Project Summary

The Crawford Central School District (CCSD), Crawford County Career & Technical Center (CC-CTC), and the Meadville Recreation Complex (MARC) have entered into a Joint Operating Agreement to install a Biomass Combined Heat and Power (CHP) District Heating System. The system will be fueled by locally sourced renewable biomass and will produce inexpensive heat and electricity for the three facilities. The volatility in the cost of fossil fuels, predicted increases in electric rates, a desire to reduce net carbon emissions, and energy cost savings are the impetus for the project. The three facilities have historic electric and natural gas costs exceeding $600,000 annually.

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. The system will annually replace 80% of natural gas purchases and 15% of electric purchases with renewable biomass energy. Purchased energy costs will be reduced by approximately $200,000 annually. The system also allows for avoidance of future capital costs to replace HVAC equipment, and utilizing locally sourced renewable energy provides the three entities with stable energy prices when compared to volatile fossil fuel costs.

The system will be housed in a facility with a boiler room and biomass storage/delivery area. The boiler room will contain an 8 mmBtu/hr output biomass boiler, steam turbine, and 1.5 mmBtu of thermal storage. The biomass system will produce steam to drive a turbine, producing electricity, and the exhaust heat from the turbine will be captured in the thermal storage unit and distributed to the three facilities for space heating and domestic hot water. The turbine generator will operate at varying output rates depending on heat demand from the facilities producing 200 kW at maximum output.

The project fits the local, state and federal economic development goals of promoting and creating green jobs around renewable energy by providing a market for equipment and a market for renewable fuel. This renewable energy project will provide stability to the annual energy costs of the three facilities while supporting the local renewable energy economy.

ENERGY PROFILE (annually)

- 25,000 Mcf Natural Gas Offset
- 510,000 kWh Electricity Produced from Renewable Energy
- 2,700 Tons Wood Chips Used
- 1,575 Tonne CO_2 Net Reduction

COMBINED HEATING AND POWER SYSTEM

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

FINANCIALS

- 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
- Annual Energy Savings ……. $200,000

PARTIES BENEFITTED

- 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

INITIAL STUDY

- Performed by Penn State University Cooperative Extension
- Penelec Sustainable Energy Fund of the Community Foundation for the Alleghenies provided a $12,500 grant for 50% of initial study cost