



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**

Alaska • Idaho • Montana • Oregon • Washington





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, Waste 2 Resources 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 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)**

Alaska • Idaho • Montana • Oregon • Washington



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_Wine_cycling_Leber.pdf
- Borgford Bioenergy – Re-starting the forest products industry
– 7 products: Specialty beams, biochar, 9.4 MW
- Mini-biorefineries

Alaska • Idaho • Montana • Oregon • Washington



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

- Don't over due the incentives – BETC story

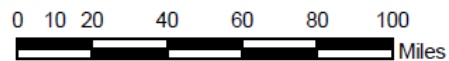
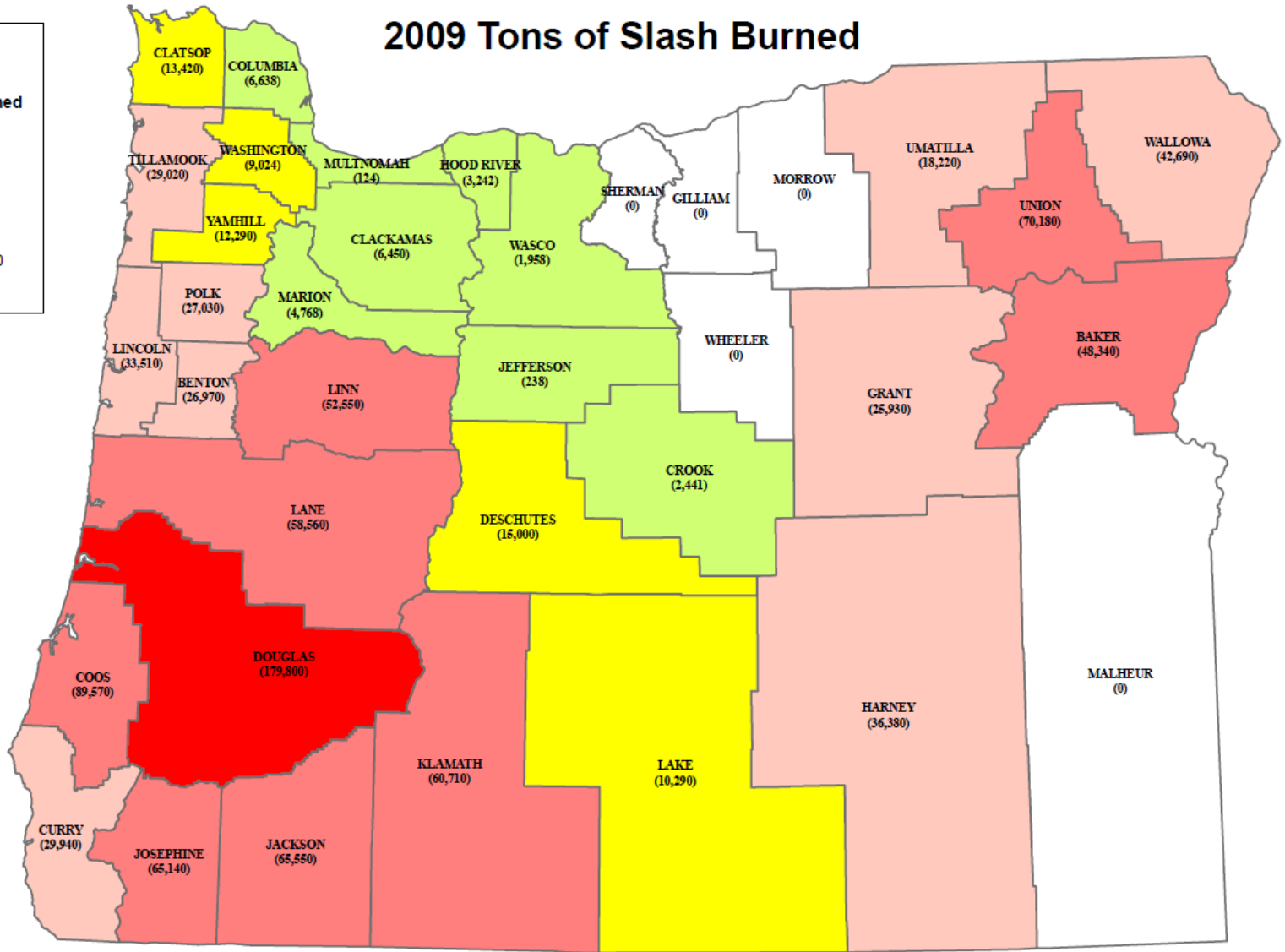
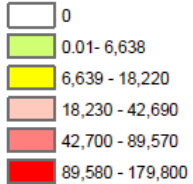
Alaska • Idaho • Montana • Oregon • Washington



2009 Tons of Slash Burned

Legend

Tons of Slash Burned



LOW COST POWER & PROJECT DEVELOPMENT

The creative solutions of the states are in high gear

- Compare costs to future power plants not existing rates – Integrated Resource Planning, Especially as BPA power is limited
- Tax incentives & Grant shopping – Especially USDA Rural Development
- CHP wheeling to utilities in need
- ARRA stimulus funds (State Energy Program) for equipment
- Renewable Electricity Standards
- CHP can also fit under Electricity Efficiency Standards
- Have a supporting CHP/utility regulatory policy framework
- Have utility facilities co-locate with needs for steam
- Co-product development to improve economics

Alaska • Idaho • Montana • Oregon • Washington



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, high solids digesters, pretreatment & economics**

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>



Pacific Regional Biomass Energy Partnership

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

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 – 6th 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**

Alaska • Idaho • Montana • Oregon • Washington





Pacific Region – A six state-based team of AK, HI, ID, MT, OR & WA 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**
- **Support of regional & state CHP initiatives**

Alaska • Idaho • Montana • Oregon • Washington

