



U.S. DEPARTMENT OF ENERGY

**Northwest Clean Energy Application Center**

*Promoting CHP, District Energy, and Waste Heat Recovery*

# **Biomass and Bioenergy: Lessons from other northwest states**

**David Sjoding**

**Northwest Clean Energy Application  
Center**

**Montana Environmental Quality Council**

**March 4, 2010**

## Initial Perspectives and comments

- The multi-state Northwest team has worked together since 1982 – It helps a lot
- Pay attention to the value of the dollar: Commodities serve as a protection against a weak dollar. The ripple effect is a much stronger drive for liquid biofuels
- Track the reform progress of the Commodity Futures and Trading Commission
- We need a strong focus on reducing forest fire danger/forest health
- Washington Bioenergy Team – Weekly meetings
- Co-products improve economics

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# Pacific Regional Biomass Energy Partnership

Alaska, Hawai'i, Idaho, Oregon, Montana, and Washington

## Washington did its own Biomass Inventory

Washington completed its inventory in 2005 –  
Dept of Ecology, Waste2Resources funded

- County Level - 44 Feedstocks at sustainable levels
- With biomass chemical characteristics
- 16.9 dry tons with about half woody biomass
- Approximately 70% above the DOE Billion Ton report
- Website

<http://www.pacificbiomass.org/WABiomassInventory.aspx>

- Reduces the cost of feedstock due diligence

# Washington Update of Biomass Inventory

## Key change is in forestry

- Looking at 19.6 million dry tons
  - Logging slash is coming out of the woods on an increasing basis (pre BCAP) – Increasing supply
  - Wood waste demands are also increasing
  - Eastern Washington Biomass Accessibility Study, Elaine Oneil, University of Washington
  - “Investment Grade” supply study of Olympic Peninsula (excluding the national forest) by Olympic Natural Resource Center – Triggered by ARRA Stimulus funds

# Stimulus Funds: Washington Woody Biomass CHP

**Wins Big!**

**4 projects – 114.4 MWc funded for \$26.25 million**

- **Requests: 9 projects, 181.4 MWc**
  - **Mostly on the Olympic Peninsula and in the Puget Sound region**
  - **An additional 95 MWc are in the works on the Olympic Peninsula**
  - **Implications:**
    - **If you own it, you control it – Long term supply**
    - **Will there be any woody biomass available for biofuels (cellulosic ethanol or drop in fuels)?**

# Washington & Stand Alone Biopower (No CHP)

## An area of state concern

- **2009 Legislature ESSB 6170 Section 2 (e) “Avoid interfering with the current working area for forest biomass collection surrounding an existing fixed location biomass energy production site.” – Dept of Natural Resources enabling legislation**
- **We have growing feedstock competition and policy competition**
- **We should use our feedstock efficiently (drying and CHP)**
- **Are we trading one set of green/rural jobs for another and lesser set?**
- **Bill Carlson’s analysis is appreciated (national expert on contract with Northwest Energy Biomass Study)**

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# Biochemistry & Waste Streams – Apre's Vin

## Beyond Waste – Every Organic Waste Stream a Revenue Stream – Dept of Ecology

- Growing grape seeds & skins wastes – “Hot” with interesting biochemistry
- Now many products: Ethanol, brandies, tartaric/tannic acid recovery, grape seed oil, press cake, spent yeast as high protein, balsamic vinegar etc.
- We need many “George Washington Carver” biochemists

[http://www.pacificbiomass.org/documents/BeyondWaste\\_Winecycling\\_Leber.pdf](http://www.pacificbiomass.org/documents/BeyondWaste_Winecycling_Leber.pdf)

- Borgford Bioenergy – Re-starting the forest products industry – 7 products: Specialty beams, biochar
- Mini-biorefineries

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# Oregon Economic Development – Rough & Ready Lumber

## An amazing set of state incentives & actions

- A 1.28 MWc CHP project using mill waste with funding support from: 1) Energy Trust - \$1,700,000); 2) USDA - \$500,000 grant and \$2,350,000 loan; and 3) OR Dept of Energy - \$1,250,000 business energy tax credit
- Working to preserve the Oregon forest products industry
- Oregon PUC – Distributed Generation in Oregon: Overview, Regulatory Barriers and Recommendations with strong implementation  
[http://chpcenternw.org/NwChpDocs/DistGenInOregon\\_Overview\\_RegBarriers\\_Reccomendations.pdf](http://chpcenternw.org/NwChpDocs/DistGenInOregon_Overview_RegBarriers_Reccomendations.pdf)
- Don't over due the incentives – BETC story

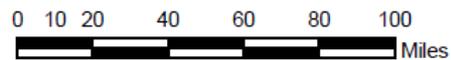
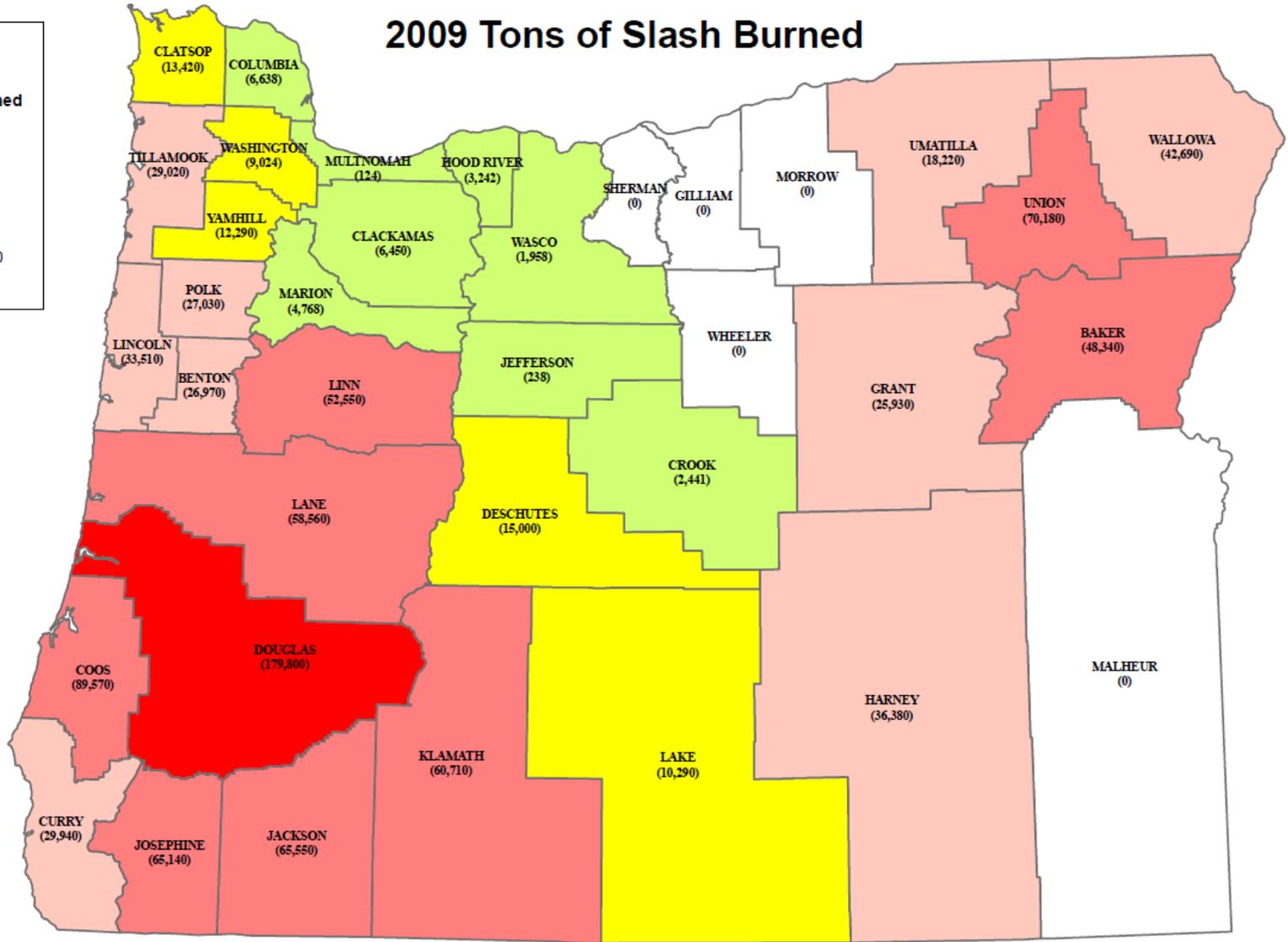
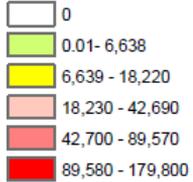
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# 2009 Tons of Slash Burned

## Legend

### Tons of Slash Burned



# Washington Woody Biomass Studies/Research

**A number of studies have been done or are underway**

- EPA Region 10, WA Dept of Ecology ORCAA study: Air Quality & Climate Implications of Options for Woody Biomass - Life cycle assessment and a range of fates
- Wood to Energy in Washington, Univ. of Washington, 2009
- Washington State Pulp and Paper Mill Boilers, Univ. of Washington, 2009
- Dept of Ecology – Beyond Waste Strategy – 8 studies
  - Topics include steam explosion, pyrolysis emissions, biorefinery designs, biochar, solids digesters, pretreatment & economics

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# Moisture – The target

- Major efficiency gains to reduce moisture content of the fuel
- Biomass Drying and Dewatering for Clean Heat and Power

<http://www.chpcenternw.org/NwChpDocs/BiomassDryingAndDewateringForCleanHeatAndPower.pdf>



## **Bioenergy Policy choices**

**Which policy tectonic plate will win? Do we maximize:**

- **Biofuel production – 36 BGY? – Get out of middle east**
- **Biopower production – Renewable electricity standards**
- **Pellets and torrefaction cubes for Asia and Europe – Kyoto**
- **Biochar – Carbon negative and healthy soils**
- **Maximize rural economic development – Which end use yields the most rural jobs, And, who owns?**
- **Or, are we trading one set of green jobs for another? – The forest products/pulp & paper industry can be helped or hurt**
- **Sustainability is an overriding key value – Right?**
- **What about compost and beauty bark?**

# MONTANA OBSERVATIONS

## Focused attention needed

- Certified Industrial Energy Efficiency Specialists are lacking – Steam, process heating, pumping systems, compressed air, fans, and CHP expertise – A Northwest collaboration – See [http://chpcenternw.org/NwChpDocs/Industrial\\_Energy\\_Efficiency\\_and\\_CHP\\_Qualified\\_Specialists.pdf](http://chpcenternw.org/NwChpDocs/Industrial_Energy_Efficiency_and_CHP_Qualified_Specialists.pdf)
- Biomass CHP and the utilities – A very smooth working relationship with a strong policy framework helps
- The interconnection scorecard – Freeing the Grid 2009 <http://irecusa.org/>

# ENERGY EFFICIENCY STANDARDS

## Several states require energy efficiency programs

- **WA – Voter Initiative 937 – Cost effective conservation targets over a 10 year period**
- **OR – Systems Benefit Charge – Energy Trust of Oregon**
- **Why? Stretching our lower cost power as far as possible**
- **Northwest Power & Conservation Council – 6<sup>th</sup> plan is now complete**

<http://www.nwcouncil.org/energy/powerplan/6/default.htm>

- **The interstate compact priorities are:**
  - **Energy efficiency**
  - **Renewable energy**
  - **CHP/Cogeneration**
  - **Standalone baseload power**

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**Pacific Region – A six state-based team of AK, HI, ID, MT, OR & WA [www.pacificbiomass.org](http://www.pacificbiomass.org)**

**\$Over 100 Million in biennial state funds**

**Functions as a team since 1982**

**Taken together: A “Complete Program” –  
Near, mid and long term research;  
development; demonstration; deployment;  
policy analysis & legislation; information;  
outreach**

**Strong ties to USDA.**

# Northwest Clean Energy Application Center

## About the Center

- A multi-state effort – AK, ID, MT, OR, & WA
- WSU Extension Energy Program serves as lead
- 100 plus Regional CHP projects totaling over 1,300 MWc
- District energy & waste heat recovery also included
- 94% industrial projects
- Technical assistance information, reports and case studies
- Problem solving & trouble shooting
- Website [www.chpcenternw.org](http://www.chpcenternw.org)
- Support of regional & state CHP initiatives

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