IREC
INTERSTATE RENEWABLE ENERGY COUNCIL

The *IREC Interconnection Newsletter*
September 2004
Vol. 7, No. 9

Editors: Rusty Haynes and Steve Kalland
N.C. Solar Center, N.C. State University

HOW TO SUBSCRIBE

NEWS FROM THE STATES

NATIONAL NEWS

INTERNATIONAL NEWS

INDUSTRY NEWS

PUBLICATIONS AND ANNOUNCEMENTS

PEOPLE

EVENTS...

HOW TO SUBSCRIBE

The *IREC Interconnection Newsletter* is published electronically every month by the Interstate Renewable Energy Council and the North Carolina Solar Center.

To subscribe, go to http://www.irecusa.org/connect/newslettersub.html and fill in the subscription form; then click “subscribe.” There is no subscription fee. To unsubscribe, fill in your email address and click “unsubscribe.” Send comments or relevant news items to Steve Kalland of the North Carolina Solar Center at steve_kalland@ncsu.edu.

NEWS FROM THE STATES

(1) CALIFORNIA - White Paper Makes Recommendations Regarding DG Proceedings

Staff of the California Energy Commission (CEC) and the California Public Utilities Commission (CPUC) has published a white paper to assist the two commissions' efforts to identify the costs and benefits of distributed generation (DG) as a priority issue for the CPUC's new rulemaking, R.04.03.017 and the CEC's parallel proceeding, 04-DIST-GEN-1. The staff of the CPUC and the CEC seeks to improve the commissions' efforts to promote the deployment of DG in the state. The 24-page white paper, titled *Distributed Generation Costs and Benefits Issue Paper*, offers several recommendations to the two commissions with respect to California's DG proceedings, including the following:

- Develop a definition of DG;
- Consider proposed process steps for identifying, quantifying and unlocking costs and benefits;
- Develop common models to assist utilities and other stakeholders in determining the high-priority costs and benefits;
- Require utilities to make publicly available their capital distribution investment plans;
- Establish a mechanism whereby utilities compensate DG customers who help reduce system losses;
- Require utilities to compensate DG customers who provide certain benefits to the utility system, including eliminating system losses, deferring capital transmission and distribution projects, and reducing the need for ancillary services; and
- Require utilities to partner with the CPUC to validate a systems-level model and approach that optimizes the transmission and distribution system.

(2) IOWA - Report Recommends Adoption of IEEE 1547

A recent report conducted by Resource Dynamics Corporation (RDC) for the Iowa Department of Natural Resources recommended that the state expand distributed generation (DG) interconnection rules to include non-renewable forms of DG. Iowa's current interconnection rules cover only "alternate energy production" (AEP) facilities and "qualifying facilities" (QFs).

The report, titled *Defining Iowa's Standards for Interconnection of Distributed Generation*, examined technical and economic issues associated with interconnection procedures currently in place in Iowa. The report also recommended that Iowa adopt IEEE Standard 1547.

The Iowa Department of Natural Resources engaged RDC to investigate issues related to interconnection in the state. To obtain a copy of the report, contact the *DG Monitor*.

(Source: *DG Monitor*, June/July 2004)

(3) MASSACHUSETTS - DTE Exempts Some DG from Standby Charges in NStar Territory

The Massachusetts Department of Telecommunications and Energy (DTE) has issued an order in a case (DTE 03-121) involving NStar Electric's proposed standby charges for new distributed generation (DG) systems. The order, issued July 23, 2004, exempts through August 1, 2008, certain types of DG systems from standby charges that will take effect December 31, 2004. Included in this exemption are (1) DG systems 250 kW and under, (2) DG systems between 250 kW and 1,000 kW that normally satisfy less than 30% of a customer's load, and (3) most renewable-energy systems, including PV, wind, fuel cells, landfill gas, hydro and biomass.

In its 64-page order, the DTE noted that the exemption will increase the number of DG facilities using renewable-energy technologies in NStar Electric's service territory. The order also stated that the exemption could have the effect of increasing fuel diversity and encouraging the development of new renewable-energy projects that could make more renewable-energy credits (RECs) available to retail electric suppliers in order to meet their procurement obligations under state law.

The case involved a settlement among an extensive laundry list of full intervenors and limited participants, including the Massachusetts Attorney General, Harvard University, Boston Public Schools, Polaroid, General Electric, Plug Power and the Massachusetts Division of Energy Resources.

(Source: Massachusetts DTE order, 7/23/04; Clean Energy States Alliance memo, 8/3/04)

(4) NEW JERSEY - BPU Poised to Adopt Expanded Net Metering Policy

The New Jersey Board of Public Utilities (BPU) recently conducted a final public meeting on its proposed amendments to the state's net metering and interconnection rules, which, according to the BPU, will be adopted imminently. The informal meeting, held September 2, 2004, served solely to ensure that the final rules address specific safety concerns raised by some stakeholders who commented on the BPU's proposed amendments.

The proposed amendments were published in the New Jersey Register on December 1, 2003. The BPU seeks to raise the state's net metering limit to 2 MW for all "class I" renewable energy technologies (defined as wind, solar, fuel cells, ocean, sustainable biomass and landfill gas). The BPU also proposed a simplified interconnection standard to accommodate systems with a maximum capacity of 2 MW. Provided the proposed amendments are adopted, New Jersey will become the new national leader in net metering, eclipsing California's standard of 1 MW.

(5) NEW YORK - PSC Establishes Terms for Delivery of Gas to Residential DG Customers

On August 4, 2004, the New York Public Service Commission (PSC) issued an order establishing parameters for rates for residential distributed generation (DG) service to be charged by local natural-gas distribution companies (LDCs). The PSC directed LDCs to file tariff amendments consistent with the new parameters.

In April 2003 the PSC directed LDCs to file tariffs establishing firm rates for natural gas service to commercial and industrial customers with DG systems. The April 2003 order also initiated the development of gas delivery rates for residential customers using natural-gas-powered DG units.

Stakeholders were invited to submit comments on proposed residential rates, service terms and conditions. Several utilities and Plug Power submitted comments.

In its August 2004 order, the PSC ruled that residential DG customers with four or fewer units are permitted to use one meter for combined gas usage. In addition, the PSC rejected a proposal by two utilities to delay the implementation of residential DG rates until at least January 2005, stating that the arguments supporting additional delay were "not persuasive." As a result, LDCs were ordered to file gas service rates for residential DG customers within 90 days of the order.

Furthermore, the PSC determined the following:

- Residential rates should continue after an initial three-year period and be updated as necessary to reflect the results of load research collected while they are in effect;
- A 50% load factor for all gas used by a residential DG system is a reasonable starting point for designing residential rates;
- Computer-based analysis is acceptable in order for LDCs to verify that a customer's actual gas consumption is consistent with the expected pattern of consumption for a residential DG unit;
- The proposed DG rate structure should take effect for all residential DG customers with four or fewer units;
- Seasonal differentials should not be implemented for small residential DG customers at this time;
- Utilities may petition for authority to defer any net lost revenues if DG customers provide lower revenue than standard customers; and
- LDCs should collect usage, load factor and other operating data.

For more information on this order or case (02-M-0515), contact the New York PSC.

(6) OHIO - State Issues Fuel Cell Roadmap

The Ohio Department of Development has released the *Ohio Fuel Cell Roadmap*, a five-year, strategic guide to maximize Ohio companies' involvement in the fuel cell industry. The *Roadmap* includes the programs and activities that the state must emphasize to create an environment that supports the research, development and early commercialization of fuel cells.

"The next five years are a critical time for the fuel cell industry as it moves from the development stage to the commercialization and application stages," said Ohio Development Director Bruce Johnson. "By creating a roadmap with defined strategies that leverage our strengths in manufacturing while also encouraging research and development of new innovations, we are positioning Ohio to take advantage of this burgeoning industry."

According to the *Roadmap*, Ohio must focus on two major goals: growing the fuel cell cluster and stimulating early market demand for fuel cells. The *Roadmap* outlines the following strategies Ohio must undertake to accomplish these goals:

- Support current fuel-cell companies. Provide assistance to the Ohio Fuel Cell Coalition during the technology development and early commercialization periods of fuel cells.
- Build the future Ohio value chain. Identify Ohio manufacturers who have the potential to participate as suppliers, encourage leading fuel cell companies to partner with Ohio manufacturers, and provide the necessary training for workers to support the fuel cell industry.
- Attract new companies. Establish contact with out-of-state companies looking to expand and make them aware of the state's resources and commitment to fuel cells.
- Support technology development. Foster the fuel cell research by Ohio companies and academic institutions by facilitating the transfer of technology from universities to industry.
- Demonstrate innovative technologies. Focus demonstration projects on technologies with a large Ohio content to enhance Ohio's image as fuel-cell leader.

- Support early market adoption. Purchase and install commercial fuel cells at state facilities, support early adoption of fuel cell technology through tax incentives and encourage the creation of standards for the fuel cell industry.

"There are many avenues within the fuel cell industry that a state can travel down, and understanding which ones hold the most economic feasibility will be critical not only to the industry within that state, but also to the nation," said Bob Rose, executive director for the U.S. Fuel Cell Council. "Ohio's forward-looking *Roadmap* illustrates an acute awareness of its existing assets in fuel cell research and commercialization, and shows the state's commitment to cultivating an even stronger fuel cell economy in an already technology-rich location."

Johnson said that Ohio will pursue these objectives as part of its overall Third Frontier Project, a 10-year, $1.1 billion endeavor created to expand high-tech research capabilities, promote innovation, encourage company formation and create high-paying jobs in the state. Over the last two years, Ohio has invested more than $30 million in various fuel-cell-related projects throughout the state.

"Focusing our resources on these goals and strategies will enable the state of Ohio to become a national leader in the research, development and manufacturing of fuel cell systems, translating into more jobs and a robust economy for our citizens," said Johnson.

(Source: Ohio Department of Development news release, 9/1/04)

(7) WISCONSIN - Model Community-Based Wind Investment Plan Available

The Wisconsin Community-Based Windpower Business Plan project has developed a business model that allows for smaller investors to participate in the ownership and financial returns from wind power projects. A five-page report detailing the business model notes that community-based projects -- which might involve individual or small clusters of utility-scale turbines -- have the potential to promote wind energy, to democratize ownership in the wind industry and to enhance rural economic development. The report describes how a "hybrid business model" could benefit small investors and larger investors or corporations.

NATIONAL NEWS

(8) FERC Invites Supplemental Comments on Small-Generator Interconnection Agreements

The Federal Energy Regulatory Commission (FERC) has invited supplemental public comments on the Commission's development of standardized interconnection agreements and procedures for small generators. Since FERC issued a Notice of Proposed Rulemaking in this docket (Docket No. RM02-12-000) on July 24, 2003, the small-generator industry has continued to evolve, and several states have adopted new guidelines for small-generator interconnections.

FERC's notice of request for supplemental comments, issued August 12, 2004, allows interested parties to share meaningful progress made by groups of stakeholders in resolving issues such as the appropriate technical standards for screens, the necessity for certain interconnection studies and other modifications to proposed provisions. FERC will consider any new consensus proposals in the formulation of the Final Rule.

Comments should reference Docket No. RM02-12-000 and must be filed on or before October 1, 2004. Comments must be double spaced and should include an executive summary. Filings may be made

electronically at FERC's web site; alternatively, stakeholders must mail an original and 14 copies of comments to:

Federal Energy Regulatory Commission
Office of the Secretary
888 First St., N.E.
Washington, DC 20426

(9) FERC to Hold Technical Conference on Wind Interconnection

The Federal Energy Regulatory Commission (FERC) will host a technical conference on September 24, 2004 to discuss issues raised by a petition for rulemaking submitted by the American Wind Energy Association (AWEA) related to the adoption of certain requirements for the interconnection of large wind generators. AWEA's request for technical consideration was included in a filing made on May 20, 2004 (Docket No. RM02-1-005).

The goal of the technical conference is to discuss the technical requirements for the interconnection of large and small wind generators and other alternative technologies, and the need for creating specific requirements for their interconnection to the grid. These issues include the use of non-synchronous generator and other alternative technologies that respond differently to grid disturbances and may have different effects on the grid than large, synchronous generators. Topics to be discussed at this conference may include: a discussion of the AWEA proposal; the impact of the proposal on issues of reliability; the specific requirements of small wind generators; and the technical and operational needs of other alternative technologies.

The conference is open for the public to attend, and registration is not required; however, in-person attendees are asked to register for the conference on-line by September 22, 2004. Parties interested in speaking at the conference should file a request to speak by September 10, 2004. The conference will be held at the FERC's headquarters in Washington, DC. The event is scheduled to begin at 10:30 a.m. and will end at approximately 4:30 p.m. (EST) in the Commission Meeting Room (Room 2-C). For more information about the conference, contact Bruce Poole at (202) 502-8468 or bruce.poole@ferc.gov.

(Source: FERC notice, 8/27/04)

(10) Critical-Power Industry Forms New Coalition, Issues White Paper

Representatives of the critical-power industry announced in August 2004 the formation of the Critical Power Coalition (CPC), a national organization whose mission is to develop common public policy and establish a unified industry voice to ensure the quality, reliability and continuity of electrical power within critical industries, businesses and public services.

The CPC, comprised of representatives from leading vendors and end-users of critical-power products and services, brings together industry leaders to focus on urgent policy, technology and regulatory issues. The CPC's founding members include representatives from American Power Conversion, Caterpillar, Cummins, Digital Power Group, Eaton Corporation and its Powerware Division, Emcor, EnerSys, EYP Mission Critical Facilities, Liebert/Emerson, MGE UPS Systems, Siemens, SquareD and Tishman Technologies.

"Nearly every significant facet of the nation's banking, communications, safety and vital infrastructures relies on electric power to operate," said Mark A. Ascolese, CPC co-chairman. "Meanwhile, increasing power demand is compromising the power grid's ability to supply clean, uninterrupted power. While government and public utility companies continue to work on strengthening and improving the grid, companies and government organizations are tasked with designing and managing critical power in their

own operations -- inside their facilities -- and will ultimately need to develop systems and plans to sustain critical operations when the utility grid is unable to provide clean, uninterrupted power."

Formal announcement of the CPC falls one year after the August 14, 2003, blackout that plagued a wide swath of North America and follows the recent release of the 9/11 Commission Report that details the investigation of private sector preparedness following 9/11 attacks. With respect to electric power, the CPC has noted that it agrees with the 9/11 Commission in that the private sector and the majority of the public sector are not prepared and that secure electric power is a vital component of overall security preparedness.

"Power security must be based on the reality that the public grid will not be available when it is most needed -– in time of crisis, whether from natural disasters or acts of terrorism," said Mark P. Mills, CPC co-chairman. "In the post 9/11 world, both the private and public sectors should plan and equip for events that can impact the availability of electric power for critical services and operations."

The Critical Power Coalition's preliminary initiatives include:

- building a new and unique presence in Washington D.C. to support activities now underway in regulatory, financial and legislative arenas;
- raising awareness for the importance of critical power at the point-of-use, on the customer side of the meter, from traditional markets (data and telecom) to non-traditional markets (water and E-911);
- promoting best-practice sharing in critical power management; and
- differentiating the needs of the critical power industry from those of the grid power industry.

A CPC white paper, titled *Critical Power*, discusses the protection of electric-power infrastructures and addresses key vulnerabilities and considerations for securing critical power. The paper focuses on grid outage risks, power demands of a digital economy, the establishment of standards, resilient power, and information on public and private sectors taking a distributed approach to securing their own particularized critical power requirements.

(Source: CPC news release, 8/2/04)

(11) Study Identifies Vulnerabilities of U.S. Power Grid

Vulnerabilities inadvertently built into the U.S. power grid have been identified by a team of researchers from multiple organizations, including Pennsylvania State University (PSU) and the National Renewable Energy Laboratory (NREL). The team's topological analysis of the grid structure revealed that, although the system has been designed to withstand the random loss of generators or substations, its integrity may depend on protecting a few key elements.

"Our analysis indicates that major disruption can result from loss of as few as 2% of the grid's substations," said Reka Albert, assistant professor of physics at PSU.

One implication of the research is that identification of strategic points in the grid system can enhance defense against interruptions, whether by equipment failure, natural disasters, or human activity. Major blackouts caused by failures in the grid, such as the one that affected the northeastern part of the country during the summer of 2003, incur tremendous economic, public-health, and security risks.

The study, titled *Structural Vulnerability of the North American Power Grid*, was published in a recent issue of the journal *Physical Review E*. The researchers constructed a model of the entire transmission grid with over 14,000 "nodes," including generators, transmission substations, and distribution substations, and over 19,000 "edges," corresponding to the high-voltage transmission lines that carry power between the nodes. They measured the importance of each substation node based on its "load," or the number of shortest paths between other nodes that pass through it. While 40% of the nodes had a

load below 1,000, the analysis identified 1% of the nodes -- approximately 140 -- that have a load higher than 1,000,000.

This high degree of connectiveness in the grid system allows power to be transmitted over long distances, but it also allows local disturbances to propagate across the grid.

"There are systems to protect the nodes from overload, such as a controlled shutdown to take a substation out if it overloads or to shut off a generator. In general, these systems do a good job of protecting the nodes," says Reka Albert. "What this model really looks at is the effect of losing a number of nodes in a short period."

If the nodes are removed randomly, the effect on the system is roughly proportional to the number of generators or substations removed. However, the grid quickly becomes disconnected when the high-load transmission substations are selectively removed from the system -- if the nodes that have the highest load are removed first, followed progressively by the nodes with successively lower loads. According to the model, a loss of only 4% of the 10,287 transmission substations results in a 60% loss of connectivity. During a cascading failure, in which the high-load substations fail in sequence, the model shows that the loss of only 2% of the nodes causes a catastrophic failure of the entire system.

The authors point out that this vulnerability is an inherent part of the existing system. If the power grid were highly redundant, however, the loss of a small number of nodes should not cause power loss because the system reroutes through alternative paths. Possible remediation schemes include increased redundancy focused on key substations and transmission lines, or more distributed generation, which would decrease the load on these key points.

"Future additions to the system should consider the effect of the new nodes on relieving strain on key nodes," Albert says. "From this model, we know how defects can propagate through the system, we have identified parts of the system that need to be improved because they are not redundant, and we can show which substations need to be protected from failure in order to avoid widespread system failure. These are considerations that could help guide energy policy decisions."

(Source: Penn State University news release, 9/2/04)

(12) NERC Report Highlights Electric-Reliability Status on Blackout Anniversary

One year after a massive blackout darkened much of the Northeastern United States and Eastern Canada, the North American Electric Reliability Council (NERC) has prepared a status report highlighting the major actions that NERC and the industry have taken to improve the reliability of the North American bulk electric system. The 18-page report, titled *The August 14, 2003 Blackout One Year Later: Actions Taken in the United States and Canada to Reduce Blackout Risk*, is available at NERC's web site.

"As we near the anniversary of the August 14 blackout, the good news is that NERC and the electric industry have taken significant and meaningful steps to improve the reliability of the bulk electric system and reduce the risk of another major blackout," stated Michehl R. Gent, NERC president and CEO. "The bad news is that we are still waiting for the passage of legislation by the United States Congress that would make compliance with NERC reliability standards mandatory and enforceable," said Gent. "Until that occurs, we will work with the government and the industry to do everything we can to ensure that all entities whose operations affect the operation of the bulk electric grid comply with NERC standards, but that is not a substitute for legislation."

Earlier this year, NERC and the U.S.-Canada Power System Outage Task Force both issued thorough technical reports that examined the causes of the blackout. These reports contained recommendations on a range of actions that must be taken to reduce the risk of a similar outage occurring in the future.

The most significant actions NERC has taken to date include correcting the direct causes of the blackout, conducting extensive audits of all major system operators to ensure that they are prepared to operate the system reliably, and substantially revising existing reliability standards and developing new ones to ensure that the reliability "rules of the road" are understood and followed by all entities whose operations affect the reliability of the bulk electric system. Although many important initiatives have been completed or are well under way, some will take years to implement. NERC is working closely with the government task force to ensure that all recommendations resulting from these investigations are tracked and implemented.

(Source: NERC news release, 8/11/04)

(13) DOE Conducts Workshop on RD3 Plan

The U.S. Department of Energy (DOE) held a workshop in August 2004 on the Electric Distribution Transformation Program's Multi-Year Research, Development, Demonstration and Deployment (RD3) Plan. The workshop included active information-sharing sessions and served to synthesize input from leading experts and stakeholders on key RD3 activities for 2005-2009 to support the Grid 2030 Vision, specifically with respect to modernizing distribution grid operations.

The workshop was designed to identify technical challenges and targets, along with key RD3 activities for 2005-2009 to be undertaken by DOE/private sector partnerships that (1) focus on distributed sensors, intelligence, smart controls, communications, interconnection, and advanced simulation and modeling -- critical technology areas described in the January 2004 *National Electric Delivery Technologies Roadmap* -- and (2) respond to the recommendations in the *Final Report on the August 14, 2003 Blackout in the United States and Canada* relating to electric distribution operations.

For more information regarding this workshop or the RD3 Plan, see the Electric Distribution Transformation Program's web site.

(14) EPA Issues Guidelines on SIP Credits for Local EE, RE Projects

The U.S. Environmental Protection Agency (EPA) has issued a publication that provides guidance to states and local areas on quantifying and including emission reductions from energy efficiency and renewable energy measures in State Implementation Plans (SIPs). The 38-page publication, titled *Guidance on State Implementation Plan (SIP) Credits for Emissions Reductions from Electric-Sector Energy Efficiency and Renewable Energy Measures*, includes step-by-step instructions for quantifying SIP credits. These steps include: (1) estimating the energy savings or amount of energy generation that will be displaced by the new generator, (2) converting the energy impact of a project or initiative into an estimate emissions reduction, (3) determining the impact from the estimated emission reduction on air quality in the non-attainment area and (4) providing a mechanism to validate or evaluate the effectiveness of the project or measure.

This publication was developed jointly by the EPA's Office of Air Quality and Standards, and the EPA's Office of Atmospheric Programs.

INTERNATIONAL NEWS

(15) EUROPEAN UNION - GHG Emissions Drop in EU15

Data issued in July 2004 by the European Commission and the European Environment Agency show that after an increase in earlier years, emissions of the six greenhouse gases (GHGs) addressed by the Kyoto Protocol dropped by 0.5% in 2002. The main reason for the decrease is a shift from coal to gas and reduced emissions from manufacturing industries and households. The reduction takes the EU a step closer to its target of an 8% cut within the next eight years. New initiatives to reduce emissions, such as the Emission Trading Scheme, have been implemented since 2002 and should expedite the reduction of GHGs in the near future.

“Member states that started early with determined climate policies are moving in the right direction again," said European Environment Commissioner Margot Wallström. "However, this positive news only holds true for a few member states. The majority of member states urgently need to take additional measures and to continue to implement measures to tackle climate change.”

The emissions from the GHGs increased in the EU15 by 0.2 and 1.3% in 2000 and 2001, respectively. Emissions in 2002 were thus almost 3% lower than the base year of the Kyoto Protocol of 1990.

However, the EU15 still has a long way to go to meet its commitment under the Kyoto Protocol. The EU aims to reduce GHG emissions by 8% from 1990 levels by 2008-2012. Assuming the 8% reduction between the base year and 2008-2012 were to follow a linear path, emissions should have fallen by 4.8% by 2002. Instead, the EU15 is 1.9% above the Kyoto track. Only four countries -- France, Germany, Sweden and the United Kingdom -- are on track, without use of the Kyoto Protocol’s trading mechanisms, which allow reductions to be made in other countries to comply with the national targets.

The other EU15 member states may miss their emission targets, some by a substantial margin. This is the case particularly for Spain, Portugal, Ireland, Austria, Italy, Denmark and Greece. Some of these Member States already have concrete plans to fulfill at least parts of their commitments with market-based flexible mechanisms conceived under the Kyoto protocol.

Since 2002, however, several EU and national initiatives to reduce greenhouse gas emissions have been approved. This should lead to an acceleration of progress towards the Kyoto target. One important initiative is the EU Emissions Trading Scheme starting next January that will allow energy-intensive industry to reduce its CO2 emissions in the most cost-effective way.

Seven Member States reduced their emissions in 2002. While the emissions from the United Kingdom dropped by more than 3%, the emissions from Italy, The Netherlands, Germany, Denmark, France and Ireland, were reduced by 0.1-1.6%. Germany, the largest emitter in the EU, has achieved the biggest reductions in greenhouse gas emissions since 1990, down by 19%.

The assessment covers the EU15 only because the 10 new member states were not yet legally obliged to submit data under the monitoring mechanism. The EU enlargement will not affect the EU15 Kyoto commitment.

(Source: EU news release, 7/15/04)

INDUSTRY NEWS

---

(16) AEP Addresses Company's Ability to Meet Proposed Federal Emissions Regulations

American Electric Power (AEP), one of the largest investor-owned utilities in the United States, has released the report of an independent subcommittee of AEP’s board of directors stating that the company

is "well-positioned to effectively manage future proposed emission constraints." A three-member, ad hoc subcommittee completed the assessment and report as part of a previously announced agreement with the Connecticut Retirement Plans and Trust Funds and other shareholders in response to a shareholder proposal filed for consideration at AEP's 2004 Annual Meeting.

The report, titled *An Assessment of AEP's Actions to Mitigate the Economic Impacts of Emissions Policies,* evaluates the impact of proposed federal legislation and regulations for reducing regulated emissions and carbon dioxide, including the Clean Air Interstate Rule, the Utility Mercury Reduction Rule, U.S. Sen. Thomas Carper's proposed Clean Air Planning Act of 2003, and U.S. Senators John McCain and Joseph Lieberman's amended Climate Stewardship Act of 2003. The report also reviews the actions available to control those emissions and provides economic analyses of the various control scenarios.

"Based on our evaluation, during which we met with nearly 30 individuals with diverse views and expertise on the issues of air emissions, we concluded that the actions AEP has taken and is taking to address its emissions, in anticipation of possible control requirements, constitute a solid foundation and put the company in a position to effectively manage the potential economic impact," said Robert Fri, an AEP board member.

The report indicates that proposed legislation to cut greenhouse gases would not likely strand AEP's near-term planned investments of $3.5 billion in emission control technologies by 2010 (part of an overall $5 billion planned investment by 2020). Such proposed legislation could materially alter the amount and manner of the anticipated $1.5 billion in additional investments after 2010.

As part of its future plans to mitigate the economic impacts of its emissions, AEP has committed to accelerating IGCC deployment by building one, or more, commercial-scale, base-load integrated gasification combined cycle (IGCC) plants (up to 1,000 megawatts) as soon as 2010. The Electric Power Research Institute (EPRI) estimates for engineering and constructing a large-scale IGCC plant are as low as $1,300 per installed kilowatt. A construction timetable or location for the facility has not been determined.

American Electric Power owns more than 36,000 megawatts of generating capacity in the United States and is the nation's largest electricity generator. AEP is also one of the largest electric utilities in the United States, with more than 5 million customers linked to AEP's 11-state electricity transmission and distribution grid. The company is based in Columbus, Ohio.

(Source: AEP news release, 8/31/04)

(17) Sustainable Energy, Future Electronics to Collaborate on Distribution

Sustainable Energy Technologies, a global developer of advanced power electronics for the alternative energy industries, has entered into a Bonded Inventory Management program with Future Electronics to guarantee the supply of critical power electronics components on a timely and cost-effective basis for the production of Sustainable Energy Technologies' fuel cell and solar inverters.

Future Electronics, a company that distributes and markets semiconductors and passive, interconnect and electro-mechanical components, operates in 35 countries.

"This contract is the cornerstone of our component supply chain, securing our manufactured cost structure, and providing just-in-time control over the most important components of our SUNERGY 5 solar-power inverter," said Derek Howell, director of operations for Sustainable Energy.

With the exception of the unique cast aluminum enclosure, virtually all of the components used in manufacturing Sustainable Energy's power inverters are off-the-shelf, according to the company. This enables Sustainable Energy to outsource manufacturing to contract manufacturers anywhere in the world more easily, with component delivery handled by Future Electronics. Inverters initially will be

manufactured in Calgary, Canada, although contract manufacturers can be sourced locally in target markets, a strategy that has been effectively implemented by the telecommunications industry, according to Sustainable Energy.

“The SUNERGY 5 inverter is now in the final stages of Underwriter Laboratories certification – a normal precondition to commercial sales in North America," added Howell. "The core power electronics have already met the European CE (European Conformity) standards as an integral component of a combined heat and power fuel cell system, which received CE certification earlier this year. With this in mind we are highly confident that the SUNERGY 5 inverter will receive UL certification by the end of this quarter."

By eliminating complex circuitry, Sustainable Energy’s power inverter platform offers a lower component count, greater reliability and the industry’s highest electrical conversion efficiencies through a full load, according to the company. The SUNERGY 5 comes with a standard 10-year warranty.

(Source: Sustainable Energy Technologies news release, 8/5/04)

(18) Xantrex Introduces Balance-of-System Components, System Packages

Xantrex, a Canadian manufacturer of advanced-power electronic products, has introduced balance-of-system (BOS) components and system packages for its SW Plus Inverter/Charger that the company says will simplify on-site assembly and installation of renewable-energy conversion and management systems.

Renewable energy dealer, installers and distributors now can order the specific components needed for a complete renewable-power installation. Traditionally, Xantrex has sold complete renewable-power systems as a custom power panel that comes pre-assembled from the factory. Weighing about 500 pounds, the power panels are more difficult to ship and require more than one person and special equipment for installation.

“SW Plus BOS components and system packages offer renewable-energy distributors and dealers and installers the flexibility they’ve been asking for,” said Smitty Ovitt, director of sales for Xantrex. “Many installers work alone and have told Xantrex that on-site assembly of individual components is easier and more convenient than mounting a pre-assembled unit such as the original SW Power Panel.”

In addition to selling each of the system components separately, Xantrex offers 10 basic system packages designed to ensure maximum energy production in a wide range of off-grid applications. These packages are available in single- or dual-inverter/charger configurations and include various combinations of SW Plus Inverter/Chargers, conduit boxes, charge controllers, mounting plates and other components. SW Plus system packages are designed for easy on-site assembly and connection to a renewable-energy source such as solar panels, wind generator or micro-hydro system.

For more information on SW Plus BOS components and system packages, see www.xantrex.com/bos.

(Source: Xantrex news release, 8/24/04)

(19) Solectria Introduces 13.2-kW Inverter

Solectria Corporation has introduced a 13.2-kilowatt inverter for grid-connected commercial three-phase PV systems for the North American market. The inverter is certified to UL1741, according to the company.

“The PVI13KW has a fully integrated design, and sets a new industry standard for efficiency, ease of installation and reliability,” said James Worden, CEO of Solectria. “This new design is based on Solectria’s 14-year legacy of designing and producing high reliable power electronic components used in severe environments such as automotive, truck, bus, military and off-road applications.”

The PVI13KW includes both a DC disconnect and a fused AC disconnect, an AC contactor for zero Watt standby loss, an optional built-in seven-fuse PV combiner, a premium efficiency transformer and filter, and a state-of-the-art DSP-controlled, trench-gate IGBT inverter core. The unit is fully assembled and tested at Solectria, an ISO 9001:2000 certified manufacturer. Multiple inverters can be used in parallel for larger PV systems.

Based in Woburn, Massachusetts, Solectria develops and manufactures components for electric, hybrid, and fuel cell vehicles, and for the distributed generation of electric power.

(Source: Solectria news release, 8/10/04)

(20) SMA Offers New 6-kW "Sunny Boy" Inverter

SMA America has introduced the latest addition to the company's line of Sunny Boy Inverters, the Sunny Boy 6000. The Sunny Boy 6000U has a peak efficiency of 95.3% and can be incorporated into PV systems that previously required multiple Sunny Boy inverters. According to the company, the Sunny Boy 6000U makes it practical to install much larger systems while retaining many of the advantages of the modular inverter concept. The Sunny Boy 6000U is geared toward large residential systems and small to medium commercial systems.

Built for either indoor or outdoor use, the inverter features field-configurable outputs, making it possible to stock a single unit for use with 208, 240 or 277-Vac systems. The wide DC input voltage range also permits connection to almost any type of PV modules, according to the company. The 6000U includes an onboard LCD display as well as a separate serial interface to allow remote monitoring using the same communication accessories as all inverters in the Sunny Boy family.

SMA America, based in Grass Valley, California, is the North American division of SMA Regelsysteme GmbH (SMA). SMA America was established in 2000.

(Source: SMA America news release, 9/2/04)

PUBLICATIONS AND ANNOUNCEMENTS

(21) New Report Details Scope and Types of DG Installations in U.S.

The *DG Monitor* has issued a new publication that estimates the installed distributed generation (DG) base in the United States as of January 1, 2004. The report, *The Installed Base of U.S. Distributed Generation: 2004 Edition,* indicates that there are 12.3 million DG units in place in the United States, with a combined capacity of 234 GW. The report includes information on the total number of DG units, capacities, generation and thermal outputs broken down by technology, application, primary fuel and year of installation. To order the report, see www.distributed-generation.com.

(22) NREL Invites Feedback on REPiS Web Site

The National Renewable Energy Laboratory (NREL) has invited feedback on the Renewable Electric Plant Information System (REPiS) web site in an effort to make the site more user-friendly. REPiS is a database of grid-connected electricity-generating facilities that utilize renewable energy technologies such as biomass, geothermal, hydroelectric, solar and wind.

NREL's Energy Analysis Office (EAO) currently is updating REPiS, with the new edition scheduled for release in fall of 2004. NREL has created an on-line survey for users to submit comments or suggestions for improving REPiS.

(23) Energy Info Source Unveils New Edition of GHG Emissions Trading Report

Energy Info Source has published the 2nd edition of its *Greenhouse Gas (GHG) Emissions Credit Trading Report*, a 125-page study of the current state of the global move towards developing markets for trading GHG emissions credits.

The report contains the following:

- An overview of the climate change debate
- Details on the major greenhouse gases
- An explanation of the Kyoto Protocol and the Marrakesh Accords
- A discussion of the basics of GHG emissions trading
- A comparison of different trading schemes and methods
- A review of U.S. and International actions to implement GHG emissions trading
- An analysis of the current market for emissions credits
- A forecast of future emissions credit market volume and prices
- Profiles of the major traders, brokers, exchanges, and registries involved in GHG emissions trading

The report is available in electronic format or as a hard copy for $399. To order the report or to obtain more information regarding the report, click here or call at 1-888-986-2250 from the United States (1-303-986-7449 from outside the United States).

(24) EIA Report Details U.S. Renewable-Energy Consumption

Renewable energy consumption in the United States increased by 3% in 2003, according to a report issued by the Energy Information Administration (EIA) in July 2004. The report, titled *Renewable Energy Trends 2003*, found that more than half of this increase resulted from a 4% gain in conventional hydropower, while a 3% increase in biomass accounted for most of the remaining growth. Wind, geothermal and solar energy consumption changed only modestly, according to the report. The data from this study eventually will be incorporated into the EIA's *Renewable Energy Annual 2003*, scheduled to be published in November.

(25) DOE Publishes Revised Brochure on Rural Wind Development

The U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy has revised a publication that provides rural stakeholders with information regarding wind-energy projects and rural economic development. The eight-page brochure, *Wind Energy for Rural Economic Development*, includes case studies and resources for those interested in bringing wind energy to their communities.

PEOPLE

(26) SEIA Chooses New Board President, Executive Director

The Solar Energy Industries Association (SEIA) has appointed a new board president and a new executive director. Chris O'Brien, Washington representative for Sharp Solar USA, recently assumed the role of president of SEIA's board of directors. O'Brien replaced Chet Farris, CEO of Shell Solar, who resigned from Shell. Gordon Handelsman will now represent Shell Solar on the SEIA board of directors. Scott Sklar, SEIA's interim executive director, lauded Farris' tenure and praised O'Brien, stating that O'Brien would bring "sound judgment and strong leadership to the U.S. solar industry."

Rhone Resch, senior vice president of the Natural Gas Supply Association, will become executive director of SEIA on September 1, 2004. "Rhone's background at EPA and his senior position with the Natural Gas Supply Association typifies the kind of person the solar industry needs -- substantive environmental and industry background coupled with solid energy experience," O'Brien said.

SEIA is the national trade organization representing solar-electric and solar-thermal manufacturers, component suppliers and distributors.

(Source: SEIA news release, 8/12/04)

(27) Former AstroPower Executive Joins Evergreen Solar

Evergreen Solar, a developer of proprietary, solar power products, recently announced that Terry Bailey has joined the company as senior vice president of marketing and sales. Bailey will be responsible for Evergreen Solar's sales, marketing, strategic planning, and business development activities.

"Terry is a world-class marketing executive with critical industry experience, relationships and an innovative vision," said Richard Feldt, president and CEO of Evergreen Solar. "His proven track record at larger technology companies, such as Apple, NEC, and most recently AstroPower, uniquely qualifies him to join our management team. Terry's focus on driving corporate partnering opportunities and Evergreen's overall marketing and sales efforts will be central to our success."

Bailey has 20 years of experience in strategic business planning, sales, marketing, product development and corporate operations. Bailey most recently served as vice president of marketing and sales for AstroPower, which was recently acquired by General Electric. He was responsible for global sales and marketing at AstroPower, which had revenues of $70 million and worldwide sales offices.

Bailey earned a Ph.D. in analytical chemistry from Florida State University, specializing in nuclear magnetic resonance research and computer system graphics integration.

(Source: Evergreen Solar news release, 8/12/04)

EVENTS

Public Fuel Cell Alliance National Membership Meeting
Presented by Public Fuel Cell Alliance (PFCA)
September 15, 2004
Washington, DC
http://www.cleanenergystates.org/JointProjects/fuelcells.html

H2 Expo: International Trade Fair for Hydrogen and Fuel Cell Technologies
Sponsored by German Hydrogen Association; National Hydrogen Association (NHA)

September 15-17, 2004
Hamburg, Germany
http://www.h2expo.de

EMA's 8th Annual Fall Meeting & International Conference
Presented by Emissions Marketing Association (EMA)
September 19-22, 2004
Toronto, Canada
http://www.pmaconference.com/emissionsmarketingSept19.04.pdf

Renewable Energy in Latin America
Presented by Platts
September 20-21, 2004
Miami, FL
http://www.pmaconference.com/LatinAmerica2ndSept20.04.pdf

5th Annual CHP Roadmap Workshop
Presented by U.S. DOE, U.S. EPA, USCHPA
September 20-21, 2004
Austin, TX
http://www.energetics.com/5thchpworkshop

European Wind Energy Conference & Exhibition
Presented by European Wind Energy Association (EWEA)
September 22-26, 2004
London, United Kingdom
http://www.ewea.org

Renewable Energy Roundup & Green Living Fair
Organized by Texas Solar Energy Society; Texas Renewable Energy Industries Association
September 24-26, 2004
Fredericksburg, TX
http://www.theroundup.org

Hydrogen and Fuel Cells 2004 Conference and Trade Show
Sponsored by Canadian Hydrogen Association; Fuel Cells Canada; Government of Canada
September 25-28, 2004
Toronto, Canada
http://www.hydrogenfuelcells2004.com

DG For Power Reliability and Security
Presented by EUCI, Resource Dynamics Corporation
September 27-28, 2004
Atlanta, GA
http://www.euci.com

NASEO 2004 Annual Meeting
Presented by NASEO
September 28-30, 2004
Chicago, IL
http://www.naseo.org

9th National Green Power Marketing Conference
Presented by U.S. Department of Energy
October 4-6, 2004
Albany, NY

http://www.eere.energy.gov/greenpower/conference

Advanced Energy & Fuel Cell Technologies
Presented by Society of Manufacturing Engineers (SME)
October 11-13, 2004
Livonia, MI
http://www.sme.org/cgi-bin/get-event.pl?--001540-000007-018921--SME-

EUROPV
Presented by European Union (EU)
October 15-20, 2004
Kranjska gora, Slovenia
http://www.pv-net.net/europv2004.htm

Solar Power 2004
Presented by SEPA; SEIA
October 18-21, 2004
San Francisco, CA
http://www.SolarPower2004.com

Energy & Electronic Materials 2004
Presented by *Energy & Electronic Materials* magazine
October 20-21, 2004
Denver, CO
http://www.infowebcom.com/materials_conf_registration.htm

International Business Exchange Forum - Renewable Energy
Presented by German Office for Foreign Trade
October 21-22, 2004
Augsburg, Germany
http://www.renewable-forum.com

5th International Conference on Cogeneration and Decentralized Energy
Presented by World Alliance for Decentralized Energy (WADE)
October 27-28, 2004
Beijing, China
http://www.localpower.org

World Wind Energy Conference 2004 / Wind Power Asia 2004
Presented by World Wind Energy Association (WWEA), Chinese Wind Energy Association (CWEA)
Beijing, China
Nov. 1-3, 2004
http://www.wwec2004.cn/meshwork/main/main.htm

2004 Fuel Cell Seminar
November 1-5, 2004
San Antonio, TX
http://www.fuelcellseminar.com

NARUC 116th Annual Convention
Presented by National Association of Regulatory Utility Commissioners (NARUC)
November 14-17, 2004
Nashville, TN
http://www.annual.narucmeetings.org

International Solar Cities Congress 2004
Presented by United Nations Environment Programme (UNEP), et al.
November 14-18, 2004
Taegu, South Korea
http://www.solarcity2004.or.kr/index.asp

Integration of Renewable Energy Sources and Distributed Energy Resources
Presented by European Commission
December 1-3, 2004
Brussels, Belgium
http://www.conference-on-integration.com

Landfill Gas Conference
Presented by NC Department of Environment and Natural Resources
December 3, 2004
Raleigh, NC
http://www.ncsc.ncsu.edu/calendar/events.cfm

H2PS: 2004 Hydrogen Production & Storage Conference
Presented by Intertech
December 6-8, 2004
Washington, DC
http://www.intertechusa.com

POWER-GEN Renewable Energy
Presented by Power Engineering; ACORE
March 1-3, 2005
Las Vegas, NV
http://www.power-gengreen.com

Power Systems Conference 2005: Distributed Generation, Advanced Metering and Communication
Presented by Clemson University Electrical Power Research Association (CUEPRA)
March 9-11, 2005
Clemson, SC
http://www.ces.clemson.edu/powsys2005

IDEA 18th Annual Campus Energy Conference
Presented by International District Energy Association (IDEA)
March 9-11, 2005
Washington, DC
http://www.districtenergy.org/calendar.htm

World Renewable Energy Congress
Presented by University of Aberdeen
May 22-27, 2005
Aberdeen, Scotland (UK)
http://www.WREC2005aberdeen.co.uk

International Hydrogen Energy Congress & Exhibition
Presented by International Center for Hydrogen Energy Technologies (UNIDO-ICHET)
July 13-15, 2005
Istanbul, Turkey
http://www.ihec2005.org