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COMPOSTING • RENEWABLE ENERGY • SUSTAINABILITY



## AFTER THE STORM

Debris management strategies when  
Mother Nature delivers knockout blows.

GREEN RETURNS ON NATURAL CAPITAL INVESTMENTS

ROLLING OUT RESIDENTIAL ORGANICS COLLECTION • DIGESTATE TREATMENT VIA COMPOSTING  
BIOGAS POWER IN VERMONT • PUNTA CANA RESORT LINKS TOURISM AND SUSTAINABILITY

## Washington, D.C. SECTION 1603 DIGESTER FUNDING DEADLINE

To inject capital into renewable energy projects, the 2009 American Recovery and Reinvestment Act (ARRA) included Section 1603, which allows project developers to receive a U.S. Treasury Department grant in lieu of tax credits. The grants, for 30 percent of eligible project investments, are available for renewable electricity projects qualifying for federal business energy tax credits or production tax credits. President Obama's extension of President Bush's tax cuts at the end of 2010 included extension of the Section 1603 grants through 2011. This extension has led to a flurry of new digester projects, which need to either begin "significant" construction by the end of 2011, or qualify for a 5 percent "Safe Harbor." The American Biogas Council (ABC) sponsored a webinar recently to provide anaerobic digester project developers with an understanding of what those terms mean, and have an opportunity to ask questions directly to Ellen Neubauer, Grants Program Manager for Sec. 1603 at the U.S. Treasury.

The first significant point is that the deadline for submitting an application for Sec. 1603 funds is September 30, 2012, not December 31, 2011. "Where the end of the year becomes significant," said Neubauer, "is to determine whether the property is eligible for the funds. To be eligible, the project must begin work of a significant nature or the applicant must pay or incur 5 percent of the total project costs [the Safe Harbor]. Those are actual costs, not estimated." Work of a "significant nature" includes any physical work started on the project, but excludes preliminary work such as planning, designing or preparing the land. Construction that is under way must be continuous, i.e., it will continue from that point until the project is finished. Another way to meet the requirement is to show the work is under contract. "Projects may meet the requirement by showing that physical work has started under a contract," explained Neubauer. "The contract must be binding in writing and must be entered into prior to the work starting. Purchasing from inventory that is already manufactured does not meet this requirement."

To meet the 5 percent Safe Harbor option, the actual costs must be "paid or incurred" within the meaning of the Internal Revenue Service's regulations.

"The cost is not 'incurred' until 'economic performance' occurs, i.e., the goods or service is 'provided to the applicant'," added Neubauer. One measurement is that the property paid for has been delivered to the project. The costs include all costs (and only those costs) that can be included in the basis, she noted. "The amount is fixed, the goods are delivered and that is when the project developer incurs the cost to meet the 5 percent safe harbor."

Outreach to members of Congress has been ongoing by ABC to extend the Section 1603 program beyond 2011. For more information, visit [www.america.biogascouncil.org](http://www.america.biogascouncil.org).



## Durham, North Carolina GOOGLE AND DUKE HARNESS HOG WASTE POWER

In 2008, Duke University and Duke Power teamed up to develop an anaerobic digestion system at Lloyd Ray Farms in Yadkin County, a swine finishing facility with nearly 9,000 pigs at any given time. Methane from 80,000 gal/day of swine manure is collected in a 2 million gallon capacity custom, in-ground, lined and covered anaerobic digester; biogas is used to turn a 65-kW Capstone microturbine with the electricity used to power the farm. Liquids from the digester are aerated and treated for ammonia and pollutants, after which the water is used for irrigation or barn flushing.

The system began operating in May, and Google got on board as an investor in September. Google committed in 2007 to become carbon neutral, which includes buying carbon offsets, and this project is among those the company has invested in to procure the carbon credits. Tatjana Vujic, director of the Duke University's Carbon Offsets Initiative, has been with the project since the beginning and admits to many challenges along the way including weather delays and waiting for necessary equipment. She says one challenge stood out: electricity transmission. "We had to learn how to step down the electricity on site from three-phase to single-phase," says Vujic, explaining that the microturbines produce three-phase

power and the farm runs on single-phase. "Next time we do it, we will know how and it will be a lot simpler."

The project also serves as an educational facility for students. "It's a great place for students from the university to perform studies and learn directly from the project," adds Vujic. It is also intended as a model for other farmers who want similar systems. "Google's investment," she says, "was a sign of success."

## Pune, India SUGARCANE BIOGAS PLANT

Spectrum Renewable Energy Pvt. Ltd., a biogas company that designs, builds, owns and operates biogas projects in India, is constructing one of the largest sugarcane waste to Compressed Natural Gas (CNG) facilities in the world. The \$6.2 million, 100 tons/day facility in the state of Maharashtra in India will produce 9,000 kg (nearly 20,000 pounds) of CNG and 35,000 kg (more than 77,000 pounds) of high-value fertilizer daily. "We are providing an innovative solution to the sugarcane industry," says A.V. Mohan Rao, founder and chairman of Spectrum Renewable Energy. "We not only create additional revenue sources — renewable transportation fuel and high quality fertilizer — but also produce tangible and important environmental benefits, including elimination of groundwater contamination and reduction of methane emissions." Spectrum partnered with the Warana Sugarcane Cooperative Society to build the project. Spectrum will sell the CNG to Warana for \$0.68/kg less than current gas prices for use in its fleet of vehicles. Project construction is scheduled for completion by March 2012.

India is the second largest sugarcane-growing nation in the world, producing more than 350 million tons of sugar annually. Along with sugar, molasses and bagasse (the dry pulpy residue left after the extraction of juice from sugarcane), one of the residues of the sugarcane process is press mud, which is used as a low-grade fertilizer component when mixed with distillery waste. Nine million tons a year of press mud are produced in India.

CNG has been successfully established as a renewable transportation fuel in India; New Delhi, the capital, has the world's largest fleet of public buses running on CNG. The price is 60 percent lower than the current average rate of \$5.69/gallon for gasoline.

## **Syracuse, New York GOT MANURE? AgSTAR WANTS YOU!**

AgStar's 7th National Conference takes place March 27-29, 2012 in Syracuse, and will be cohosted by Cornell University's PRO-DAIRY Program, the New York State Energy Research and Development Authority and USDA-Natural Resources Conservation Service. The two-day national conference and tradeshow will focus on anaerobic digestion (AD) and other viable manure management systems. This year's theme is "Got Manure? Enhancing Economic and Environmental Sustainability." An optional one-day tour will visit select New York on-farm integrated manure handling/treatment systems utilizing AD technology and various collection, treatment, storage and application techniques.

AgSTAR — a collaboration between the USEPA, USDA and the DOE — is an outreach program designed to reduce methane emissions from livestock waste management operations by promoting the use of biogas recovery systems. Learn more at <http://www.epa.gov/agstar/news-events/events/conference12.html>.

## **Eugene, Oregon WWTP RESOURCE RECOVERY CENTERS**

Increasing numbers of cities are mining their jurisdictions' waste for new treasure. Cities the size of Las Vegas as well as smaller communities like Klamath Falls, Oregon, are experimenting with turning their effluent into resources, according to Dawn Lesley of Kennedy-Jenks in Eugene, Oregon. In British Columbia, such innovation has enabled a \$1.5 million project that captures heat from treatment plant effluent and concentrates, pumps and distributes it through the Okanagan College campus. A 250 kW power plant in Millbrae, California, receives commercial cooking grease to power a biodigester as part of an overhaul by energy-giant Chevron of an aging 75 kW biogas-powered generator at the city's water pollution control plant. Another example is CleanWater Service's Durham facility in Tualatin, Oregon, which took advantage of a problem in the Portland suburb by pulling out material that might otherwise gum up the works from a side stream to use as a highly-concentrated, high-value fertilizer. One wastewater authority, the four-jurisdiction LOTT alliance near

Olympia, Washington, shares its headquarters and labs with an education center known as the Water Education and Technology [WET] Center in order to teach about water treatment, pollution and recycling. Elsewhere, some public works officials are studying how to take advantage of gravity in water conduits to form "water hammers" to spin turbines. "Elevation change is an opportunity to get energy," Lesley said.

## **Rosemont, Illinois INNOVATION CENTER LAUNCHES SUSTAINABILITY AWARD**

The Innovation Center for U.S. Dairy, in cooperation with the Dairy Research Institute, has launched a U.S. Dairy Sustainability Awards program to recognize dairy farmers, businesses and collaborative partnerships delivering outstanding economic, environmental and social benefits that help advance sustainability in the dairy industry. The awards are divided into three categories: dairy farm, dairy processing/manufacturing and energy conservation/generation. Nominations for the inaugural awards are being accepted through December 1, 2011, at [US-Dairy.com/Sustainability/Awards](http://US-Dairy.com/Sustainability/Awards).

"The U.S. Dairy Sustainability Awards highlight the dairy industry's longstanding commitment to healthy people, healthy products and a healthy planet while showcasing that sustainability makes good sense as well," says Larry Jenson, president of Leprino Food and chair of the Innovation Center. Nominations are open to all segments of the U.S. dairy value chain — from farm to table. Learn more at [US-Dairy.com/Sustainability/Awards](http://US-Dairy.com/Sustainability/Awards).

## **San Jose, California BIOGAS POWERED DATA CENTER**

Silicon Valley-based Bloom Energy is targeting data centers looking for greener and more-efficient power. The nine-year-old company's solution is an industrial-sized fuel cell — about the size of a large refrigerator — which can be fueled by biogas produced from dairy farm manure, decomposing food waste or landfill gas. In late July, the U.S. division of Japanese telecom company NTT Communications Corp. announced plans to install five "Bloom Boxes" at its Lundy data center. The five units have total energy output capacity of about 500 kW and will enable energy production of more than 4.2 GWh annually as well as reduce CO<sub>2</sub> emissions.

## **Tillamook County, Oregon BIOENERGY FEASIBILITY STUDY**

The Tillamook County Solid Waste Authority recently released the findings of a feasibility study to evaluate the potential for anaerobic digestion (AD) of locally-generated wastes such as animal mortalities, manure and FOG (fats, oils and grease). The Tillamook area wasteshed includes 110 local dairies in Tillamook County and the surrounding area that are estimated to have a herd of 32,000 milking cows generating about 233 million gallons/day of manure (96,000 dry tons at 10 percent solids). There also are about 1,700 tons/year of animal mortalities from area dairies.

Tetra Tech NUS was hired to assess the waste streams and recommend processing and technology options. Tetra Tech produced conceptual process designs and life-cycle financial analyses for two potential digester configurations: a complete-mix AD system including manure from 3,000 milking cows, 1,700 tons of mortalities, FOG (fats, oils, grease) and other feedstocks; and a larger scale facility, including the same feedstocks but manure from a total of 6,000 milking cows. These AD configurations were combined with biogas utilization approaches to come up with three scenarios evaluated in greater detail: 3,000 cow and mortality coupled with CHP (combined heat and power); 6,000 cow and mortality coupled with CHP; and 6,000 cow and mortality coupled with CNG (compressed natural gas) and use. The Tillamook region already has several operating digesters and others under construction, so available capacity to upload power to the grid is limited and couldn't be calculated with confidence, notes the study report. Ultimately, Tetra Tech recommended Scenario 3. The Solid Waste Authority is determining next steps. For the full report, go to: [www.co.tillamook.or.us/gov/solidwaste/ResourceRecovery.htm](http://www.co.tillamook.or.us/gov/solidwaste/ResourceRecovery.htm).

## **Haviland, Ohio MIXED ORGANICS DIGESTER**

In late 2010, the Ohio Department of Development awarded \$10 million in grants to 11 projects that planned to use anaerobic digestion to convert feedstocks — such as municipal solid wastes, food and farm wastes and other biomass or waste materials — into electricity, heat, fuel and other biobased products. The program was funded through the American Recov-

ery and Reinvestment Act's State Energy Program. The grant recipients included Haviland Co., which was awarded \$1 million to own and operate an anaerobic digester in Paulding County. Construction of the \$3.5 million digester got under way this past summer. It will process about 120 tons/day of mixed organic waste streams, says quasar energy group, which is building and will own the facility in collaboration with a local company. Energy from the 1 MW plant will be sold to the neighboring Haviland Plastic Products Company. Start-up is projected for late 2011.

## **Washington, D.C. REAP AWARDS ANNOUNCED**

More than \$27 million in loans and grants for more than 500 agricultural producers and rural small businesses in the U.S. to implement renewable energy and energy efficiency measures in their operations were announced last month by USDA Secretary Tom Vilsack. The grants and loan guarantees are being provided through the Rural Energy for America Program (REAP), a 2008 Farm Bill initiative. One project to receive funding is in Kirkwood, Pennsylvania. Jay Clifford Sensenig will receive a \$309,733 grant to install a codigestion system to process more than 16,800 tons/year of dairy, hog and chicken manure from four farms along with food waste. The system is expected to generate over 879,000 kW/year of electricity; the host farm uses 232,000 kW annually, so excess energy will be sold to the local utility. REAP grants can finance up to 25 percent of a project's cost, not to exceed \$500,000 for renewables and \$250,000 for efficiency.