Stimulating Rural Economies with Forest Biomass

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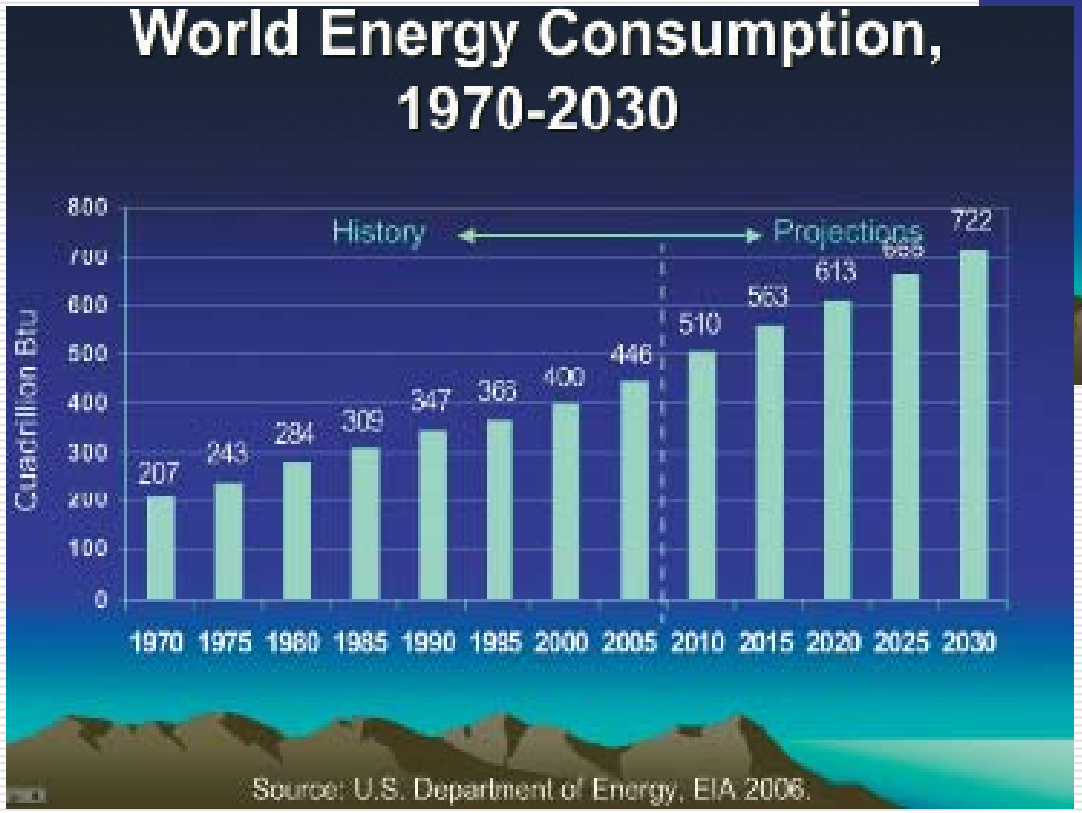
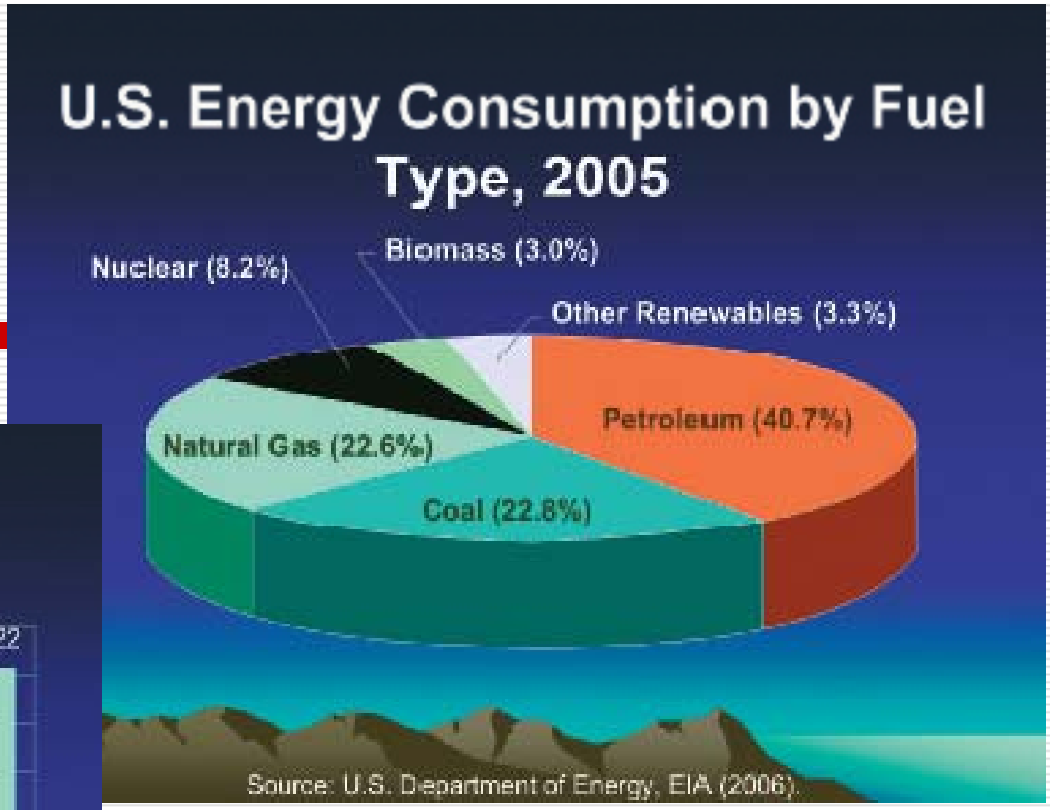
In Perspective...

- **How much forest biomass do we have?**
- **How much energy will it make?**
- **Should we focus on energy or rural development?**

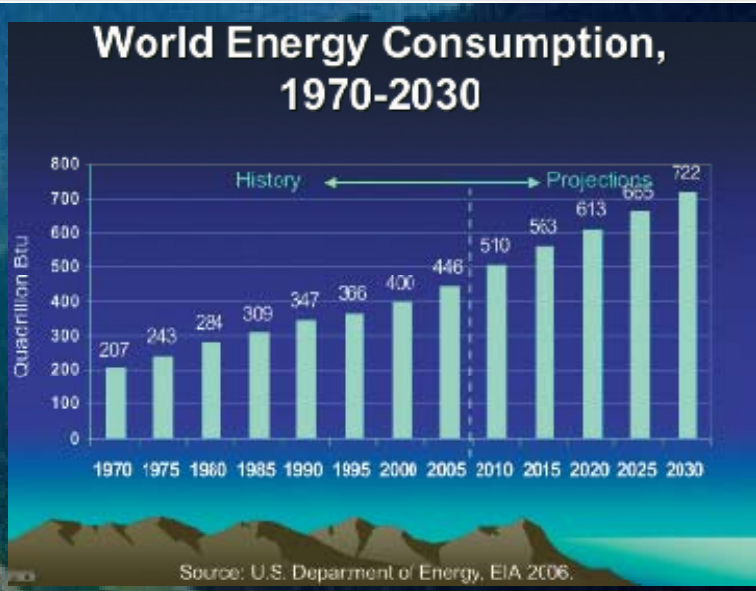
The World Demands More Energy





Biomass at present provides about six percent of Oregon's energy needs – twice the national average, with the potential for much more.

OFRI Special Report, 2007



Bonneville Dam: 1000 MW/hr
= 3.5 Billion Btu/hr
= 1 Bonneville

200 Quadrillion Btu/yr
= 2010 to 2030 Growth of World Energy Consumption
= 6700 new Bonnevilles

Oregon Forest Lands and Harvests

Oregon Land Ownership	Millions of Acres	Current Timber Harvest
Total Land Area	63.0	**3 -4 bbf/yr**
Total Forest Land	30.5	
Federal	18.2	8%
Private	10.2	83%
State, other public	1.1	8%
Tribal	0.5	1%

60% of Oregon's forests are restricted by competitive management policies

Source: OFRI Forest Facts and figures 2009

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Oregon Forest Production, 2005

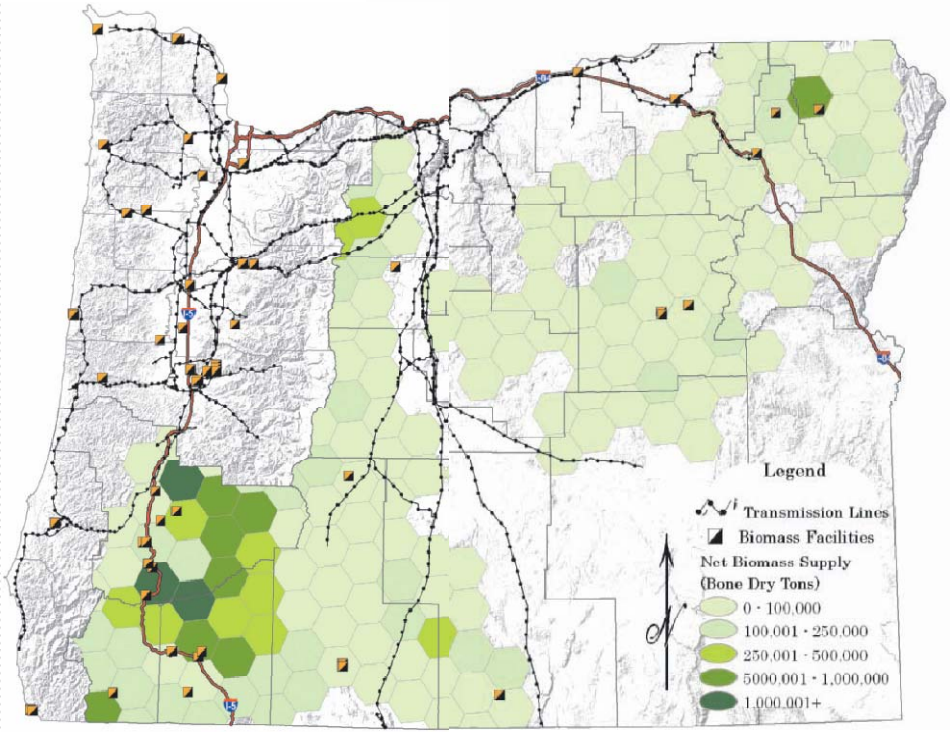
Timber Harvest	**4.2 bbf, log scale**	
Supplied…	Portion	Volume
Softwood lumber	20% (US)	7.4 bbf, lumber scale
Industrial panels	14% (NA)	2,490 m^3
Structural panels	10% (US)	3,033 mmsf, 3/8”
P&P, pellets, bark, exports	???	
Energy	6% (OR)	6.5 million bdt 79 trillion BTU = 2.7 Bonnevilles

Sources: OFRI, CPA, ODOE, FS

Are we the Saudi Arabia of Biomass?

1. Thin dry-land Federal forests for health and fire
   Yield = 1 million bdt /yr

2. Slash recovery from State and Private harvest sites
   Yield = 2 million bdt/yr



Source : OFRI Special Report, 2007

How Much Energy?
3 million bdt/yr = 1.2 Bonnevilles of heat
0.4 Bonnevilles of power

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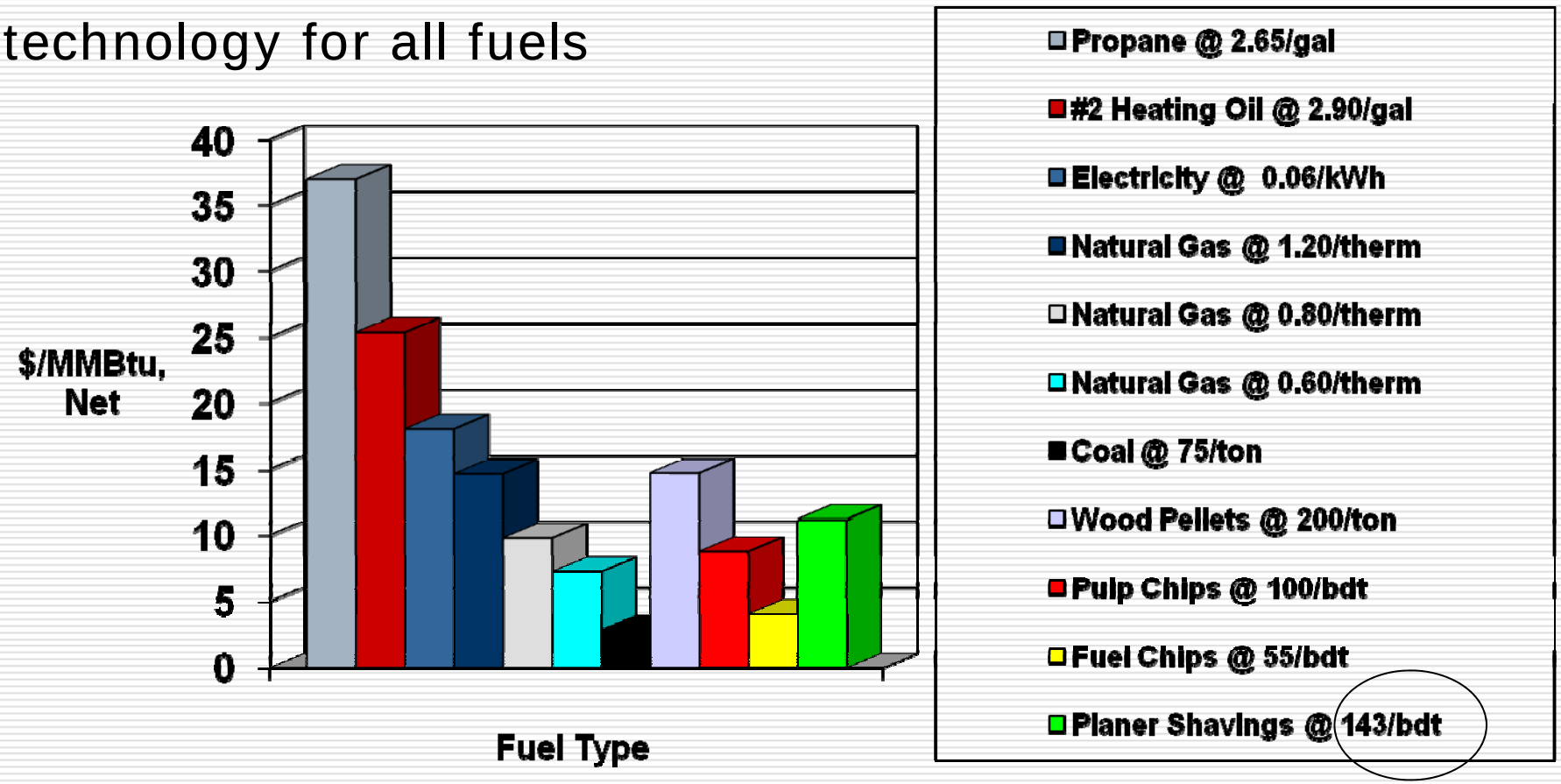
Comparative Cost of Heat

Assumes advanced combustion technology for all fuels

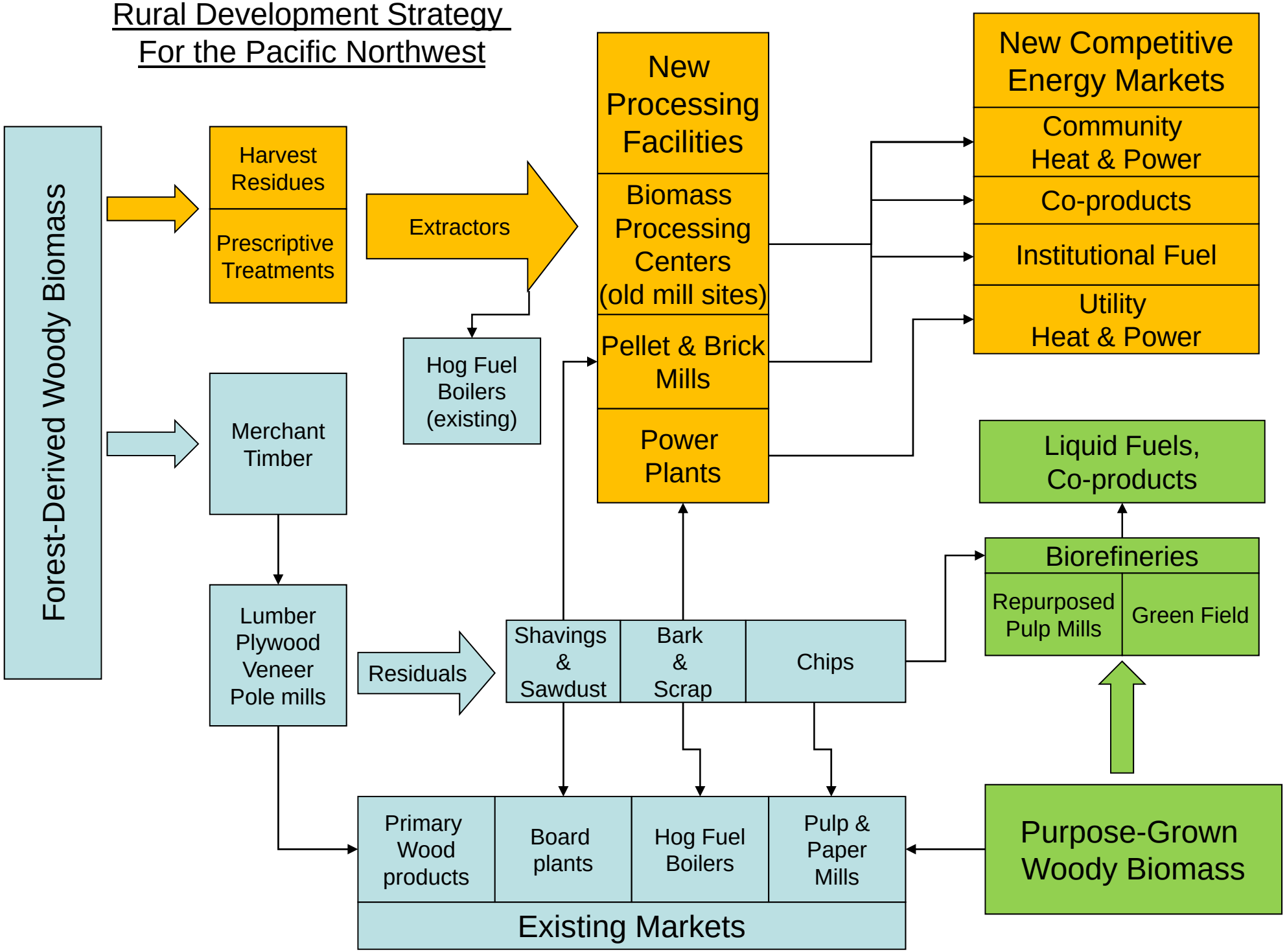


Source: Forest Service Fuel Value Calculator

Converting Logging Slash to Fuel

Fuel Yield:
0.5 to 1.2 bdt per mbf harvested

Woody Biomass Rural Development Strategy For the Pacific Northwest



Essential Elements

1. Bioprocessing Center
   - Receive and process forest biomass
   - Produce a family of products
     - Posts & poles
     - Fuel chips
     - Mulch
     - Compost / soil amendment
     - Heat
2. New energy markets
   - Community heat
   - Institutional heat

The Biomass Processing Center

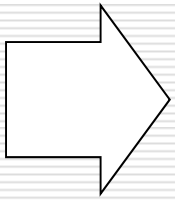
Feed Stocks

100,000 bdt/yr
(25 truckloads/day)

Saw-able logs

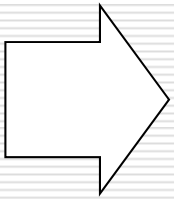
Chip-able logs

Grind-able biomass



Converted Mill Site

Truck dump
Biomass storage yard
Rolling stock
Grinder
Chipper
Drum debarker
Screens
Boiler
Band Saw
Edger
Planer
Power distribution
Maintenance shop
Warehouse
Shipping dock



Products

Boards
Pulp chips
Fuel chips
Hog fuel
Mulch
Soil amendment
Steam

Jobs

In the woods
Truckers
In the plant

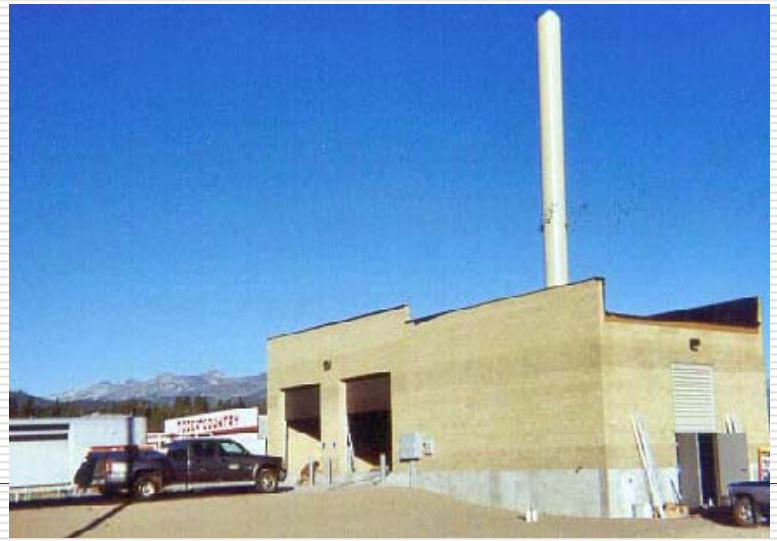
Policy Question: Power Plants or Rural Community Vitality ?

Power Plant

50 MW (1/20 BV)

30,000 truck loads/year

$150 -200 million investment



School Heat

3 MMBtu per hr

<100 truck loads/year

< $1 million investment

Advanced Wood Combustion for Community Heating

High net energy conversion
80-85% v 33% for power

Low capital
Invest in communities not utilities

Minimal transportation “costs”

Pellet fired community heating system in Sweden

- Triple win
  - Sustainable jobs
  - Energy independence
  - Economic vitality – money stays home

Beyond Economics:
Benefits of Wood Chip Heating Systems

- Renewable
- Locally abundant
- Carbon neutral
- Fuel dollars stay local
- Stable fuel prices
- Improve forest heath

This large school was converted from electric heat to a hot water system with a new stand-alone wood boiler plant.

Reference: Wood-Chip Heating Systems:
A Guide For Institutional and Commercial Biomass Installations

Use Woody Biomass as a TOOL to Stimulate Rural Communities

- Simultaneous Development
  - New biomass processing facilities
  - New biomass markets
- Focus incentives on small-scale AWC
  - Enough fuel for 1000+ installations in Oregon
  - Community heating systems may be better markets than power plants
  - Support infrastructure to grow market
- Increase fuel supply from forest operations
  - Use “market pull” not “supply push”

Thank you

Questions?

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