

Combined Heat and Power Newsletter

This winter we are pleased to bring you the latest issue of our quarterly newsletter Combined Heat and Power. This free newsletter will highlight stories and events of interest to the CHP community, and will occasionally provide in-depth insight into the latest “hot topics.”

While our focus is primarily upon the Southeast region, we will also incorporate news from across North America. You can link directly to our sources by clicking “more details” at the bottom of each item. This newsletter will be prepared by the CHPCenterSE and published at the end of each quarter. We welcome your thought and contributions.

To subscribe to the electronic version of this newsletter, please [click here](#). For questions or to provide comments, please send an email to Maureen Quinlan at maureen_quinlan@ncsu.edu.

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Hot Topic: CHP for Wastewater Treatment Plants

Combined Heat and Power systems can be an excellent source of energy savings for wastewater treatment facilities (WWTF) that use an anaerobic digester. Anaerobic digestion is a process by which microorganisms break down waste material in the absence of oxygen, ultimately releasing a stream of biogas. Rather than flare the methane-rich gas into the atmosphere, it can be captured and used to run a CHP system using a turbine, microturbine, reciprocating engine or fuel cell. According to the US EPA, there are nearly 80 WWTFs in the U.S. that utilize CHP, and most employ reciprocating engines. Facilities can meet part of their electricity demand through efficient, onsite renewable power, and regulate the temperature of their digesters through the captured waste heat.

To learn more about CHP at WWTFs, see the additional resources and recent news items listed below.

EPA Factsheet

[Energy Savings and Energy Reliability for Wastewater Treatment Facilities](#)

EPA Strategic Market Analysis

[Opportunities for and Benefits of Combined Heat and Power at Wastewater Treatment Facilities](#)

Midwest CHP Application Center

[Applications and Markets- Wastewater Treatment Facilities](#)

\$400,000 Awarded for CHP System at MA Wastewater Treatment Plant

The City of Pittsfield has received one of nine grants awarded by the Massachusetts Renewable Energy Trust in December for renewable energy projects in the state. The city's wastewater treatment facility currently employs an anaerobic digester to breakdown the waste, which creates biogas. A 195 kW CHP system will be installed to capture this biogas which is currently being flared. The biogas will be used to create electricity for the site, and waste heat which will be used to further treat the sludge in the digester. The CHP system ultimately reduces the electricity demand of the plant, and reduces the environmental impact of flaring biogas.

Of the \$3 million awarded in this round of funding for Renewable Energy Trust projects, the City of Pittsfield received \$400,000. The funds for the trust come from renewable energy charges on electric bills which total \$25 million a year.

[More Details](#)

City of San Leandro, CA Contracts with Siemens to Build Cogen Facility

In October, the City of San Leandro approved a plan to build a 330 kW CHP facility at their Water Pollution Control Plant (WPCP) which processes 6 million gallons of municipal and industrial wastewater every day. Methane gas, which is currently being flared at the facility, will be captured and used to fuel reciprocating engines to produce electricity for water treatment operations. Waste heat will be collected and used to raise water temperature to the required level for treatment.

The new CHP plant will reduce energy use at WPCP by 60%, a significant savings as the facility is the city's largest single consumer of electricity. This translates to a greenhouse gas reduction equivalent to planting 1,500 trees each year. This will aid San Leandro in meeting its goal of reducing greenhouse gas emissions 25% below 2005 levels by 2020.

[More Details](#)

City of Gresham, OR and Veolia Water Receive National Recognition for Wastewater Plant

The National Council for Public-Private Partnerships (NCPPP) recognized Gresham, Oregon and Veolia Water North America with the 2008 Public-Private Partnership Award in November. The award "recognizes exemplary projects and services that illustrate best practices and innovative approaches in the use of public-private partnerships. " In 2005, the City contracted with Veolia to manage the operations and maintenance of their wastewater treatment plant, which processes 20 million gallons a day, with the goal of improving the community's infrastructure and environment. Veolia operates the cogeneration system at the plant, which is fueled by methane gas created during the water treatment process. The plant creates enough methane to supply half of its electrical needs, reducing emissions at the facility and saving the city over \$600,000 so far.

[More Details](#)

News from the Southeast

TVA Issues RFP for Renewable, Clean Energy Power Supply

In December, the Tennessee Valley Authority issued a request for proposals for projects that will supply them with renewable and/or clean electricity. Eligible renewable technologies include solar, wind, hydro, geothermal, and biomass. Combined heat and power is eligible as a "clean energy technology". TVA is seeking up to 2,000 MW of clean and renewable power generation by June 2011. TVA will contract for the output of renewable and clean energy generation through power purchase agreements. Proposals are due January 16, 2009.

TVA serves over 9 million customers in the southeast. They forecast that over 50 percent of their total power generation will come from zero or low carbon-emitting sources such as nuclear and renewable energy by 2020.

[More Details](#)

News from across North America

Oak Ridge National Lab Report Details Potential of CHP

On December 1, Oak Ridge National Lab (ORNL) released its report *Combined Heat and Power: Effective Energy Solutions for a Sustainable Future* which highlights the opportunities and challenges facing CHP today, and the potential environmental and economic benefits of increasing its deployment in the U.S. According to ORNL, CHP currently accounts for 9% of U.S. power generation capacity. If this were increased to 20% by 2030, the following benefits would be realized:

- 5.3 quadrillion Btu of fuel saved annually, the equivalent of almost half current U.S. household consumption
- 1 million "green-collar" jobs created, \$234 billion in new investments through 2030
- reducing CO2 emissions by 800 million metric tons per year, equivalent of taking half of current U.S. passenger cars off the road

The report emphasizes that CHP must be a key element of a clean energy portfolio because it is a technology that already exists today, it can run on a number of different fuels, and it has a variety of possible applications.

[More Details](#)

Plug Power, National Grid, DOE Partner on Micro-CHP Project

On the heels of their July, 2008 announcement that they were awarded a \$500,000 grant for micro-CHP fuel cell commercialization (See [Vol. 1, Issue 3](#)), Plug Power announced in November that they will partner with National Grid and the Dept. of Energy to conduct a field trial of their new micro-CHP GenSys fuel cell system. The 5 kW Gensys fuel cell system runs on natural gas, and is designed for residential and small commercial applications.

National Grid will select one of its customers in New York to host the system, and will collect critical real-world performance data. The system will be designed, installed, and tested by Plug Power, who estimate a 20-40% reduction in home energy costs and 35% reduction in home carbon emissions using their system. Data collected from this field trial will be used to refine future system designs.

[More Details](#)

Factsheet Details Federal CHP Tax Credits

As we reported in the last issue of the CHP Newsletter, the Energy Improvement and Extension Act of 2008, which passed in October, includes a number of favorable new and updated provisions for CHP. In November, the EPA Combined Heat and Power Partnership published a useful 2-page overview of these CHP-related items:

- CHP Investment Tax Credit
- Accelerated Depreciation
- Energy Credits for Fuel Cells and Microturbines
- Renewable Energy Production Tax Credit

[More Details](#)

CHP Eligible Under New Arizona Net Metering Rule

The Arizona Corporation Commission (ACC) established rules for state-wide net metering on Oct. 16, which applies to all investor owned utilities and cooperative utilities. Net metering is the billing arrangement between a customer and their utility, whereby the customer's energy generation has the same value as the energy consumed by the customer, allowing the customer to offset part of their energy bill. In Arizona, net metering will now be available to customers generating electricity with solar, wind, hydroelectric, geothermal, biomass, biogas, fuel cells, and combined heat and power.

There is no specific limit on system size, but the system must be sized to meet all or part of a customer's electric load. There is also no limit on the overall amount of net metered systems that can be hooked up in the state. Utilities are not permitted to charge net metered customers any additional fees. If in a given billing period, the customer generates more electricity than it uses, the excess will be credited to the next bill. Despite having been one of the few states with no net metering rules last year, Arizona was able to establish a solid CHP-friendly policy, which earned a "B" in the [2008 Edition of Freeing the Grid](#).

[More Details](#)

Biomass CHP Helps Sacramento Meet Renewable Goal

Waste wood products from Washington will soon be used to power 38,000 California homes. Iberdrola Renewables announced in October that it will be selling the entire electrical output of a 55 MW biomass CHP plant in Tacoma, WA to the Sacramento Municipal Utility District (SMUD). Currently under construction, the CHP system will be owned by Simpson Tacoma Kraft Company and used to produce steam for their pulp and paper mill operations, fueled by waste wood products. This is the largest renewable CHP project to be built in the US in the last 10 years, according to the USA Biomass Power Producers Alliance. The electricity that is produced by the system will be delivered by Iberdrola to SMUD, who has a goal of meeting 23% of their customers' energy needs through renewable resources by 2011.

[More Details](#)

New Technology Allows CHP System to Run on Glycerin

Aquafuel Research Ltd. announced in early December that they've developed a technology that allows a standard diesel generator used in a CHP application to be fueled by glycerin. Based in the U.K., Aquafuel will soon be looking for a U.S. biodiesel plant to use as a test site. A standard diesel generator is altered slightly so it can use the new combustion cycle called the McNeil cycle. Glycerin could be a very advantageous fuel as it is nontoxic, biodegradable, has a very high flashpoint, produces few emissions, and is a byproduct of biodiesel production. Rather than selling their glycerin on the open market, Aquafuel's new technology would allow biodiesel producers to cleanly and efficiently offset some of their onsite electricity and heat demand.

[More Details](#)

Honda Introduces New Micro-CHP Unit for Your Home

American Honda Motor Company, Inc. revealed its new Micro-sized CHP (MCHP) Deluxe unit at the Greenbuild International Conference in Boston on November 20. The system is designed for residential applications, providing over 3 kW of heat and up to 1.8 kW of electric power, allowing customers to significantly reduce their electric bills and their greenhouse gas emissions. This Deluxe MCHP's production capacity is an improvement over the standard MCHP unit released by Honda in 2007, which could produce a maximum of 1.2 kW of power. The new model also includes a battery and natural gas/propane stand-by generator that can provide back-up electricity in the event of a power failure.

[More Details](#)

Worldwatch Report: CHP Key Element of GHG Reductions

The Worldwatch Institute, an independent research organization recognized for its analysis of critical global issues, released a new report in December titled [Low-Carbon Energy: A Roadmap](#). In it, author and Worldwatch President Christopher Flavin identifies solar and wind power, biomass, green building practices, and CHP as the technologies that will lead us to a decarbonization of the global energy economy. The inefficiency of power production in the U.S. results in enormous amounts of waste heat, equivalent to Japan's annual energy consumption. If this waste heat was instead captured from industry, landfill gas, agricultural waste, wastewater, and other sources using CHP, it would provide 15% of U.S. power needs, facilitating the retirement of old coal plants and reducing carbon emissions.

[More Details](#)

EPA Updates Catalog of CHP Technologies

In December, the EPA's Combined Heat and Power Partnership released an update of their CHP Technologies Catalog, which provides an overview of how CHP systems work and the key concepts of efficiency and power-to-heat ratios. Interested CHP stakeholders can utilize this online educational resource to help identify opportunities for CHP applications. The report includes new cost and performance characteristics for five commercially available CHP prime movers: microturbines, reciprocating engines, gas turbines, steam turbines, and fuel cells.

[More Details](#)

Environmental Revenue Streams Can Improve Economics of CHP Project

In addition to more traditional sources of financing like tax credits and clean energy grants, CHP projects can also take advantage of the less familiar environmental revenue streams (ERS) to help offset project costs. An ERS is simply a payment by an entity to the owner or developer of a renewable/clean energy system for the environmental attributes of that system (i.e. greenhouse gas reductions). In December, the EPA CHP Partnership released a new report titled [*Environmental Revenue Streams for Combined Heat and Power*](#). Three main types of ERSs that CHP may qualify for are:

- cap and trade programs
- offset programs
- renewable energy certificate (REC) programs

The report describes each program, what programs exist in certain geographical areas, how to tell if a certain CHP project would qualify for one or multiple programs, as well as a case study.

[More Details](#)

Upcoming Events

[National Energy Services Conference & Expo](#)

January 26-29, 2009

San Diego, CA

[EPA Clean DG Policy and CHP Webinar: Output Based Environmental Regulations](#)

January 29, 2009

[Regional Energy Forum: Making Energy Work](#)

February 3, 2009

Raleigh, NC

[DistribuTECH 2009](#)

February 3-5, 2009

San Diego, CA

[International Colloquium on Environmentally Preferred Advanced Power Generation](#)

(ICEPAG 2009)

February 10-12, 2009

Newport Beach, CA

[IDEA's 22nd Annual Campus Energy Conference](#)

February 10-13, 2009

Durham, NC

[Renewable Energy Technology Conference and Exhibition \(RETECH\)](#)

February 25-27, 2009

Las Vegas, NV

[Clean Technology 2009 Conference & Expo](#)

May 3-7, 2009

Houston, TX

About Us

The Southeast CHP Application Center (CHPCenterSE) was established in 2004 for the US Dept. of Energy. Its mission is to provide application assistance, technology information, and educational support for CHP in the Southeastern U.S. The CHPCenterSE is co-located at [Mississippi State University](#) and [North Carolina State University](#). We encourage you to visit our website, www.chpcenterse.org, for more information.
