



CRAWFORD CENTRAL SCHOOL DISTRICT BIOMASS CHP DISTRICT ENERGY PROJECT



The Crawford Central School District (CCSD), Crawford County Career & Technical Center (CC-CTC), and the Meadville Recreation Complex (MARC) cooperated on implementation of a Biomass Combined Heat and Power (CHP) District Energy System. The system is fueled by locally sourced, renewable wood chips and produces inexpensive heat and electricity for the three cooperating entities. The campus of CCSD's Meadville High School and Middle School has an enrollment of approximately 1,150 students, and the cooperating entities serve three townships.

The system annually replaces 80% of natural gas purchases and 15% of electric purchases with renewable biomass energy. Purchased energy costs are reduced by approximately \$200,000 annually based on 2012 natural gas prices.

The system includes an 8 mmBtu/hr output biomass boiler, 190 kW steam turbine and generator, and 1.5 mmBtu of thermal storage. The biomass system produces steam to drive the turbine/generator which produces electricity. The exhaust steam from the turbine is transferred to hot water through a heat exchanger and the hot water feeds a 6,000 gallon thermal storage unit. The hot water from the thermal storage tank feeds the three facilities for space heating and domestic hot water needs. The hot water distribution system includes 4,000 ft of pre-insulated underground steel and PEX piping.

The project has a total cost of \$3,530,250 with \$940,000 in grant funding provided by the PADEP Energy Harvest ARRA Grant, USFS NE Area Woody Biomass Utilization Grant, and a PADCED Alternative and Clean Energy Grant. Approximately 15% of the project costs were for upgrades within the MARC, and the system provides avoidance of future capital costs to replace HVAC equipment. The system uses locally sourced renewable energy to provide the County with stable energy prices when compared to volatile fossil fuel costs and keeps over \$100,000 in heating fuel expenditures within the local economy. USFS Wood Education and Resource Center program participants provided the initial feasibility study and technical assistance for the project, which allowed the owner to pursue project implementation.

PROJECT AT A GLANCE

Project Cost: \$3,530,240

Grant Dollars:

- PADEP Energy Harvest ARRA Grant \$500,000
- USFS Woody Biomass Utilization Grant \$200,000
- PADCED ACE Grant \$240,498

Project Savings: \$200,000 annual energy savings + over \$600,000 in avoided costs

Energy Profile (annual):

- >27,000 Mcf Natural Gas Offset
- 510,000 kWh Electricity Produced from Renewable Energy
- 2,700 Tons Wood Chips Used
- >1,575 Tonne Net CO₂ Reduction