

## Crawford Central School District Woody Biomass Project

### The Challenge

The Crawford Central School District, Crawford County Career and Technical Center, and the Meadville Recreation Complex in north-western Pennsylvania currently spend more than \$600,000 annually for electricity and natural gas. These three facilities were concerned about the volatility in the cost of fossil fuels and predicted increases in electric rates. They also shared a desire to reduce the carbon dioxide released into the atmosphere when burning fossil fuels and explore options to save money by using renewable biomass energy sources.

### The Solution

Wilson Engineering Services, a member of the Northeastern Area Woody Biomass Technical Assistance Team, proposed a central heating plant to serve all three facilities, which are in close proximity to each other. The Crawford Central School District, Crawford County Career and Technical Center, and the Meadville Recreation Complex have now entered into a Joint Operating Agreement to install a combined heating and power (CHP) biomass system that is fueled by renewable woody biomass and produces electricity.

The project has a total cost of approximately \$3.5 million. This includes \$940,000 in funding from a PA DEP Energy Harvest ARRA Grant, a U.S. Forest Service Northeastern Area State and Private Forestry Woody Biomass Utilization Grant, and a PA DCED Alternative and Clean Energy Grant. The balance of the project is financed by a bond issue. Wilson Engineering Services provided system design services and helped the school district manage the project.

### Resulting Benefits

This system will replace 80 percent of the annual cost of natural gas and 15 percent of the cost of electricity with a renewable energy source and will avoid future capital costs to replace HVAC equipment. This system will allow the three entities some control over future energy costs by replacing volatile fossil fuels with locally produced renewable energy sources. Their annual energy costs are projected to be reduced by approximately \$200,000.



*March 2011 groundbreaking ceremony at the Crawford Central School District in Meadville, Pennsylvania. Photo taken by Wilson Engineering Services.*

The system will be housed in a facility with a boiler room and biomass storage/delivery area. The boiler room will contain an 8 million Btu output biomass boiler, steam turbine, and 1.5 mmBtu of thermal storage. The biomass system will produce steam to drive a turbine; the exhaust heat from the turbine is captured in the thermal storage unit and distributed to the three facilities to supply space heating and domestic hot water. The turbine generator will operate at varying output rates depending on heat demand producing 190 kW at maximum output. The project meets local, State, and Federal economic development goals of promoting and creating green jobs that involve renewable energy by providing a market for biomass-based energy equipment and a market for renewable fuel. This renewable energy project will stabilize the annual energy costs of the three facilities while supporting the local renewable energy economy.

### Sharing Success

WERC is committed to supporting owners and managers of facilities considering the use of wood energy throughout the eastern hardwood region. Facility owners or managers considering wood energy should contact the WERC Woody Biomass Coordinator Lew McCreery at 304-285-1538 or at [lmccreery@fs.fed.us](mailto:lmccreery@fs.fed.us) for more information.

*Using Wood as Renewable Energy video @ [http://yourerie.com/fulltext?nxd\\_id=162256](http://yourerie.com/fulltext?nxd_id=162256)*

## Central Crawford County School District Project Summary

### Annual Energy Profile

25,000	Mcf Natural Gas Offset
510,000	kWh Electricity Produced from Renewable Energy
2,700	Tons Wood Chips Used
1,575	Tonne CO <sup>2</sup> Reduction

### Combined Heat and Power System

8.0	mmBtu Steam Boiler
190	kW Steam Turbine
250	Tons Wood Chip Storage
6,000	Gallon Thermal Storage Tank
4,000	Feet of Insulated District Heating Pipe
VFD	Pumps for District Heating System

### Financials

System Cost \$3,530,240

#### Financing

Bond Issue (Net interest rate 4.16%) \$2,589,742

#### Grant Dollars

PADEP Energy Harvest ARRA Grant \$500,000

USFS Woody Biomass Utilization Grant \$200,000

PADCED ACE Grant \$240,498

Annual Energy Savings \$200,000

### Benefiting Partners

Crawford County School District (CCSD)

Crawford County-Career & Technical Center – includes:

PENNCREST School District; Conneaut School District; Crawford Central School District

Meadville Area Recreation Complex – includes:

City of Meadville; Vernon Township; West Mead Township; Crawford Central School District



USDA Forest Service  
**Northeastern Area**  
*State and Private Forestry*

#### For more information, contact:

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