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
Washington did its **own** Biomass Inventory


- 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)
Biochemistry & Waste Streams – Apre’s Vin


• 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


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