PMC-EF2a
(2.04.02)

U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION

RECIPIENT: Foster Glocester Regional School District **STATE:** RI

PROJECT TITLE : Ponaganet Alternative Energy Lab and Biomass Facilities Project

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
	DE-FG36-08GO88069	GFO-09-112-001	GO88069

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:

Description:

B5.1 Actions to conserve energy, demonstrate potential energy conservation, and promote energy-efficiency that do not increase the indoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, designers), organizations (such as utilities), and state and local governments. Covered actions include, but are not limited to: programmed lowering of thermostat settings, placement of timers on hot water heaters, installation of solar hot water systems, installation of efficient lighting, improvements in generator efficiency and appliance efficiency ratings, development of energy-efficient manufacturing or industrial practices, and small-scale conservation and renewable energy research and development and pilot projects. The actions could involve building renovations or new structures in commercial, residential, agricultural, or industrial sectors. These actions do not include rulemakings, standard-settings, or proposed DOE legislation.

Rational for determination:

The Foster Glocester Regional School District in Rhode Island would demonstrate the feasibility of an alternative energy lab and biomass facility. In total, this project consists of nine tasks. Tasks 2 and 6 through 9 were approved on March 18, 2009 (GFO-09-112). In this analysis, DOE evaluates Tasks 1, 3, and 4. Task 5 was dropped from the proposal.

Task 1 - Design, construction and equipping of an Energy Lab at Ponaganset High School
DOE funding for this task would be used to convert existing space within the high school into a new Energy Lab and Computer Classroom. The Energy Lab would be equipped with concrete block walls, a dry chemical fire suppression system and a fire rated ceiling. The funds would also be used to purchase a storage building (about 24' x 24') in which to store vehicles for the Ponaganset Alternative Energy Program. This storage unit would be placed on school property near the garage door in the Energy Lab. Lastly, DOE funding would be used to purchase a steel storage locker (about 9' x 7') to be housed outside as well. This locker would contain all hydrogen and biodiesel components used in the Energy Lab. The storage locker would meet all OSHA and EPA guidelines and regulations for chemical storage. Foster Glocester School District has all permits in place to perform this work.

Tasks 2 was approved on March 18, 2009 (GFO-09-112).
Task 3 - Biomass Hydronic Heating Systems at Ponaganset High School and Middle School DOE funding for this task would be used to purchase and install a Chipec Wood Energy System wood chip gasifier & boiler systems at the current high school and middle school. Each school built an addition to house the boiler and store the wood chips. Clean and quality hardwood sawmill fuel chips would be provided by Hull Forest Products located in Connecticut. The fuel is wood chips that are made from wood waste that is a by-product of various wood-industry operations such as lumber milling, logging, or municipal clearing of downed trees. Typically the materials from which the chips are made would otherwise decompose, releasing CO2 and methane or would be land-filled.

Wood Chip Specifications:
- Type of wood: Screened wood required. Green hardwood is preferred, but other green softwood is acceptable. Bark is allowable to limited degree. No excessive fines.
- Maximum size: 2½" x 2½" x ¾"
- Minimum size (nominal): ½" x ½" x ¼"
- Maximum sawdust content: 5%
- Maximum moisture (wet basis): 45%
- Minimum moisture (wet basis): 15%
- Maximum mineral content: 2%
- Prohibited materials: Rocks, dirt, metal, paints, wood "flour", sanding dust, and any substance having an explosive

potential in confined space. Also prohibited are: wood pieces larger than the above maximum size; "stringy" chips; pressure-treated wood of any kind; construction debris; ice or snow; paper (whole or shredded); trash; metallic objects; plastics of any kind; and all other foreign materials.
• Chips must be reasonably uniform in size, so as to minimize problems with fuel handling equipment.
3. Fuel (wood chips) come from Hull Forest Products located in Connecticut.
The biomass boiler fuel would otherwise have gone to a landfill or would decompose. It is anticipated that no live trees would be cut down for use as fuel. The Foster-Glocester Regional School District already has a list of bidders for the wood chip supply. These biomass heating systems would be used to heat the Foster-Glocester high school and middle school while providing a learning opportunity for students.

The biomass boiler system produces approximately 1.5 to 125 million Btu/hour dependent of fuels type. The middle school gasifier would have an output range of 334,000 - 3,340,000, while the high school would have a range of 679,000 - 6,790,000. The middle school is estimated to use 2.5 to 3 tons of fuel per day. The high school is estimated to use 4.5 to 5 tons of fuel per day. The middle school is estimating delivering of wood chips once a week. The high school is estimating delivery of wood chips two to three times a week. The boiler system would be about 28' long by 22' wide and 9' tall on school property. The school district plans on burning wood chips from Hull Forest Products. Chipec (the boiler manufacture), guarantees that the boiler system would not exceed the following emission levels:
• Total Particulates – 0.1 lbs/MMBTU as measured by EPA Method 5
• CO-0.18 lbs/MMBTU(heat input)
• SO2-0.025 lbs/MMBTU(heat input)
• NOx – 0.28 lbs/MMBTU(heat input)
• Acrolein – 0.00004 lbs/MMBTU (heat input)
• Manganese – 0.001 lbs/MMBTU (heat input)

The Rhode Island Department of Environmental Management, Office of Air Resources, has issued construction permits for the biomass boiler systems at Ponaganset Middle School and Ponaganset High School. The installation permit requires the following before obtaining an operating permit: "Within 180 days of startup of the boiler, performance testing shall be conducted to demonstrate compliance with the emission limitations for nitrogen oxides, carbon monoxide, sulfur dioxide, PM10, PM2.5 and total nonmethane hydrocarbons. Additionally testing would be conducted to measure emissions of the following listed toxic air contaminants for comparison to the emission rates used in the air quality modeling: acrolein, arsenic benzene, hexavalent chromium, formaldehyde, manganese, phosphorus and polycyclic organic matter."
The permit numbers for the Ponaganset High School issued by the State of Rhode Island is Approval Nos. 2012 & 2013. The Middle School's Approval Nos. 1989 & 1990. Because of the auger setup system and the fact that all of the carbons are burned and emnants of the chips are stored in sealed steel covered/hazmat type container, there should be minimal odors from the operation.

The Foster-Glocester Regional School District claims there is no net waste produce by the biomass boiler systems. However, a weekly requirement to remove 2 to 10 gallons (depending on average heating load during the week) of clean wood ash from the gasifier and multicyclone, which would be used a fertilizer for landscaping, and the Agriculture/Horticulture program. The ash would be produced only during winter months.

Task 4 - Biofuels Education and Demonstration
The DOE funds for this task would be used to purchase a biodiesel production unit and ion exchange "dry wash" towers for the Energy Lab located onsite. The production of biodiesel would be used in fleet vehicles at the school. The biodiesel production system requires no technical installation or facility modifications. The system is capable of making up to 50 gallon batches and production is expected to under approximately 500 gallons per year.

Ponaganset's Alternate Energy Lab curriculum would be delivered through an integrated, student-centered, sustainability curriculum where students and teachers are immersed in project-based learning experiences. These experiences would involve various academic disciplines and relevant themes that require students to apply what they know in first hand.

According to Foster Glocester Regional School District, Newpor Biodiesel would dispose of the glycerin form the biodiesel production; all hazardous waste would be disposed of according to local, state, and federals regulations. According to Foster Glocester Regional School District, a Chemical Hygiene Plan, waste disposal, and safety protocols are in place.

The school district claims the following safety protocols are in place:

Laboratory Safety
• Spill containment kits
• MSDS logs
• Personal Protection Equipment
• Proper chemical storage
Combustion Safety Devices

• Water safety valve: A temperature activated valve that supplies water to the top of the metering auger if the temperature in the feed auger is over 190 degree F.
• Air lock: Creates a physical break between fuel source and gasifier.
• Fuel level arm: Prevents the gasifier from being over filled with fuel.
• Feed screw: Feed screw operates until all material is discharged into the gasifier. This creates a second physical break between fuel source and the gasifier.
• Draft proving switch: If the draft fan fails, the fuel feed system stops delivering fuel to the gasifier.
• High/low exhaust temperature alert.
Mechanical Safety Devices
• Gasifier lid safety system: An intergraded system of limit switches that prevents the lid from being opened or closed by mistake.
• Gasifier lid safety bar: Once the lid is opened, a pin is inserted into the safety bar that locks the lid open. The safety bar also acts as a back up to the lid lifter assembly.
• Auger access door limit switches: Turn off augers when access doors are opened to prevent bodily harm.
Boiler Safety Devices
• ASME approved relief valves & components
• Two (2) Low boiler water cut off devices
• Hi-limit control: If boiler temperature exceeds the desired temperature the unit shuts down.

Based on the information above, this project's impacts to the human and natural environment can be deemed less than significant and this project would qualify for Categorical Exclusion B5.1.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

None Given.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 2/11/10

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager