Integrated Biomass Energy Campus: Creating value from woody biomass in Northeast Oregon

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Special thanks to Nils Christoffersen:
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And Dylan Kruse, Sustainable Northwest
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Before we begin

- Energy is just one piece of the puzzle
- Jobs….jobs….jobs
- Oh, and infrastructure
- Bigger picture, broader whole
- The “New Forest Economy”
- Resonance and replicability
- You can do it too…and here’s how

A few stark realities…

Public Forest Land in Eastern Oregon

- Over 60% of the 3 national forests in eastern Oregon are at risk of catastrophic wildfire (2009)
- USFS spent over $145 million in Wallowa County alone on fire suppression last 20 years.
- Impact to watershed function, endangered species recovery, recreational opportunities, and jobs.
- Restoration and biomass utilization = win-win.

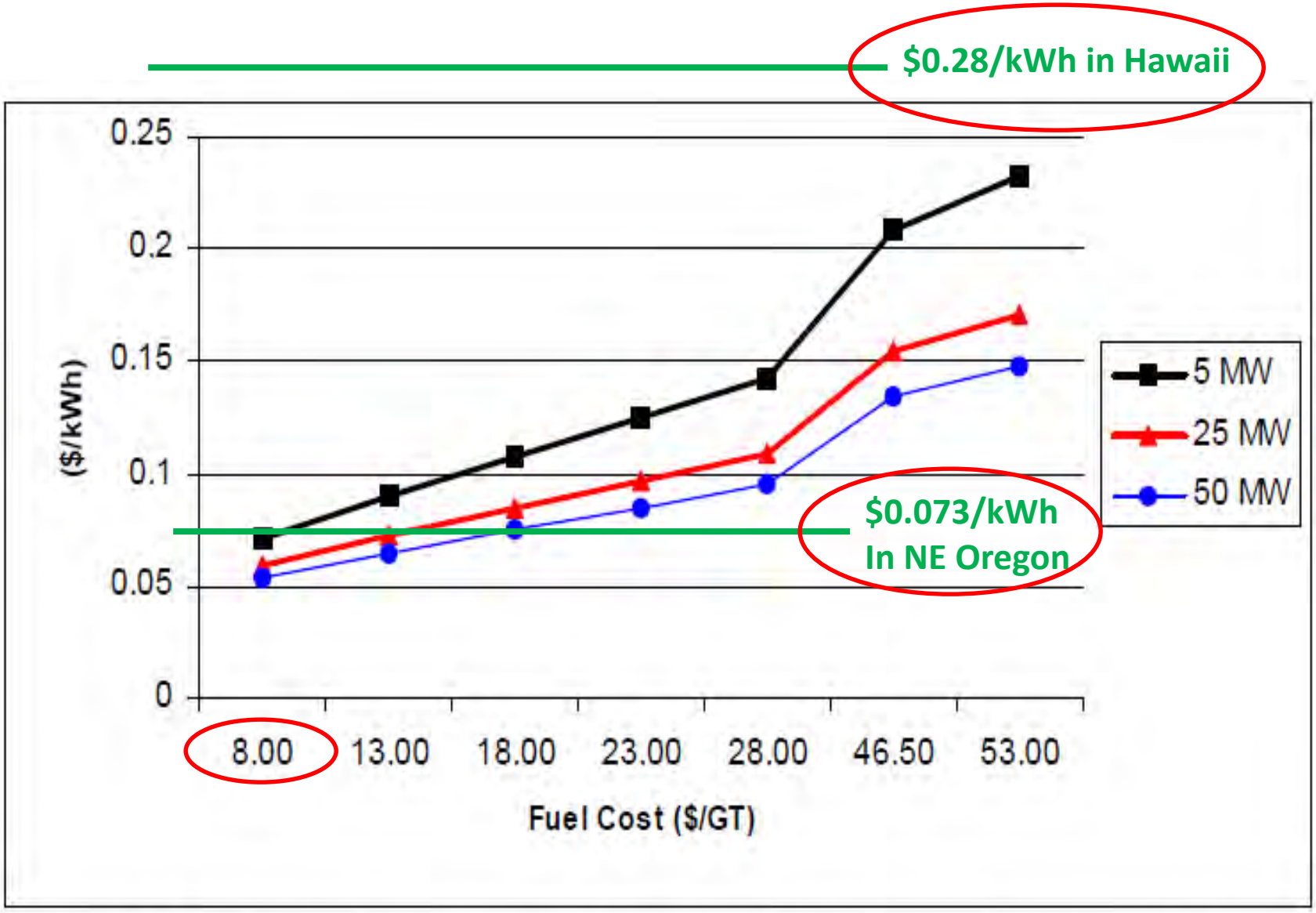


Figure 12-7. Cost of biomass electricity as a function of biomass fuel cost

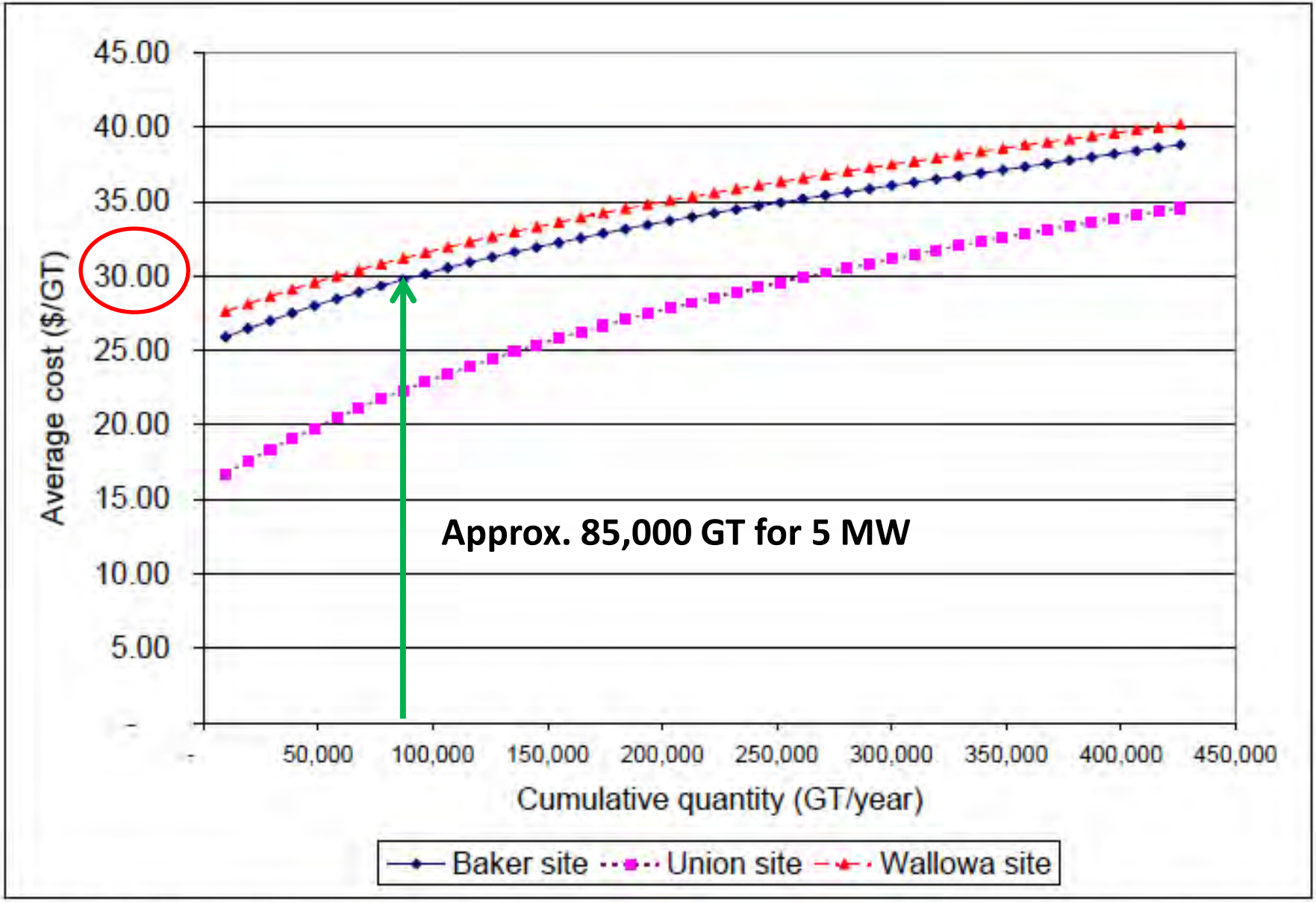


Figure 7-5. Forest biomass supply curves for potential conversion sites in Baker, Union and Wallowa Counties

Table ES-1. Biomass supply quantity and weighted average biomass cost delivered to potential plant sites in Baker, Union and Wallowa Counties

Supply type	Quantity (GT/year)	Average cost ($/GT delivered)		
		Baker County	Union County	Wallowa County
Biomass ethanol				
Agricultural residue	80,009	35.24	31.39	34.31
Forest biomass	425,934	48.66	48.20	49.49
Mill chips	308,794	25.39	15.93	27.15
Veneer cores	1,458	12.46	3.00	14.22
Total	816,195	38.47	34.26	39.51
Biomass power				
Forest biomass	425,934	48.66	48.20	49.49
Mill chips	308,794	25.39	15.93	27.15
Veneer cores	1,458	12.46	3.00	14.22
Total	736,186	38.22	34.57	40.19

NE Oregon Biomass Assessment

Table 3-3. Estimates of annual biomass generation from overstocked land[30]

Biomass source	Total overstocked area (acres)	Annual treated area (acres)	Total biomass generated (GT)	Annual biomass generation over a 20-year time frame (GT/year)
Timber harvest on economically viable forest land	16,100	850	176,316	8,816
Thinning overstocked forest land (assumes 10 GT/year yield)	234,900	11,745	2,349,000	117,450
Total	251,000	12,595	2,525,316	126,266

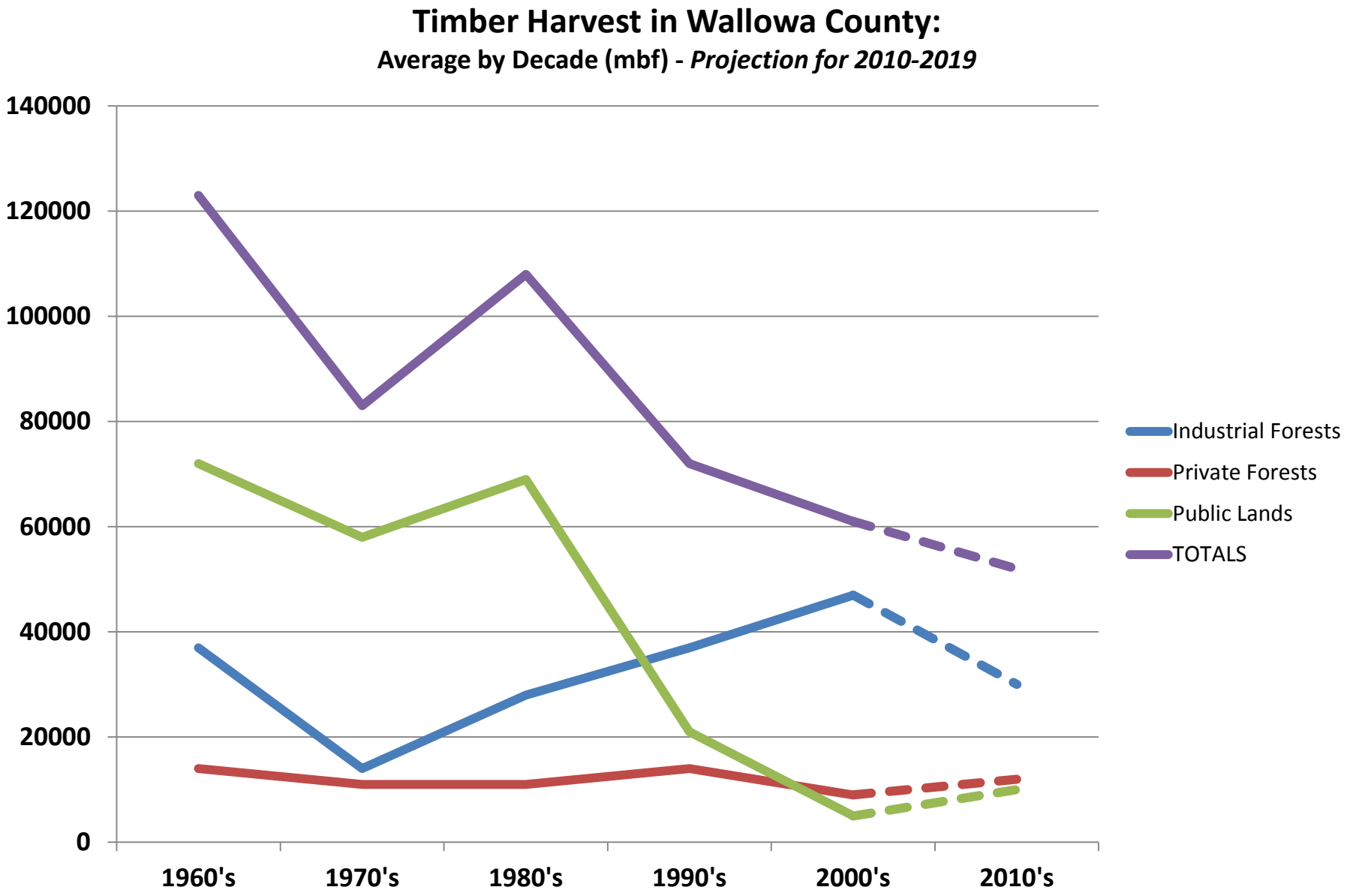
Blue Mountains Assessment – Across 3 Counties

- 251,000 overstocked acres on USFS in commercial management zone.
- Timber harvesting on 16,100 acres of this area could result in a positive net value – producing 9,000 GT per year over 20 years.
- Limited funding and markets to support thinning on remaining overstocked land (234,900 acres).

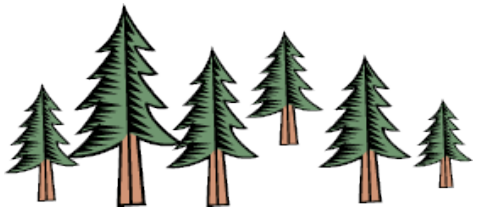
Haypen 3 stewardship contract

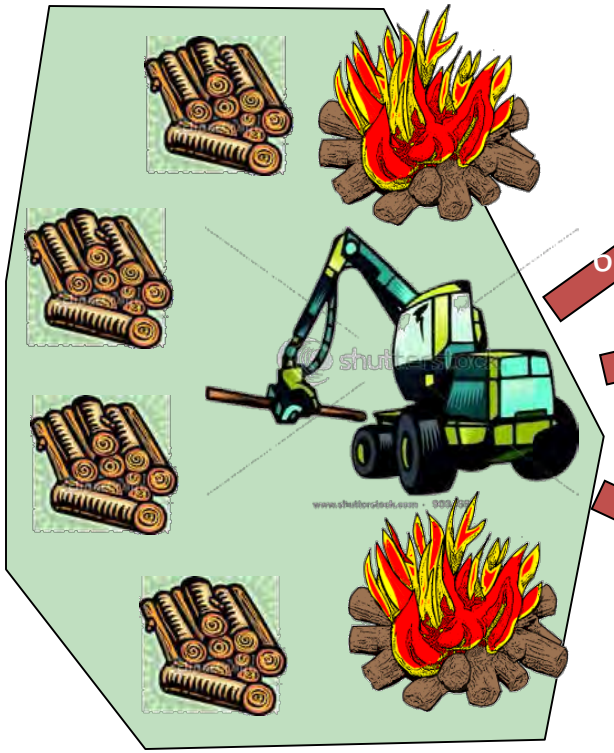
Pulp fiber – (5.0”-6.9”)
33% of cut trees per acre.

Biomass – (1.0”-4.9”)
23% of cut trees per acre.


Timber Harvest in Wallowa County:
Average by Decade (mbf) - Projection for 2010-2019
140000
120000
100000
80000
60000
40000
20000
0
1960's
1970's
1980's
1990's
2000's
2010's
Industrial Forests
Private Forests
Public Lands
TOTALS

“Typical” forest supply chain





60%

4%

35%

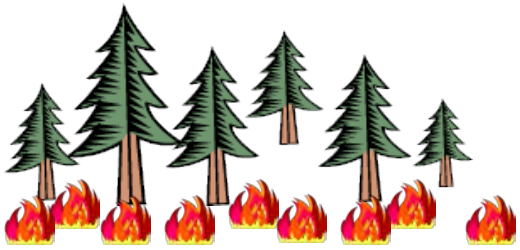
1%

The solution…

Integrated Biomass Energy Campus!

"IBEC"

Integrated campus supply chain



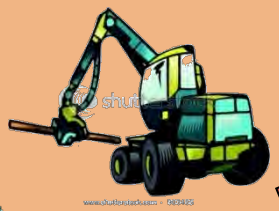
Long saw logs directly to mill

Integrated Campus

45 miles

Short Saw & Pulp

60%



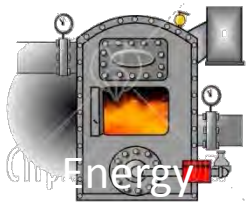
25%

Firewood/ Densified

15%

Post & pole

Residuals



Energy

Whole-tree yarding of small logs / woody biomass for shipment to integrated campus.

Integrated Biomass Energy Campus

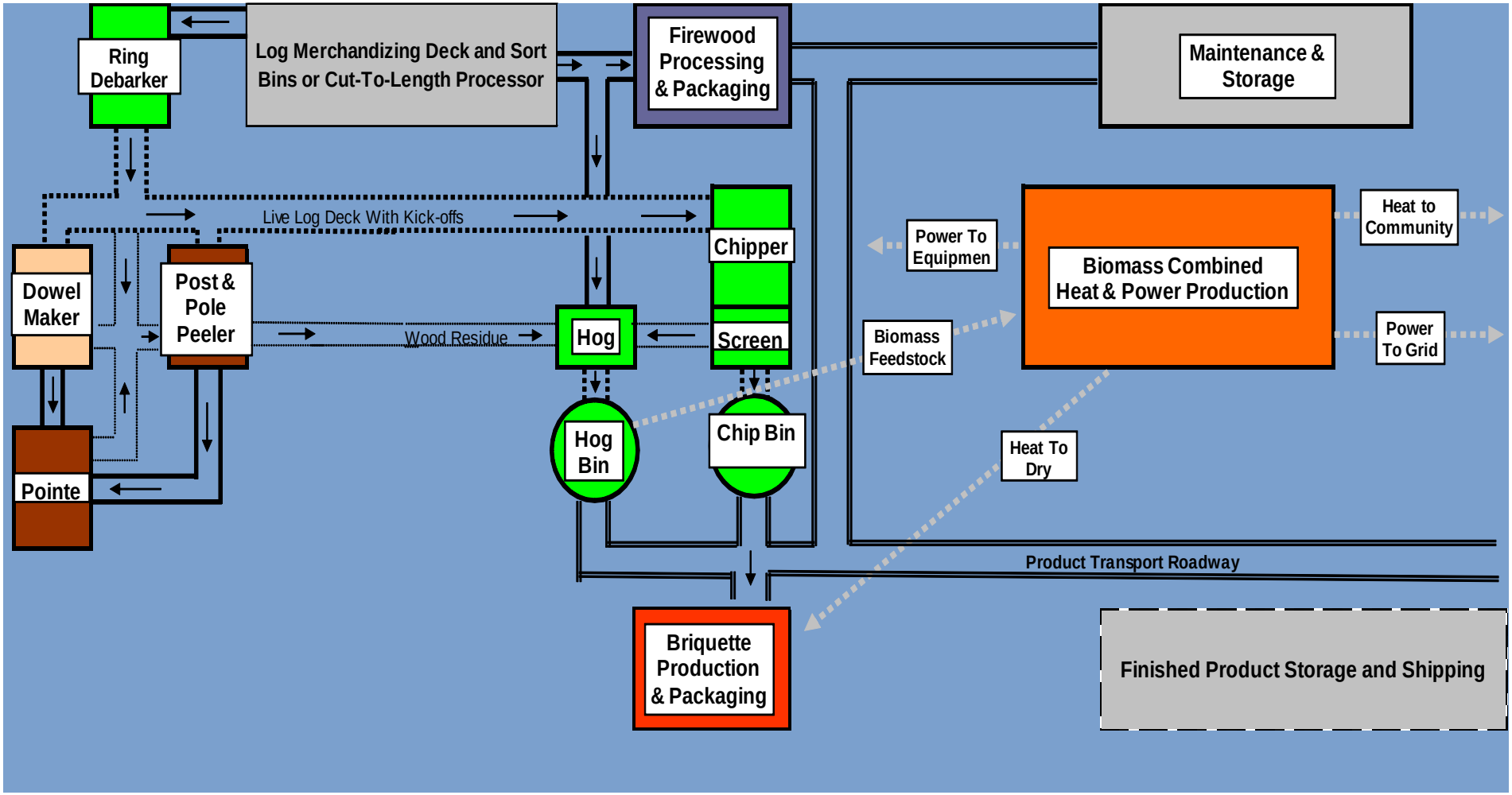


Photo courtesy of Marcus Kauffman

Monthly Boiler Revenue and Costs

Fuel Cost - $3564 (at $18/ton)

Maintenance - $350

Labor - $1350

Electricity Sales/Value - $5040

Thermal Sales - $5000

Net Revenue - $4776

Assumes limited thermal markets: potential to increase thermal sales value and net revenue with additional thermal users.

Benefit 1: Reduced in-woods harvesting and trucking costs, and lesser site impacts

- Reduced harvest cost per acre, due to simplified and reduced in-the-woods sorting and processing
- Higher recovery rate in volume of small log and biomass materials, and less breakage
- Smaller landings result in less site disturbance

Benefit 2: Integrated and diversified merchandising and marketing

- Reduced raw material cost for Campus businesses
- Operational advantages to inventory, labor sharing, and market adaptation
- Operational synergies for marketing and delivery

Benefit 3: Economic Diversity, Stability, and Predictability

- Local ownership and control
- Circulating payroll and revenue dollars
- Job creation, both on site and in the woods
- Utilization of the human and infrastructure capital, and continuation of Wallowa County's forest products heritage.

Benefit 4: Increased forest health and restoration

- Increase in acres treated for hazardous fuel reduction
- Reduced cost to tax payers associated with forest restoration
- Improved air quality, and reduced cost of weed control

Benefit 5: Additional supply to regional mills and forest products customers

- Increased tons per acre removed
- Improved harvest economics


EXIT

Photo courtesy of Marcus Kauffman

Photo courtesy of Marcus Kauffman

Photo courtesy of Marcus Kauffman

Photo courtesy of Marcus Kauffman

County-Scale Impacts

- Employment
  - 25-30 jobs on-site, 18 in the woods (>1% of the workforce)
- Catalyst to forest management
  - Markets for 100,000 - 130,000 tons of woody biomass
  - Support management costs for 10,000 to 20,000 acres
  - $3,000,000+ in delivered log / biomass payments to landowners
- Biomass energy benefits
  - 1 MW of electricity / 5 million BTU's of heat
  - Offset of 1 metric ton of carbon
  - Retain ~$500,000 in energy payments in local economy

It takes a village

- Passionate, and knowledgeable management
- Public-private partnerships
  - Financial support from US DOE, USDA, Oregon Dept. of Energy, US Endowment for Forestry and Communities Energy Trust of Oregon, Pacific Power Blue Sky, Northwest Community Capital Fund, and private investors and donors.
  - Low-cost working capital - NMTC
  - County government support
- Non-profit partnerships
  - Technical assistance
  - Maintaining the triple-bottom line
  - Equity stake

Questions?

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- Or visit Integrated Biomass Resources:
  - http://www.integratedbiomass.com/