



U.S. Department of Energy
Energy Efficiency and Renewable Energy

Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

State Energy Advisory Board

Community Renewable Energy Deployment Briefing

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U.S. Department of Energy

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- **EERE supports renewable deployment in many forms**
 - Publications and Presentations in many venues
 - Web access to various resources and references
 - Annual market evaluations and analysis for progress to goals
 - Outreach programs to interested communities
- **Solar America Cities**
- **Wind Powering America**
- **Geo Powering the West**
- **Integrated Deployment for communities**
 - New Orleans, LA efficiency and renewables in rebuilding city
 - Greensburg, KS clean community efforts
 - Hawaii Clean Energy Initiative
 - Alaska village renewable energy integration
 - National Science Foundation Polar Programs
 - Energy Development in Island Nations (EDIN)
 - Community Renewable Energy Development
- **Weatherization and Intergovernmental Programs**
 - SEP and EECEBG components of community plans



In August & September 2005, Hurricanes Katrina and Rita flooded over 80% of New Orleans. DOE answered the call for help & placed staff onsite to focus on rebuild support.



Langston Hughes Elementary

- **Schools**
- All new schools (over 40) will now be at least 31.5% more efficient than code by 2020
- Provided energy audits on 50 schools to assist major renovations (>35 planned) in achieving 25% more EE than code by 2020
- **Homes**
- Project Home Again has built 45 affordable homes meeting DOE Builder's Challenge (34% more efficient than code) with 55 more planned
- Habitat for Humanity now building homes to Energy Star level (15% more EE)

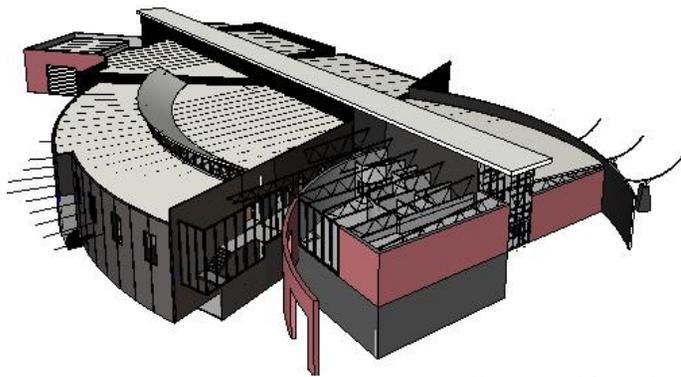


Project Home Again



On May 4, 2007, an EF5 tornado decimated 95% of Greensburg, KS, driving the 1500 residents from their homes and local jobs. DOE and many Federal, State, local, and private sector partners, helped Greensburg rebuild Green.

- **Rebuilding Efficiently**
- 161 homes avg. 42% less energy use than code
- 31 commercial buildings to achieve at least LEED certification (>30% EE)
- School designed 50% more efficient than code
- Hospital designed to 60% EE & RE savings; first LEED Platinum critical access hospital in U.S.
- **Power Through Renewables**
- 12.5 MW Wind Farm start-up March 2010 providing 100% electricity
- John Deere now North American Dealer for BTI Equipment small wind turbines



County Hospital

Unprecedented Results

- *1st LEED Platinum City Ordinance*
- *Highest Density of LEED Certified & LEED Platinum Buildings in the US*
- *City uses 100% Renewable Electricity*
- *First net metering policy in Kansas*
- *First Eco-Town series for Discovery Channel*



Hawaii's faces energy prices twice the National Average; 7 times the energy cost as a % of GDP compared to the national averages. As a result, DOE and Hawaii joined forces to launch the Hawaii Clean Energy Initiative Jan. 28, 2008 to change the energy future of Hawaii.

Renewable Energy Use

- 40% RPS requiring 30% new RE generation by 2030
- Voluntary Commitment by Utility: install 1100 MW of RE in next 7 years, decoupling, net metering, and feed-in tariff regulations
- Electric Vehicle Infrastructure mandated
- **Energy Use Reductions**
- 30% EE Portfolio Standard by 2030
- First Net Zero Energy Community broke ground 3/10; several more in development
- More stringent Building Codes adopted



Maui Wind Farm

Unprecedented Results

- **First State to require solar water heaters on new homes**
- **Serving as a model for US Virgin Islands and Okinawa**
- **Modeling & Analysis of Highest Variable Renewable Generation Penetration ever done in US**
- **Unprecedented collaborative workshop held July 2008 with all major stakeholders**
- **DOD commitment to meet or exceed 70% Clean Energy goal**



Purpose of Community Renewable Energy Deployment Grant Opportunity

- \$22 Million in project funds for up to 4 renewable deployment projects managed by communities
- To move EERE toward improving knowledge and to promoting acceleration of renewable market adoption
- To support and enable EERE's deployment goals for multiple renewable energy resources and technologies, with the intent of
 - (1) creating jobs
 - (2) stimulating economic growth
 - (3) creating successful RE technology examples for replication
- To support communities with existing renewable energy technology plans that are ready to move into implementation through deploying renewable energy installations.





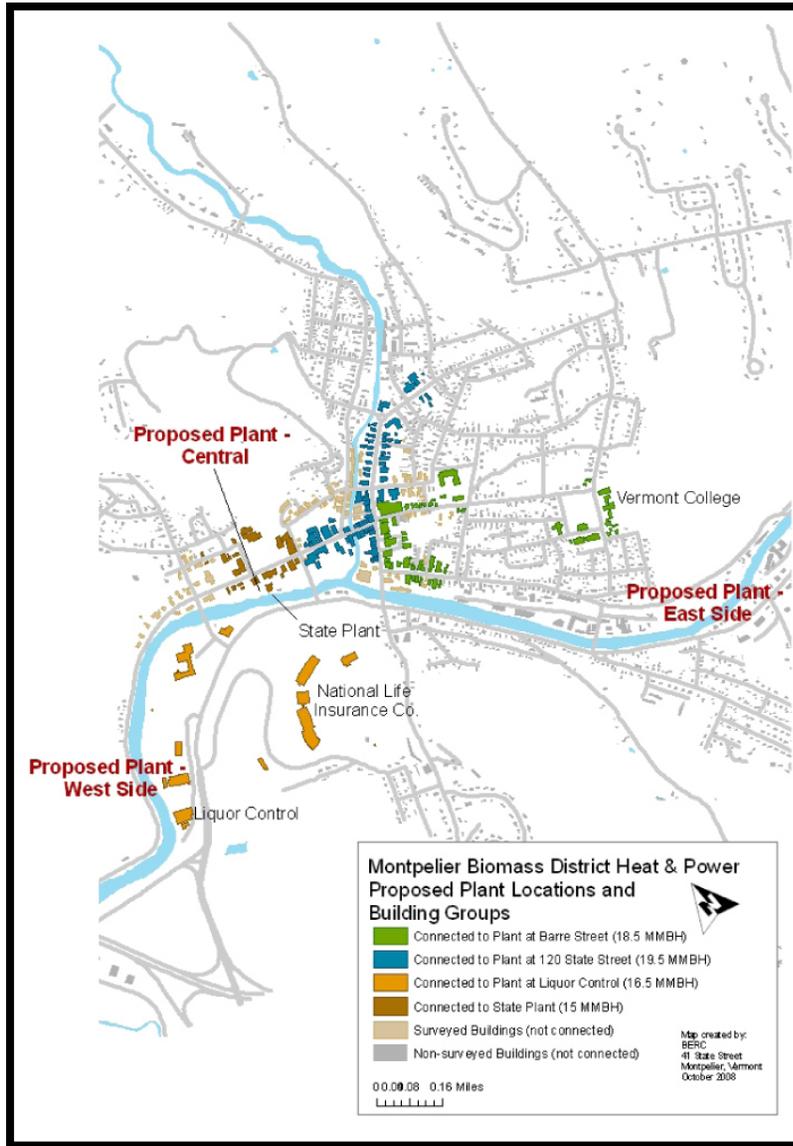
Geographic Diversity of Selected Applicants





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VEOLIA
ENERGY
Veolia Energy North America
99 Summer Street
Boston, MA

City of Montpelier District Energy

The Montpelier Community Renewable Energy Project encompasses the design, permitting, construction, installation, financing, commissioning and operation of a state-of-the-art 41 MMBtu (1200 HP) combined heat and power district energy system fueled with primarily locally-sourced renewable and sustainably-harvested wood chips.

- The project will also identify and implement the optimum ownership and customer marketing and connection strategies.
- As properties are connected to the system, the project will implement efficiency and conservation measures to reduce overall heat load.
- The project includes adoption of financing mechanisms that will enable property owners to implement a variety of efficiency measures and renewable energy strategies.

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District renewable energy to replace the need for individual, building-based boilers, furnaces, and cooling systems. Individual building owners are able to buy their heat (and in some cases, cooling and electricity) from the energy district instead of operating their own boilers, furnaces or air conditioners.

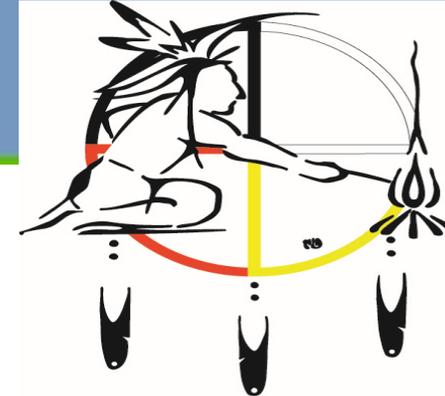
- Rapid and universal conversion to renewable fuels,
- Greater fuel flexibility
- Professional environmental energy management.

The CHP system will be sized to provide heating to an existing ½ million square feet of state-owned buildings in the Vermont Capitol Complex along with a planned expansion of about 240,000 square feet, City-owned properties including schools and the City Hall Complex, and up to 156 additional buildings in the community's designated downtown district, for a total of 180 buildings heating 1.8 million square feet. By also providing 1.8 million KWh of power to the grid, the system will maximize its operating efficiency and reduce thermal costs for users in the community.



By 2013, Montpelier achieves a 50,000 ton annual reduction in greenhouse gas emissions, the equivalent of \$15 million of fuel oil annually and with an investment in the local economy of approximately \$100 million.

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**Forest County
Potawatomi Community**

Forest County Potawatomi Community

FCPC will implement integrated renewable energy plan that will employ several different renewable energy technologies. Tribe to eliminate the vast majority of natural gas and propane to heat in its governmental buildings and more than offset the electricity usage of its on-reservation buildings.

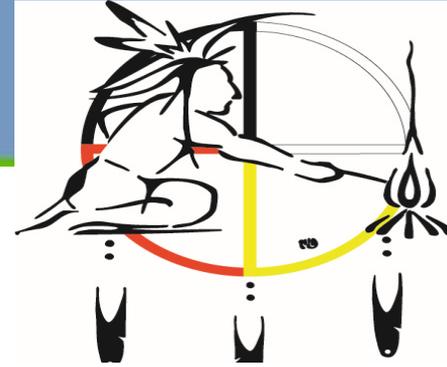
- Tri-generation biomass facility for:
 - heating and cooling Tribal government's Stone Lake site
 - produce approximately 1.25 MW of electrical energy.
- Dried woody biomass boiler heating systems for numerous of the Tribe's on-reservation buildings.
- A biogas digester and 150-kilowatt generation unit that will utilize the Tribe's organic solid waste from several sources, including Tribe-owned facilities, Tribal member homes, septic sewage and municipal solid waste from both Tribal lands and possibly from non-Tribal communities, and waste oil and grease from area restaurants, including the Tribe's restaurants.





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- Generate electrical and heat energy for FCPC reservation usage to replace existing fossil fuels. Initial estimated carbon reduction for the Tribe in excess of 20,000 tons per year.
- Turns low-value wood and waste material into green energy and coal-replacement biomass fuel.
- Preserves and increases forestry and other jobs.
- Other efforts include solar and mixed waste stream application

Renewable technologies will support wide-ranging impact, as it provides a model for local communities to produce their own energy from diverse resources thereby helping communities, and in aggregate, our country as a whole, to become energy independent and thereby improve our national security.





Phillips County 30 MW NECO Wind Project

The objective of this project is to develop utility scale wind energy that offers local ownership.

NECO Wind wants to produce community based wind energy that is sustainable and responsible.

NECO Wind will increase the likelihood of future development of utility scale community wind energy projects in the State of Colorado due to increased understanding and acceptance of community owned wind energy locally and with off-taker utilities.

The initial 30MW phase will generate enough electricity for approximately 9,000 homes

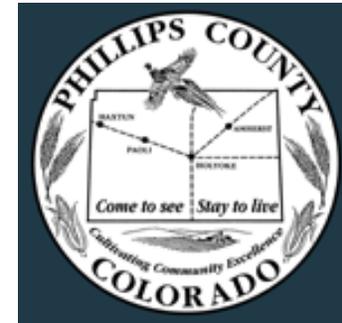
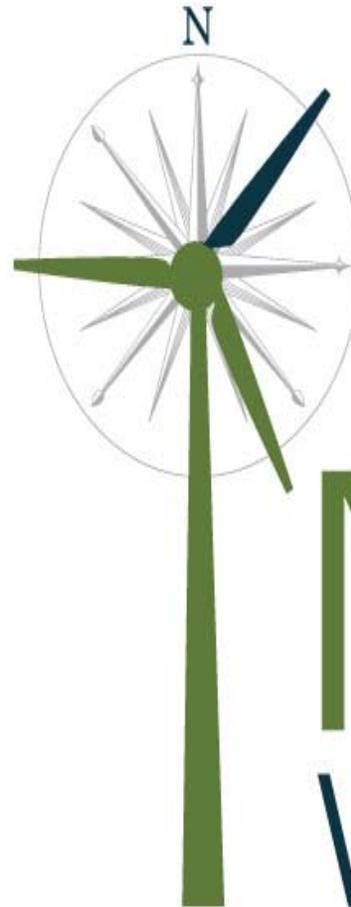




A Community Wind Model

Phillips County has been selected to receive \$2.5 million in federal for the first 30MW phase in hopes of assuring the future economic well-being of Phillips County. NECO Wind proposes to positively impact the local economy by sharing the project's revenues with local landowners and other project participants, by generating local jobs, substantial property taxes, and providing clean renewable energy for the area's primary communities.

Established in 2008 by community members of Sedgwick, Phillips and Logan Counties in Colorado, NECO Wind is managed and professionally developed by National Wind, LLC. As the managing partner, National Wind will oversee the wind project from the initial planning stages until the final construction phase.



NECO
WIND, LLC



Benefits to the Local Economy and Community

NECO approach to wind project development is atypical of traditional models through their inclusion of the local community in the project. Allowing local majority ownership of the project company. Encouraging landowners and the local community to share in the project's proceeds through turbine royalty and land payments, as well as through the gross operating revenues from a successful wind project. Most of the project's economic benefits will remain in the State of Colorado.





SACRAMENTO SOLAR HIGHWAY

The goal of the Sacramento Solar Highway project is to install a 1.5 MW PV system that will establish a blueprint for additional projects throughout the State of California.

- New use for restricted land in urban areas
- Help accelerate market penetration and deployment of solar PV. Resolve PV system technical integration and safety issues with California Department of Transportation (Cal Trans)
- Installation of 300kW of concentrating PV, and 400 and 800 kW of flat plate PV distributed at 2 sites



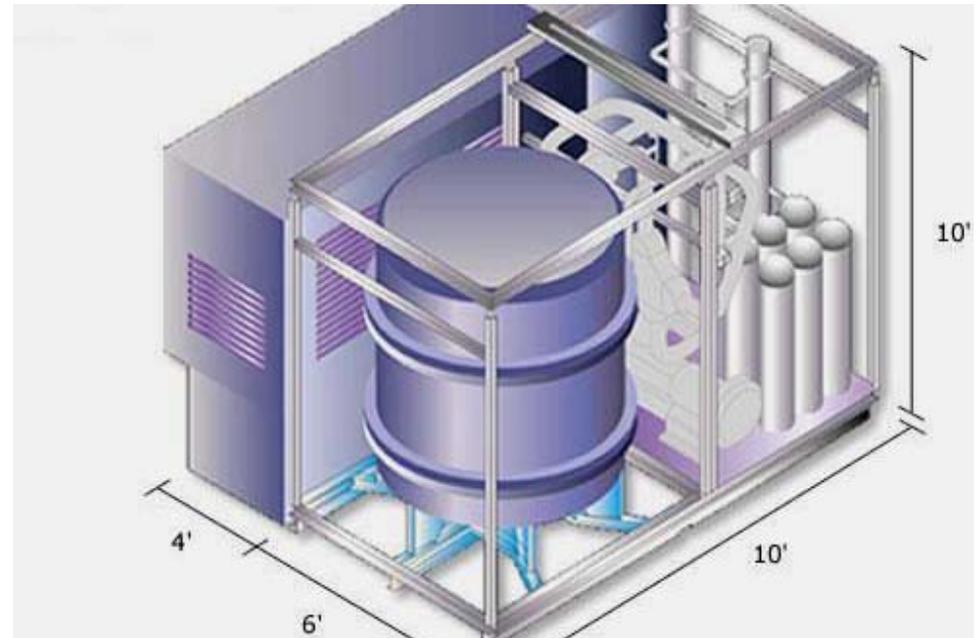


ANAEROBIC DIGESTOR FOR DAIRY FARM

Implementation of an advanced anaerobic digester system (AADS) at Van Warmerdam dairy farm.

This dairy farm has 1,100 dairy cows. The biogas produced will be fed to a solid oxide fuel cell that will generate an electrical output of 700 kW and heat for CHP application.

Implementation of this anaerobic digestion system will help resolve slow market penetration of AD systems for the dairies. Help resolve complex permitting process by implementing zero emission fuel cell technologies.



Above right: complete-mix anaerobic digester;
Right: part of 700 kW CCP fuel cell & micro turbine



The West Village Energy Initiative:

Project will deploy an advanced on-site waste-to-renewable-energy (WTRE) system within a large-scale mixed-use community development.

- WTRE system will be built within a Community Energy Park and combined with other components of the West Village Energy Initiative (WVEI).
- The WVEI, an almost \$75 million project, incorporates an array of on-site renewable energy generation resources, Deep Energy Conservation Measures (Deep ECMs), and smart grid integrating equipment to enable the ground-breaking demonstration of a Zero Net Energy (ZNE) community development,
- Model for other such communities that can inform evolving state and federal energy policies.

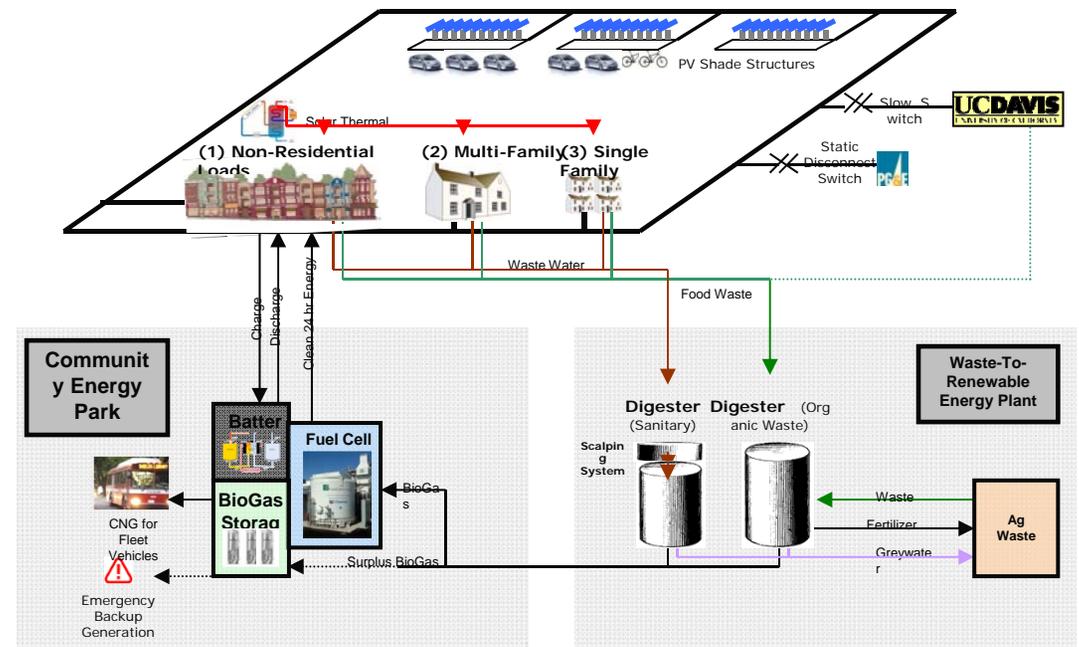


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- Community Waste Receiving and Handling Facility
- Anaerobic Phased Solids (APS) Digester create onsite renewable biogas
- Bio-methane Upgrade System, which will remove H₂S, CO₂ and other impurities
- Housed alongside the WTRE system within the Community Energy Park
- 300kW fuel cell that will be fueled by the on-site biogas.
 - Not part of DOE project will be an advanced storage battery
- Committed to conduct critical design and engineering
- Enable a secure community electricity grid with increased power reliability and quality,
- Drastically reduced peak energy demand
- Lowers T&D losses and GHG emissions.



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- Planning marketing campaign based on community energy
- Focus on the DOE accomplishments
 - New Orleans
 - Greensburg
 - Hawaii Clean Energy Initiative
 - Alaska energy implementation
- Explore community funding proposals not awarded
- Work with California Energy Comm. (RESCO) awardees
- Coordinate with other DOE deployment efforts
- Search for partners to expand community energy concept