ADVANCED WOOD ENERGY: WHAT, WHERE, AND HOW

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OUTLINE

• About Wisewood Energy
• Biomass energy basics
• Modern wood energy examples
• What makes a viable project
• Getting to the next step
ABOUT WISEWOOD ENERGY

• **Project Development and Technical Consulting:** Feasibility assessments, project planning, project finance, fuel supply contracts, third-party owned thermal energy generation assets

• **Design/Build:** Biomass energy installations including complete system engineering, procurement and construction (EPC)

• **Clientele:** Communities, Tribes, Industrial Process Heat Users

• **Territory:** OR, WA, AK, CA, ID, MT, CO
Our Mission

We outfit communities and businesses with state-of-the-art biomass energy systems that strengthen local economies, lower energy costs and promote environmental stewardship.

Technology in Service of Community and Environment
Making Energy Work for Rural Oregon

BIOMASS ENERGY BASICS
WHAT IS WOODY BIOMASS?

- Cordwood
- Hog Fuel
- Clean Chips
- Pellets

- Forest Management
- FireWise & Yard Debris
- C&D Waste
BIOMASS ENERGY TECHNOLOGIES

- Single-building space heating
- District heating
- Combined Heat-and-Power (CHP)
- Process heat (steam)
- Utility CHP
MODERN BIOMASS HEAT & COMBINED HEAT AND POWER (CHP)

• **Efficient**: high conversion efficiency (>85%)
• **Clean**: low particulate, NOx and CO emissions
• **Economical**: lowers costs, supports local jobs
• **Sustainable**: supports sustainable forest management, diverts waste streams, low carbon fuel, locally abundant
• **Scale**: renewable energy system appropriately scaled for the resource and demand
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MODERN WOOD ENERGY EXAMPLES
Northport School District
340MBH Pellet Boiler in Northport, Washington
Ketchikan International Airport

500MBH Pellet Boiler in Ketchikan, Alaska
Harney Community Energy
2,327MBH District Heating in Burns, OR
Plumas Health & Human Services Center
400kW Heat, 35kW Electricity ORC in Quincy, CA
Utility Power Plant

1MW Gasification CHP in Scotland
WHAT MAKES A VIABLE PROJECT
PROJECT ELEMENTS

- Wood Supply
- Current Fuel Cost
- Size of Energy Demand
- Funding & Incentives
- Existing Energy System
- Project Champion
WOOD SUPPLY
### Klamath Falls, OR Electricity Statistics

#### Commercial electricity rates in Klamath Falls
- The average commercial electricity rate in Klamath Falls is **8.43¢/kWh**.[1]
- This average (commercial) electricity rate in Klamath Falls is **1.44% greater than** the Oregon average rate of 8.31¢/kWh.[2]
- The average (commercial) electricity rate in Klamath Falls is **16.45% less than** the national average rate of 10.09¢/kWh. Commercial rates in the U.S. range from 6.86¢/kWh to 34.88¢/kWh.[2]

#### Residential electricity rates in Klamath Falls
- The average residential electricity rate in Klamath Falls is **10.38¢/kWh**.[1]
- This average (residential) electricity rate in Klamath Falls is **5.92% greater than** the Oregon average rate of 9.8¢/kWh.[2]
- The average (residential) electricity rate in Klamath Falls is **12.63% less than** the national average rate of 11.88¢/kWh. Residential rates in the U.S. range from 8.37¢/kWh to 37.34¢/kWh.[2]

#### Industrial electricity rates in Klamath Falls
- The average industrial electricity rate in Klamath Falls is **6.75¢/kWh**.[1]
- This average (industrial) electricity rate in Klamath Falls is **20.75% greater than** the Oregon average rate of 5.59¢/kWh.[2]
- The average (industrial) electricity rate in Klamath Falls is **1.2% greater than** the national average rate of 6.67¢/kWh. Industrial rates in the U.S. range from 4.13¢/kWh to 30.82¢/kWh.[2]
SIZE OF ENERGY DEMAND

• Larger demand = larger cost savings
• Cold climates = higher heat demand
• Process loads = more stable heat demand
• Good candidates:
  – Process heating for industry: breweries, food processing, manufacturing
  – Resorts and hotels: 24/7, swimming pools, etc.
  – Healthcare: 24/7, lots of fresh air requirements
  – Schools, community centers, municipal buildings (and/or clusters of these)
FUNDING AND INCENTIVES

EnergyTrust of Oregon

Tax Credits, Opportunity Zones, Depreciation, Etc...

USDA Rural Development

Committed to the future of rural communities.

Forest Service

Department of Agriculture

Oregon Department of Energy

CRAFT
GETTING TO THE NEXT STEP

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KEY QUESTIONS

Do you have a local underutilized wood source?
Where are your largest energy loads?
How reliable is your grid?
Where is new construction happening?

Who are your local entrepreneurs?
Who are your project champions?

What funding sources might exist?
THANK YOU! QUESTIONS?

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