



**Oregon Cohesive Wildfire Strategy  
and  
Oregon Wood Energy Cluster**

**Biomass Utilization Feasibility Grants Site Visits**

**October 8-10, 2013**



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**Introduction/Background**

The Oregon Department of Forestry is implementing the Blue Mountain Cohesive Wildfire Strategy and Biomass Market Development project in northeast Oregon with generous funding provided by the United States Forest Service. The pilot project seeks to demonstrate how investments in biomass market development can contribute to a key goal of the Cohesive Wildfire Strategy (CWS); fostering landscape resilience.

Specifically, ODF aims to foster viable markets that will create demand for the low value by-products of forest management and forest products manufacturing. It is hoped that this demand will add revenue to forestland managers, thus augmenting the resources for available reduce fuels and help restore forest health.

Using funds from CWS Blue Mountain pilot project, ODF awarded grants to four projects to assess the feasibility of using biomass as a fuel and/or producing value-added products from low-value biomass material.

Additionally, ODF is partnering with the US Forest Service, Oregon Department of Energy, Bureau of Land Management, and Sustainable Northwest (SNW) to implement the Oregon Wood to Energy Cluster. The Wood to Energy Cluster (WEC) similarly seeks to build wood to energy markets using the low-value byproducts of forest management and the forest products industry. The WEC has made similar investments in project feasibility in central and northeastern Oregon. More information about the WEC can be found at:

<http://www.oregon.gov/energy/RENEW/Biomass/Pages/Wood-Energy-Cluster-Pilot-Project.aspx>

Staff from ODF and SNW conducted site visits to several facilities that received funding from WEC and CWS to gauge progress, identify issues, and strengthen relationships with partners in the region.

**General Interest and Trends**

- Many public schools and facilities considering installing biomass boilers have begun exploring a third party “heat utility” model where the third party would own, operate, and maintain the biomass heat system and the facility/district would simply purchase metered heat. This innovative approach would decrease the capital hurdle that stands as a barrier to the adoption of biomass heat technology.
- Public school administrators viewed Qualified Zone Academy Bonds (QZAB) as the best available financing mechanism for biomass boiler installations in public schools.

- While the size of the biomass heat market is unknown, new projects continue to emerge and contractors reported identifying additional projects beyond those currently funded. Project sponsors noted that up front financial resources (aka grants) for feasibility and engineering studies will continue to be essential to bring these projects to fruition.

### **Site Visit Highlights**

#### **Grant County Wood Energy Cluster**

- ODF awarded \$20,000 and ODEO awarded \$16,000 to Wisewood Inc. to conduct four feasibility studies as part of the Grant County Wood to Energy Cluster. Andrew Haden of Wisewood Inc. is performing the feasibility studies.

#### **Seneca Elementary School**

- The facility currently uses a heating oil boiler with annual expenses of \$20,000 and presents siting challenges due to space and distribution limitations.
- The existing heating load may not be sufficient to justify the capital costs of a new biomass boiler (the school only has 20 students). The district expressed some uncertainty about the future occupancy of the school.



*ODF Unit Forester Rob Pentzer and Grant County School Superintendent Mark Witty at the Seneca Elementary School. Small rural schools such as this can be challenging to convert to biomass due to limited heat loads and uncertain future occupancy. Photo: Marcus Kauffman, ODF*

## Humboldt Elementary School

- The existing heating oil boiler heats the whole campus (with some electrical backup). Approximate annual expenses are \$50,000.
- Base heating load appears sufficient to provide adequate payback to the school district.
- The contractor team is determining where to site the boiler and how to integrate it with existing distribution systems.
- The facility would to adopt a “boiler in a box” design as the existing boiler room does not have sufficient space. The new boiler would be located in a container adjacent to the boiler room, helping to keep costs low.
- Estimated cost to replace boiler system would be \$500,000.



*Andrew Haden of Wisewood (pointing) describes the existing heating system at Humboldt Elementary in Canyon City. The facility spends about \$50,000 per year on heating oil; switching to biomass heat could help lower the school district's heating bills. Photo: Marcus Kauffman, ODF*



*Dylan Kruse of Sustainable Northwest inspects an old oil boiler at Humboldt Elementary.*

*A regional intermediary organization, SNW is a contractor on the Wood to Energy Cluster project and served on the evaluation committee to award ODF's Cohesive Wildfire Strategy funds.*

*Photo: Marcus Kauffman, ODF*

### **Grant County Courthouse, Sheriff's Office and Jail**

- Andrew Haden (Wisewood Inc.) is performing the feasibility study.
- The jail needs its heating systems replaced within the next two years.
- The contractor is determining how to connect the two facilities to a single system and where to site the new boiler.
- A window switch out for the facility recommended by Wisewood Inc. could result in energy efficiency savings of 25%.

### **Pine Eagle School District Heating System**

- ODF awarded a \$9,750 grant to Pine Eagle School District to examine how to connect the existing elementary school, high school, an adjacent agriculture building, and two potential greenhouses to a single district heating system.
- The district contracted with Wallowa Resources, Community Solutions Inc to complete the feasibility study.
- Constructed in the 1950s and 1960s, the buildings are mostly heated with radiant electric heat with and a few small oil furnaces in the gymnasium. About 210 students attend the elementary and high schools.
- The contractor estimates annual electricity expense for the facilities to be \$85,000 with electricity costs at \$.13 KWh.

- Proposed distribution system includes:
  - Hydronic base boards for distribution system with routing through the attic in the gym.
  - Distribution system would be the largest expense. No thermal distribution system currently exists because the building relies on electric heat.
- The district is exploring the use of pellet boiler system which offers ease of operations, low maintenance, and low capital costs as well as system that could burn both chips and pellets. Operations and maintenance for a pellet system would be 1-2 hours per week whereas a chip or dual chip-pellet system would be 8-10 hours per week.
- If the district chooses a chip system three potential suppliers exist including MC Ranch, Integrated Biomass Resources, and Boise Cascade.
- The system would require approximately 180 tons of chips or 125 tons of pellets annually.
- Estimated capital costs for a 700,000 Btu/hr boiler and distribution system are \$250,000. The contractor will provide complete estimate by the end of October.
- The district expressed interest in securing a Qualified Zone Academy Bond to finance construction. They expect a payback of less than ten years.



*Halfway Elementary at the Pine Eagle School District in Halfway, Ore. is exploring connecting the elementary and high schools to a biomass heating system to reduce energy costs and support the use of local forest products.  
Photo: Marcus Kauffman, ODF*

### **Enterprise City Hall District Heating Project**

- ODF awarded \$9,000 to Wallowa Resources, CSI to assess the feasibility of connecting Enterprise City Hall, firehouse, Oddfellows Hall, and the library to a small district biomass heat system.
- The contractor noted that City of Enterprise has limited financial resources with which to finance a retrofit.
- The City is also considering demolishing the current City Hall and firehouse to build new facilities in the next 4-10 years, so a new boiler may not be necessary. As a result, the project faces challenges to advancing, unless they integrate new buildings (like the Courthouse) into the district model.
- The facility could be a candidate project for the 3<sup>rd</sup> party heat contract model.
- Wallowa Resources, CSI estimates the project has a 60% chance of moving forward.



*Wallowa Resources, Community Solutions Inc. is conducting a district heating system analysis that includes the Enterprise City Hall/Firehall, Library, Oddfellows Hall, and the Enterprise Library. Connecting multiple buildings to one system adds complexity but also presents more potential energy savings.  
Photo: Marcus Kauffman, ODF*

### **Wallowa County Fairgrounds District Heating Project**

- ODOE awarded \$9,300 to Wallowa Resources, CSI to complete a feasibility study for a biomass district energy project at the Wallowa County Fairgrounds. Matt King (WR CSI) is performing the feasibility study and assessing seven different facilities for a 3<sup>rd</sup> party heat utility model.
- The combined square footage equals 28,000 with an estimated heat load of 400,000 Btu. The buildings use individual propane systems that could be

connected to a single system relatively easily. Two small wood boilers would satisfy the heat load and require 90-100 tons of chips annually.

- Ideally, building owners would like to install a wood chip boiler, as the fuel is more cost effective. A wood chip system may provide better economics and help make the roughly \$250,000 investment in new equipment pencil out.
- Wallowa Resources CSI estimates that the project has an 80% chance of moving to construction.

### **Integrated Biomass Resources Log Sorting and Merchandizing Project**

- ODF awarded an \$18,500 grant to Integrated Biomass Resources to complete an engineering study on a log sorting and merchandising system to improve operations efficiency.
- The existing facility produces saw logs, firewood, post and poles, and biomass fuel chips. They produce 3,100-3,200 bundles of firewood daily and delivered 300 truckloads last year.
- The owners reported that the commercial firewood market has grown in recent years with more growth expected in the region.
- IBR recently received a \$3.4 million loan via state New Market Tax Credits. The new equipment will allow them to process up to 70,000 green tons of low value logs and add an additional 15 jobs to their payroll.
- The facility remains reliant on log supply from adjacent federal forests and expressed hope that their new demand could be met.



*The new mechanized log sorting line at Integrated Biomass Resource in Wallowa, Ore. Funds from ODF helped the facility secure a \$3.4mil loan to purchase the new equipment and add 15 new jobs. Photo: Nils Christoffersen, Wallowa Resources*





*David Schmidt of Integrated Biomass Resources explains how the new equipment will be put to use. With low capital costs and strong employment outcomes, several communities around the region are interested in small-scale biomass manufacturing facilities. Photo: Marcus Kauffman, ODF*



*(Left) A welder puts the pieces together on the new mechanized log sorting line at Integrated Biomass Resources in Wallowa, Ore. (Right) The biomass heat system at IBR provides heat to dry firewood and electricity to the facility. Photos: Marcus Kauffman, ODF*

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