also receiving huge amounts of investment capital to grow an industry that is exploding. There is currently an \$11 billion worldwide market in solar energy, with businesses nationwide taking part. Consider these examples:

- Google is planning to install 9,200 solar cells on its 1 million-square-foot "Googleplex" located in Mountain View, California. Google is hoping to cut its electricity bills by 30 percent. The project is thought to be the largest solar power project undertaken by a U.S. company.

- Staples receives about 15 percent of its electricity from solar panels installed on its two distribution centers in California. The move to solar has been so successful that the company has also installed solar panels on an office building in Englewood, New Jersey.

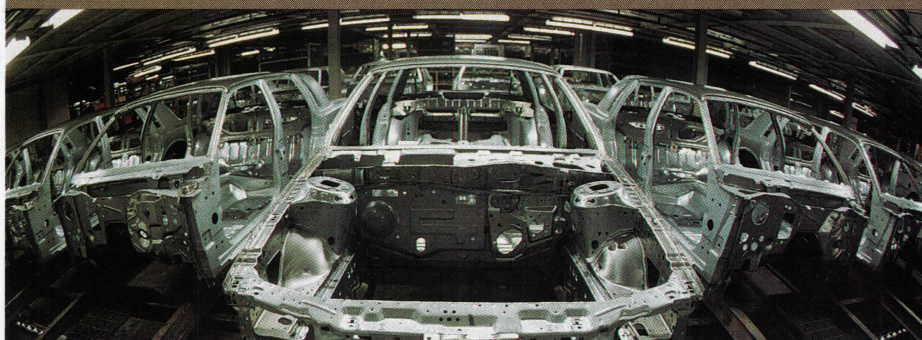
- General Motors has installed photovoltaic (PV) solar cells on its parts warehouse in Cucamonga, California. The installation will generate as much as 1.5 million kilowatt hours of elec-

tricity a year, half of the building's electricity. GM officials expect the company's electricity bill will drop by as much as 10 percent per year.

Many utilities across the nation are exploring solar energy as a viable green alternative. For instance, Arizona Public Service (APS), which serves more than 1 million customers in 11 of Arizona's 15 counties, has developed the Solar Research and Testing Center (STAR), one of the largest solar research facilities of its kind in the United States. "We realized we needed a way to better understand how we could use solar energy here in Arizona," says Peter Johnston, manager of Technology Development Group at APS. "STAR is home to some of the latest solar concentrating photovoltaic and solar tracking technologies. The goal is to produce solar electricity reliably and as cheaply as possible."

Buckeye Power, headquartered in Columbus, Ohio, has partnered with Butler Rural Electric Cooperative and Miami University, both in Oxford, Ohio, in a unique solar-powered

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research project: A 230-square-foot panel and specialized data monitoring equipment were designed to serve as an educational tool for students and for the public on the potential value of solar energy in producing power.

"This project will make a valuable contribution to the community at large in understanding solar PV," says Tony Ahern, Buckeye Power president and CEO. "That's why we felt Miami University would be an ideal partner in helping to shed light on this technology. And the reach of that light will be greater than just here at Butler REC and in the university community."

Last October, Santee Cooper of South Carolina and Coastal Carolina University (CCU) dedicated the first solar PV project at a public university in the state. Solar panels producing 16 kilowatts sit atop four new multipurpose pavilions on East Chanticleer Drive in Conway, a major CCU campus thoroughfare. "Last year, we announced a five-year, statewide and multi-tiered plan that, for the first time in its history, would add solar, wind and small-landfill energy to our mix of renewables," says R.M. Singletary, senior vice president of corporate services for Santee Cooper. "The solar pavilion begins the implementation of that strategy."

The \$385,000 project is capable of producing 16 kilowatts, which is enough to supply power to more than 75 computers. Construction took approximately eight months and included special metering equipment that produces real-time statistics on how much electricity is being generated at any moment. A specially designed Web-based kiosk at the campus' science center includes real-time energy output information from this facility.

Farming for Fuel

Ethanol, once thought to be the least viable of renewable energy sources, is now taken very seriously. Currently, there are 106 ethanol plants operating around the United States, with a combined capacity of 5.1 billion gallons, according to Renewable Fuels Association. The interest in ethanol has been driven, in part, by cost. Today, according to Credit Suisse First Boston's energy group, it costs \$2.60 to

make a gallon of gasoline with crude oil priced at \$70 per barrel. At that same price, it costs half that amount to produce a barrel of ethanol.

The U.S. farm community, particularly in the Midwest, will be a great beneficiary in the increased use and production of ethanol and other biofuels. "Many agriculture-related industries are benefiting from the increased revenue," says Ken Lemke, an economist with NPPD. "One of the things that we like about renewable energy, especially in Nebraska, is that it has had the ability to bring these additional revenues to smaller communities."

And the revenue is impressive. Corn, which is the basic ingredient in ethanol, has been historically set around \$2.00-\$2.50 per bushel since the 1970s. With the increased demand for ethanol, a bushel of corn could rise to more than \$3.00 per bushel, putting an additional \$9 billion in farmers' pockets. And biofuels and wind investment could create more than 250,000 jobs within the next 10 years, mostly in non-urban areas.

These revenues are not lost on the farming community, according to Hanson. "The farmer is starting to look at their land as not just something that creates crops for food," he says. "As more farmers become aware of the potential for [growing renewable energy], you'll start to see more diversification of farm income." Landis agrees. "You are going to see a rebirth of the smaller rural communities," he says. "There is an almost 'dot-com' boom in half of Iowa's small towns because they are building ethanol plants all over the place."

The Future of Renewable Energy

For those companies thinking about switching part of their energy consumption to green power, Hanson recommends talking with companies that have already done so. "It doesn't hurt to have someone come in and help you think through some of your options in terms of available resources," he says. He also reminds companies that finding a renewable energy opportunity is all about location, location, location; and he advises asking questions: What is the energy demand for your facility? Is it

power or heat? Do you need power in the daytime or the nighttime?

"You are more likely to consider a sun project in Arizona than in Minnesota," says Hanson. "You are more likely to consider a wind project in the Great Plains or Texas, rather than in Georgia. California is a great place because you have good solar incentives and high electricity rates."

According to Durbin, many think a multipronged approach will be the most viable way to provide the energy we will need in the future: "We are always going to have a need for coal-fired and nuclear power plants that provide base-load energy, so it's all about balance."

Hanson also sees companies not only consuming, but generating energy in the future. "They will install solar

panels and generate electricity that they send back to the grid," he says. "And they'll make money doing it. That's where we are heading." In the end, he feels it is going to take the commitment of the government to move us along a truly viable renewable energy path. "We can solve our energy problems, but will we? Answering that will take a lot of political will." **AREA**

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