Volume IV, Issue 3, June/July 2004

DG MONITOR[SM]

DG Uniquely Positioned for Power Reliability and Security

For several years, the deployment of distributed generation (DG) has been discussed principally as an economic issue, with the primary focus on the ability of customers to generate power on-site in lieu of purchasing power for the local utility. The events of 9/11 (September 11, 2001) and the Northeast blackout of August 14, 2003 have altered the picture for DG, presenting a window of opportunity for DG to assume a new and higher profile role in ensuring the reliability and security of power supply to both critical facilities and to the grid as a whole.

The 9/11 terrorist attacks upon the United States placed the vulnerability and exposure of our critical infrastructure in stark contrast. Previous to 9/11, concerns about risks of power interruption focused primarily on equipment failures, weather- and animal-related impacts, and vehicular impacts (e.g., cars hitting utility poles). Post 9/11, concerns are heightened with the scenario of deliberate, hostility-inspired attacks on the electric power system. This has sharpened the focus on the long-term security of our power supply.

Against this backdrop, a near-term, stopgap fix to the system must be found. As the dollar value of reliability is just beginning to be appreciated and the need for security is just coming to center stage, there is a distinct need to find an immediate backstop for a system becoming prone to instability. DG is uniquely positioned to provide power reliability by supporting transmission and distribution systems at weak or constrained points.
(continued on page 5)

The Most Effective Approach to Regulatory Approval of DG Interconnection Standards

Many DG customers, vendors and developers have long cited interconnection barriers as a major obstacle to DG technology commercialization. However, manufacturer, customer and utility DG activities are frequently not coordinated. In response to this problem, IEEE 1547-2003, Standard for Interconnecting Distributed Resources with Electric Power Systems, was published in July 2003. The purpose of IEEE 1547 was to provide consensus standard technical requirements for DG interconnection to the electric power system and for the performance, operation, testing, safety considerations, and maintenance of the interconnection.

Development of this standard was a difficult process. IEEE was able to address this complicated issue by fostering a standards development approach that is open to all interested parties. Through many meetings, drafts and votes, IEEE 1547 was arrived at as an industry consensus. Once adopted by regulators at the state level, this standard can help lower barriers to DG interconnection, provide uniformity to interconnection requirements and in the manufacture of interconnection hardware and technology, and aid in the commercialization of DG technologies.

As the market is discovering, development and promulgation of IEEE 1547 was only part of the challenge. Adoption of this standard at the state level is the next obstacle to be overcome. It is becoming apparent that adopting a standard is not as easy or straightforward as the standard developers originally believed. A number of options exist for this adoption process to take place. *(continued on page 5)*

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RESOURCE DYNAMICS CORPORATION

To view earlier editions of the DG Monitor or to begin receiving the publication via email please visit: www.distributed-generation.com.

About the DG Monitor. The DG Monitor is a bimonthly publication of the Resource Dynamics Corporation covering the many facets of the emerging Distributed Generation marketplace. Articles both report and interpret the most important items. In addition, the Monitor includes special series on DG technologies, applications, manufacturers, and other issues, providing the reader with a complete picture of these topics over several issues.

Comments or requests for additional information can be addressed to DGMonitor@rdcnet.com, through our website at www.distributed-generation.com, or by calling 703/356-1300.

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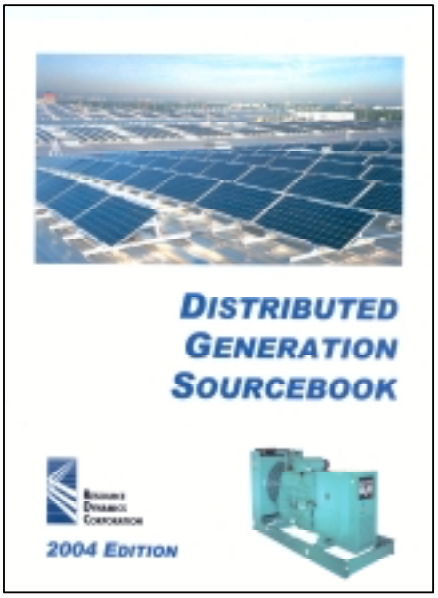
The **Resource Dynamics Corporation (RDC)** creates business solutions that empower clients to compete effectively in changing energy markets. Often, these involve evaluating the role of new technologies. All senior staff have both business and engineering backgrounds, with a distinct focus on strategy implementation. We combine these strengths to create innovative business solutions for energy technologies and markets. **RDC** utilizes an extensive set of tools including proprietary databases and models to develop these solutions.

We develop business solutions in four areas:

- **Distributed Generation**
- **Marketing for Energy Businesses**
- **Strategies for Power Suppliers**
- **Strategies for Energy Purchasers**

RDC has entered its 25th year. Meeting our clients' needs has always been our top priority and we have consistently delivered outstanding consulting services that enable our clients to reach their goals. Clients include energy companies, consumers, financial institutions, law firms, equipment vendors, trade associations, research organizations, government agencies and international institutions.

For more information, see www.rdcnet.com.



The rapidly developing Distributed Generation (DG) market is complex, with many players and stakeholders. The Resource Dynamics Corporation has developed the Distributed Generation Sourcebook: 2004 Edition to serve as both a learning tool and a handbook for those hoping to understand and benefit from DG. Updated for 2004, this edition features new sections, case studies and more. A brief outline of the comprehensive 198-page report is provided below.

- Introduction
- Chapter 1: Applications of Distributed Generation
- Chapter 2: Distributed Generation Technologies
- Chapter 3: The Distributed Generation Marketplace
- Chapter 4: Distributed Generation Interconnection
- Chapter 5: What Makes Distributed Generation Applications Successful
- Chapter 6: Barriers to Distributed Generation
- Chapter 7: The Installed Base of U.S. DG
- Chapter 8: U.S. Distributed Generation Market Assessment
- Appendix A: Glossary of Distributed Generation Terminology
- Appendix B: Directory of Manufacturers

To order this report or other DG publications, go to www.distributed-generation.com

Conference Announcement

DG for Power Reliability and Security Conference and Workshop
September 27-29, 2004
Atlanta, Georgia

For information: (303) 770-8800

TECHNOLOGY SERIES: NEW BIOMASS GASIFIER TECHNOLOGY HOLDS PROMISE FOR WASTE-FUELED DG – GUEST ARTICLE

When the term distributed generation is mentioned, the common assumption is the speaker is referring to fossil fuel based systems, such as gensets powered by natural gas fired combustion turbines and reciprocating engines. Typical sizes are from several hundred kilowatts to tens of megawatts. More recently microturbines of 30 to 100 kilowatts are included as elements of DG. There is another growing segment of DG, which is alternative energy systems, including solar, wind, biomass, and small-scale hydro.

Most of the biomass-to-energy systems have been large scale with outputs of 10, 20, or even 50 MW. Many of these plants have been designed to deliver their energy to the utility grid, and they are not oriented to producing small amounts of power for on-site use. This is changing with work being conducted around the country to build small systems from 25 kW to 10 MW. One of the more promising technologies is the gasification air turbine cycle, or GAT-Cycle™ plant.

Gasification is a known technology that has been around for decades and is now growing in use and development. Gasification can utilize a wide range of resources as fuel, including wood, crop residues, animal manures, sludges, and most any organic material. Coal gasification was a common process many years ago and produced gas that lit street lamps and was used before natural gas was widely available.

There are many different gasifier designs. Each has its pros and cons, and each has its limits in terms of what size is best. For small-scale systems, fixed bed gasification has proven a good choice. The gasifier operates by heating a solid fuel in an oxygen deficient atmosphere until it begins to break down and release volatile gases. The gas stream is commonly sent to a scrubber to clean it of particulates and contaminants. Then the gas goes to a firebox to be recombined with oxygen and burned to heat water and produce steam, or it is sent to a combustion turbine and fired to generate electricity.

The gasifier used in the GAT-Cycle™ plant is an underfed updraft design. Characteristics of its design are very low particulates in the syngas, very good CO and H_2 production and low NO_X generation. The syngas travels from the gasifier to an oxidizer where oxygen (in the form of mixing air) is introduced supporting an exothermic reaction generating a significant increase in temperature. This heat is used to produce deliverable energy. Key elements to controlling a gasifier are the air volumes allowed into the unit and where it is added, along with the rate of fuel feed and the quality of the fuel.

25,000,000 BTU/hr Gasifier

The GAT-Cycle™ turbine is similar to a combustion turbine except that it utilizes superheated air instead of combustible syngas from the oxidizer. The air turbine can be considered an externally fired engine, but it is not a Stirling engine. Without the combustion process inside of the turbine, wear on the turbine is reduced to normal rotational effects. The generating capacity of the GAT-Cycle™ turbine is 1.5 MW, or more with the addition of steam injection.

Traditional CHP systems produce electrical and thermal energy from combustion, but with the GAT-Cycle™ the combustion process is eliminated. The oxidizer output provides the heat needed for the air turbine, but only a portion of the heat is used, leaving a great deal of the heat for use in a heat recovery type boiler, or for dryers and other process applications.

A typical CHP system using a gasifier would direct the syngas into a combustion turbine. NO_X and CO can be a concern as the unit acts like a natural gas fired turbine. The air turbine by its nature eliminates this problem as the oxidizer controls the emissions.

Gasification-based DG is practical as it allows use of tremendous volumes of domestically available biomass, as well as abundant coal reserves. Gasification works equally well with either, or with combinations of the two. Typically the biomass fuels are available at no cost, as they are a waste, or for a low cost compared to natural gas or oil. Coal can be used in smaller-sized DG systems that are not possible with traditional technology, and gasification can allow the use of higher sulfur and higher ash coal.

The GAT-Cycle™ plant is a standard size made up of standardized modules. When configured together, these modules create an equipment train capable of producing a range of power and thermal capacities. Rather than having to design each plant from scratch, the proper number of equipment trains are used to meet the application load.

The remaining question is; "Is gasification based DG economical?" The answer can be yes. DG-sized gasification plants have a small footprint and low capital cost. They represent a lower financial risk for investors and can be relocated should the available fuel resource disappear.

Augers feeding biomass to the gasifier

Gasification-based DG systems can produce energy at a cost that can compete with traditional energy sources. Use of smaller systems allows the DG to be located closer to the fuel source, keeping transportation costs low. Smaller gasification systems, including the GAT-Cycle™, are now entering the marketplace. These technologies will find a place within the mix of DG technologies available.

This guest article was written by Bradley Schneider, President and CEO of Recovered Energy Resources, RER develops small-scale gasification based energy systems and is the developer of the GAT-Cycle™ plant. Their systems are sold to end-users. RER also builds, owns, and operates plants for customers that wish only to purchase energy. Additional information is available at www.recoveredenergyresources.com. Mr. Schneider is available for questions about gasification for DG applications and the GAT-Cycle™ plant by e-mail at bschneider@recoveredenergyreources.com or by phone at 248-421-5845. ■

Defining Iowa's Standards for DG Interconnection

The State of Iowa Department of Natural Resources engaged the Resource Dynamics Corporation to investigate questions and issues surrounding the interconnection of distributed generation (DG) within the state. Both the technical and business issues of interconnection were examined as part of a comprehensive assessment of procedures being used in Iowa.

As the project research progressed, it became readily apparent that the focus of DG development in Iowa is presently on renewable energy, primarily wind, biomass and solar. State policies and rules encourage renewable forms of energy supply. Iowa has been quite progressive in establishing and defining a class of non-utility generators called "alternate energy production (AEP)" facilities. The Iowa Administrative Code defines an AEP facility as an electric production facility which derives 75 percent or more of its energy input from solar energy, wind, waste management, resource recovery, refuse-derived fuel, agricultural crops or residues, or wood burning; or a hydroelectric facility at a dam.

Current rules in Iowa only cover DG interconnection for AEP facilities and Qualifying Facilities under the Public Utility Regulatory Policies Act (PURPA). The RDC report recommended that Iowa expand DG interconnection rules to encompass non-renewable DG. While not lessening the focus on renewable energy for Iowa, non-renewable projects may offer other benefits to the state (e.g., greater power system flexibility, increased reliability, etc.). Adopting interconnection rules that apply to these types of projects would open to door to the opportunity to realize some of these benefits.

RDC also recommended that IEEE Standard 1547 be adopted on a statewide basis. This would accomplish the following:

(continued on page 5)

(DG for Power Reliability, continued from page 1)
DG can also provide the power security and the "recovery" capability to applications supporting key community emergency management functions by systematic and strategic deployment in potentially impacted areas.

The window of opportunity for DG to fill this dual reliability and security role is open now. The ***Power Reliability and Security Council (PRASC)*** was launched to capitalize on this opportunity and support the use of DG as a measure for enhancing both power reliability and security. Formerly known as the Council for Distributed Grid Enhancement (CDGE), ***PRASC's*** overall mission is to advance and advocate the integration of an enhanced electric power grid with distributed generation to meet the power reliability and security needs of our critical infrastructure.

The next meeting of ***PRASC*** is scheduled for September 27, 2004 in Atlanta, Georgia. This meeting will be held in conjunction with the conference, "DG for Power Reliability and Security."

For more information on ***PRASC***, contact N. Richard Friedman of the Resource Dynamics Corporation at 703-356-1300, Ext 203, nrf@rdcnet.com, or Roger Feldman of Bingham McCutchen LLP at 202-778-3181, r.feldman@bingham.com. ■

(Iowa Standards, continued from page 4)

- Bring the state up to date by use of the most applicable and current standard for DG interconnection, developed by a wide range of utility and DG stakeholders on a national, voluntary, consensus basis;
- Offer a complete and comprehensive set of technical requirements for DG interconnection;
- Make interconnection requirements consistent across the state, subject to any local requirements that reflect differences in distribution system design, construction and operating practices, with any local requirements established in a transparent process; and,
- Offer a complete set of test requirements on a consistent basis.

The DG Monitor will keep its readers posted on the evolution of DG interconnection standards. For more information, or for a copy of the report "Defining Iowa's Standards for Interconnection of Distributed Generation" please contact the DG Monitor. ■

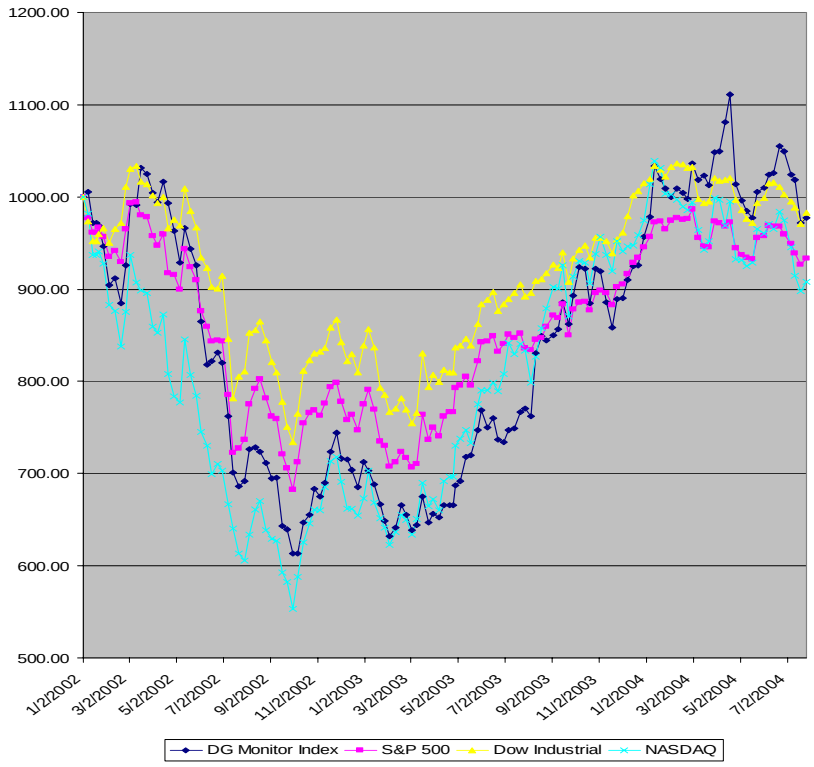
(Standards, continued from Page 1)
The adoption process seemingly favored by some advocates at the state level is "harmonization" of existing or draft state-level interconnection requirements with the IEEE 1547 standard (e.g., this approach is being used in the update of California's "Rule 21" standard). In this approach, a state standard or guideline is reviewed on a section-by-section basis against IEEE 1547. The requirements in the state document are then modified as deemed necessary to match or reflect the IEEE standard. The end result is a document that may or may not have requirements that are consistent with IEEE 1547, and the only way to determine the status of the state document within the context of the national IEEE standard is a line-by-line review of comparable requirements. This is not a preferred approach and tends to undermine the impact, intent and value of the national consensus standard.

The model for adopting a standard, and the most effective approach, has been used successfully for years in the case of the National Electrical Code (NEC - NFPA 70). Promulgated by the National Fire Protection Association, the NEC is issued periodically by the NEC code committee comprised of industry volunteer stakeholders, just as in the case of IEEE standards. The NEC is then adopted by appropriate authorities having jurisdiction at the county or state level across the country. As part of the adoption process, the adopting authority (typically the county or state) identifies requirements within the NEC that they want to supersede with local requirements. A compilation of these local requirements is issued as the supplemental local electrical code. The NEC is formally adopted at the local level, and then used in conjunction with the local requirements. The NEC provides the baseline for all requirements ensuring consistency across jurisdictional boundaries. The NEC creates a workable foundation for the design and manufacture of electrical equipment meeting the same standards in use across the country. This was exactly the intent in the development of IEEE 1547 regarding DG interconnection equipment.

This adoption process needs to be better understood by regulators and DG stakeholders alike. The DG Monitor will periodically review the standards adoption process at the state level, and report back to our readers on how it is working. In the meantime, all DG market participants should be cognizant of the pitfalls potentially associated with standards adoption, and the benefits flowing from universal adoption of IEEE 1547 with local requirements developed as needed. ■

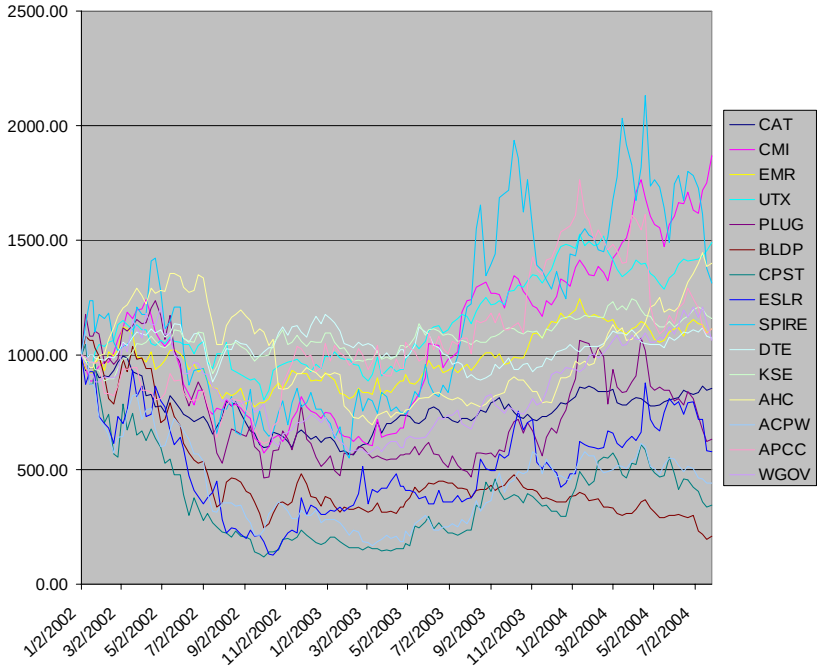
The DG Monitor Index℠

The DG Monitor Index℠ continues to outperform the returns of the S&P 500 and the NASDAQ from January 2002 through June 21, 2004, and just trails the Dow Industrials. The overall stock market has been weak over the last two months, but 6 companies in the DG Monitor Index℠ had positive returns. Amerada Hess (up 17% based on a strong oil and gas market), Cummins (up 17% based on strong engine sales), and United Technology (up 10%) lead the pack for the last two months.



Companies included in the DG Monitor Index℠ include:

- Active Power (ACPW)
- Amerada Hess (AHC)
- American Power Conversion (APCC)
- Ballard Power Systems (BLDP)
- Capstone Turbine (CPST)
- Caterpillar Incorporated (CAT)
- Cummins Incorporated (CMI)
- DTE Energy (DTE)
- Emerson Electric (EMR)
- Evergreen Solar (ESLR)
- KeySpan Corp (KSE)
- PlugPower Incorporated (PLUG)
- Spire Corporation (SPIRE)
- United Technologies (UTX)
- Woodward Governor Company (WGOV)



Over the past 2½ years, the strongest performer in the DG Monitor Index℠ has been Cummins Incorporated, with a gain of 87%. Cummins designs and manufactures diesel and natural gas reciprocating engines and also gensets using these engines. Although Cummins main focus is the truck engine market, Cummins also makes products for the distributed generation market, and also the marine, military, recreational vehicle, agriculture, and oil and gas markets. Cummins also is a leader in DG rentals. ■

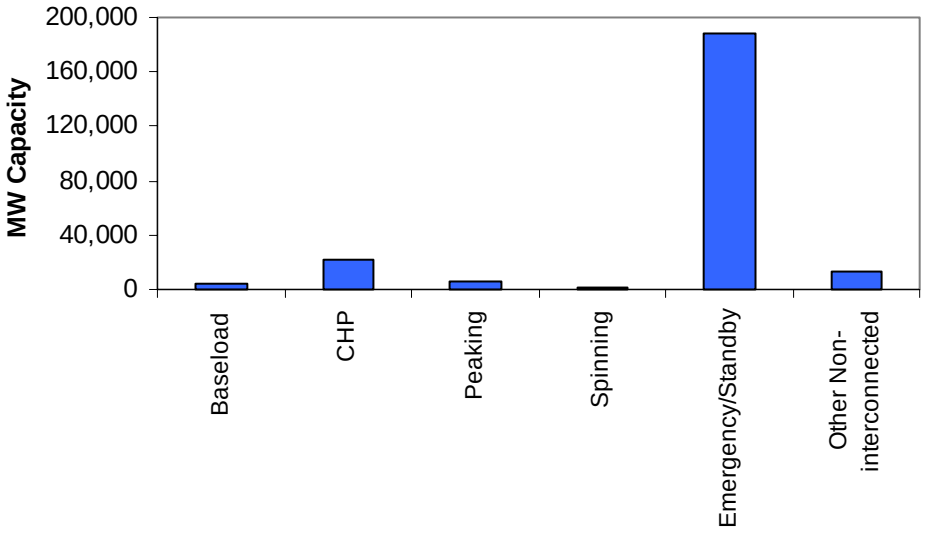
INSTALLED BASE OF U.S. DISTRIBUTED GENERATION

Many of DG Monitor readers purchased our original 2003 Installed Base study for a variety of purposes including understanding where the DG market is, how to service the installed base, and as a data source for projecting where the market might be headed.

The DG Monitor is now pleased to announce that the successor, ***The Installed Base of U.S. Distributed Generation: 2004 Edition,*** is available. This report, which estimates the installed DG base in the U.S. as of January 1, 2004, provides this key, and previously unavailable baseline information to help decision-makers at all levels make informed DG policy, regulatory and market decisions.

Top-line report results indicate there are 12.3 million DG units in place in the U.S. with an aggregate capacity of 234 GW. These units annually generate 188 TWh of electricity. In the report, the total number of DG units, capacities, generation and thermal outputs are broken out by technology, by application, by primary fuel, and by their year of installation. Figure 1 provides a top-level breakout of capacity by application, showing how much emergency/standby DG dominates the total market. However for many users, it is the breakout of non-emergency uses that is critical. The report also provides regional and industrial breakouts for the larger generators.

Figure 1. Installed U.S. DG Capacity at Start of 2004, by Application



The 2004 edition offers a number of improvements over the earlier version. We:

1. Recalculated all the numbers using an improved methodology. This is not just a simple update.
2. Brought the DG inventory from the end of 2000 to the end of 2003, including a recently much-improved Energy Information Administration data source. The results are both timelier and more accurate.
3. Applied an improved definition for DG units, adding units that sell a significant portion of their generation to electric utilities – but are still DG because the operator self-reports their generator as DG, are owned/operated by a non-investor owned utility, and often use the generator's thermal output locally.
4. Enhanced the technology breakouts by adding hydropower, since some DG stakeholders are interested in the emerging micro-hydro market. ■

5. Supplemented the application breakouts by adding two applications: "other non-interconnected" and "spinning reserves". This clarifies the results by not aggregating non-interconnected operating units with interconnected baseload and peaking.
6. Performed a clearer data assignment of units to the emergency/standby application category.
7. Added a cross-tabulation of capacity by application *and* by technology to the reported results, so users have a clearer picture of the nature of the installed base.
8. Provided a table for 1 to 60 MW units that gives capacity by size by regulated/unregulated and owner type/interconnection. This may help regulators.
9. Included a special interest table that examines the growing landfill gas market, by size, technology and application. This may help manufacturers.
10. Analyzed recent trends in DG installation. Sections were added that summarize the characteristics of units installed between 2000 and 2003, and then compare these recent installations to the total installed between 1907 and 2003.

Thus, we anticipate the results being of increased value to existing and new subscribers to this report series. ***The Installed Base of U.S. Distributed Generation: 2004 Edition*** can be ordered from: www.distributed-generation.com.

NATIONAL HYDROGEN ASSOCIATION (NHA) CONFERENCE

The NHA held its 15th annual conference in April, attracting over a thousand participants, way up from 640 the previous year. As a leading forum and voice for development of a hydrogen economy, it is instructive to review how this may affect the DG industry. Conference participants included oil companies, automotive firms, universities and upcoming student engineers, small businesses with niche hydrogen products, national lab and DOE personnel, and about 20 electric utility personnel. Despite limited electric utility participation it is likely that the automotive and power industries are beginning to merge.

This audience reflects the hydrogen industry's pursuit of the Holy Grail of an emission free hydrogen car. Underlying the path to this objective was extensive debate about whether the stationary fuel cell market would precede or follow from a large automotive fuel cell market. Equally uncertain were forecasts that anticipate an automotive fuel cell market by 2010 of 200, 10 thousand, or half a million vehicles. The third major theme was how to unscramble the chicken and egg of hydrogen infrastructure development (highways with fueling stations) and market demand for the cars. Accordingly, today's investors are confused and unwilling to provide significant capital, since the hydrogen market's key players do not yet have one voice or perspective.

Indeed, the high level of uncertainty present during the conference reminds one of the early days of the photovoltaic or the DG microturbine industries. The path forward may be revealed by looking at recent "hydrogen highway" initiatives in British Columbia, Japan, Scandinavia, and now California. Some participants suggested that the U.S. needs to catch up with what has already happened in Canada, Scandinavia and Japan.

Hydrogen's relationship to DG revolves around whether the industry is able to develop sufficient technology and economies of scale to finally provide stationary fuel cells at a price and performance competitive with other DG technologies. The early betting is that this will not happen this decade, but it could happen during the next decade. In any case the hydrogen industry has the potential to bring significant R&D into the DG arena.

The 16th annual NHA conference is scheduled for April 26-28, 2005 in Washington D.C.

Ask the DG Monitor

Question: Have any makers of solid oxide fuel cells, in the 5 kW to 50 kW range, announced prices of functional packages of $1,100/kW or less and available this year?

G.L., Renton, Washington

Dear G.L.,

With mass production, companies are predicting their small solid oxide fuel cells (SOFCs) could drop to as low as $1,100 kW or less, and DOE has set an optimistic goal of $400/kW for products coming from their Solid State Energy Conversion Alliance (SECA) program. History has shown that in many cases DG manufacturers quote rather low predictions for equipment cost, trying to attract investment capital, and often do not meet their goals.

Currently, we are not aware of any SOFC that will be on the market this year at $1,100/kW or less. Most of the currently available small fuel cells are using proton exchange membrane technology (i.e. Plug Power, Inc.) and prices for these fuel cells are significantly higher than $1,100/kW. Many companies are pursuing using SOFC technology for small stationary fuel cells, but their products will not likely enter the commercialization stage of development this year.

For additional information, see the following companies that are involved in the small SOFC marketplace:

- *Acumentrics*
- *Ceramic Fuel Cells, Ltd*
- *Delphi*
- *Fuel Cell Technologies*
- *Global Thermoelectric* (now part of Fuel Cell Energy)
- *Honeywell* (now part of GE)
- *Siemens Westinghouse*
- SOFCo-EFS
- *Sulzer Hexis Ltd*
- *Versa Power*
- *Ztek Corporation*

Good luck as you pursue this opportunity! ■

DG NOTES

June 24, 2004 - **SunTechnics** and **SunPower Corporation**, a Cypress subsidiary, today announced a distribution partnership at the Intersolar 2004 tradeshow. The deal gives SunTechnics exclusive rights to market $40 million to $75 million of select SunPower high-tech photovoltaic products in Europe through 2005. Made in Germany, SunTechnics' two new modules feature SunPower's unique all-black appearance and all-back-contact solar cells that have conversion efficiencies of more than 20 percent.

June 23, 2004 - **Capstone Turbine Corp.** (Chatsworth, CA) announced that its first beta C200 system surpassed a 1,000-hour operating milestone. The beta unit was installed and commissioned May 3, 2004, at the National Fuel Cell Research Center and Combustion Lab at the University of California, Irvine (UCI). Continuous, full-load operation began two days later. The 200 kW system was developed in conjunction with the U.S. Department of Energy's Advanced MicroTurbine System program.

June 14, 2004 - **DTE Energy** today broke ground on its Hydrogen Technology Park, a pilot project that will model a complete, multi-use hydrogen energy system. DTE Energy was selected by the U.S. DOE as its partner to develop, build and operate the project that will create hydrogen gas from tap water and use that gas in fuel cell generators and to refuel fuel cell vehicles. The project will result in a system capable of delivering about 100,000 kilowatt-hours of electricity per year.

June 10, 2004 - **ReliOn**, the leading provider of high-reliability fuel cell solutions for backup power applications, announced that it has received a $363,781 contract from the US Army Corps of Engineers' Construction Engineering Research Laboratory (CERL) for installation and testing of its fuel cell systems in critical military applications. ReliOn will be installing its Independence 1000(TM) 1kW fuel cells and outdoor enclosures in a total of nine application sites at three military facilities.

June 10, 2004 - **Northern Power Systems Inc.** (NPS, Waitsfield, VT), a subsidiary of **Distributed Energy Systems Corp.,** has signed a $2 million cooperative agreement with the **U.S. Department of Energy** (DOE) to advance the development of the company's NorthWind® 100 (NW 100) wind turbine. The Northern team includes major subcontractor **GE Energy,** which will participate in the design effort through its Wind Energy segment, and the GE Global Research Center. The DOE's National Renewable Energy Laboratory and its National Wind Technology Center will be providing technical assistance on the project. ■

CONFERENCES

Southwest Renewable Energy Conference
August 4-6, 2004
Flagstaff, Arizona

Energy 2004
August 8-11, 2004
Rochester, New York

World Renewable Energy Congress VIII and Expo
August 29 – September 3, 2004
Denver, Colorado

World Energy Engineering Conference and USCHPA Meeting
September 22-24, 2004
Austin, Texas

Small Engine Technology Conference
September 27-30, 2004
Graz, Austria

DG for Power Reliability and Security
September 27-28, 2004
Atlanta, Georgia

Ninth National Green Power Marketing Conference
October 4-6, 2004
Albany, New York

3rd Annual Renewable Energy Conference
October 11-12, 2004
Melbourne, Australia

Power Systems World – Power Quality Exhibition and Conference
November 16-18
Chicago, Illinois ■