Northwest CHP Application Center

Combined Heat and Power for the states of
Alaska, Idaho, Montana, Oregon and Washington
in cooperation with the U.S. Department of Energy

Northwest CHP Application Center:

Local CHP Opportunities & Resources

CHP Workshop for Puget Sound Energy

Date: June 5, 2009

Dave Sjoding

PRESENTATION TOPICS

- **Information about the center**
- **Windows into CHP – CHP and…**
- **Washington 09 Legislative Action**
- **A Deeper Look at specific projects**
- **What is on the horizon**

Changing Language

- **Cogeneration – Older language often embedded in law**
- **CHP – Combined Heat and Power with variations like CCHP adds cooling**
- **CHP – Clean Heat and Power – Recent years**
- **Biopower – Most often but not always CHP**
  - **Non CHP examples - LFG and Avista Kettle Falls**
- **Renewable CHP**
- **CHHP – Adds hydrogen**
- **Biomass to Bioenergy – Shift began about 1990**

CENTER GOALS

Major Goal – Increase CHP power production in the Northwest in concert with the national CHP roadmap

Objectives

- **Support establishing a CHP policy framework through education**
- **Provide technical assistance and trouble shooting on CHP projects**
- **Develop information, education, outreach and software tools**
- **Catalyze state and regional funding and staffing support for CHP**

Northwest CHP Applications Center

About the Center

- A multi-state effort – AK, ID, MT, OR, & WA
  - WSU Extension Energy Program serves as lead
  - 109 Regional CHP projects totaling 1,301 MWc
  - 94% industrial projects
  - Technical assistance information, reports and case studies
  - Problem solving & trouble shooting
  - Website www.chpcenternw.org
  - Support of regional & state CHP initiatives

Funding – From federal fiscal year provided

- 2009 - $50,000 (for 10 operations)
- 2007 - $165,000 (for 08 & 09 operations)

CENTER STRUCTURE

Washington State University Extension Energy Program – Prime leader

In partnership with active and funded state energy agencies

Alaska – Alaska Energy Authority
Idaho – Office of Energy Resources
Montana – Department of Environmental Quality
Oregon – Department of Energy (No funding)
Cascade Power

PARTNERSHIP STRENGTHS

WSU – Strategic direction and management; Software (RealCost, HeatMap/CHP); Waste heat to power, District energy/CHP; and Biopower/Fuel Cells

AK – Remote microgrid CHP with high penetration renewables

ID – Engineering

MT – Environmental

OR – Policy framework

STRUCTURE STRENGTHS

- **Website – Lots of Information in the library: Case studies, reports, factsheets, and guidebooks – www.chpcenternw.org**
- **In-state staffing and presence**
- **Team expertise sharing**
- **Funding for CHP**
- **Policy and initiative support**

CHP projects list

A state by state tracking of CHP projects on-line since 2004, under construction or in various stages of permitting, financing, design, and up-front analysis

State	Number of CHP Projects	Known MW Increases
Alaska	31	.875
Idaho	15	60.67
Montana	22	108.161
Oregon	15	250.415
Washington	26	880.881
Totals	109	1,301.002

CHP and I-937

The voter initiative handles CHP as both energy efficiency and as Renewable CHP – Warning, meticulous reading

<u>Efficiency measure</u> – CHP can be an efficiency measure if a third of total energy is for thermal use and for a facilities' own needs. (Neither electricity nor thermal energy can be shared with a neighbor for this calculation.) [Section 4(1)(c)]. The high efficiency language came from the Oregon Energy Facility Siting Council's definition. Qualifying utilities (above 25,000 customers) can help fund a portion of this kind of project up to the limits of "being cost-effective, reliable and feasible." [Section 4 (1)]

CHP and I-937

) <u>Renewable CHP</u> – Renewable CHP is subject to the definition in Section 3(18) and would include: 1) Sewage treatment facilities (assumes they use the waste heat in the digester and/or for buildings); 2) Anaerobic digestion from manure; and, 3) Burning wood waste/hog fuel, if not from old growth forests or treated with chemical preservatives. Neither burning black liquor in paper making nor burning municipal solid waste qualifies as renewable. In addition, if a project is not more than 5 MW capacity, and the utility owns, contracts for the power produced, or buys the renewable energy credits (in all cases the power must come from the Pacific Northwest or arrive on a real-time basis—unshaped or integrated), then it gets double credit for the standards.

CHP and Natural Gas

It's back! – Price is way down and more stable

- In 2008 the U.S stopped importing natural gas including from the Middle East – LNG terminals now want to export
- Fractionated horizontal drilling in natural gas bearing tight sands and shales – Fully commercial technology
- OR has 4 proposed pipeline from the Rockies and several proposed LNG terminals
- CHP and natural gas – Recent history in Northwest
- For the first time in 4-5 years I'm starting to see natural gas based CHP

CHP and the Northwest Power and Conservation Council

It's the 3rd priority after energy efficiency and renewables – Just above standalone power generation – Federal law

- **The 5th Power Plan began to include CHP in the plan but not in the Action Plan.**
- **Hmm. How can you ignore 1.3 GW of power potential, especially with the return of cheaper gas?**
- **The draft of the 6th Power Plan emerges in July. How will it handle CHP?**
- **Note: BPA in its recent RFI included CHP**

CHP and Wheeling

We have CHP wheeling in the Northwest

- **Sierra Pacific, Burlington, WA – 28 MW to Sacramento, CA – Enabled by SCL**
- **Simpson Tacoma Kraft – 60 MWc to CA enabled by Iberdrola Renewables (1000 MW of transmission to CA) – Impacts price of renewables**
- **The Monroe dairy digester – 450 kW from SnoPUD to PSE**
- **The Energy Efficiency/Green Buildings Climate Action Team called for CHP wheeling to neighboring utilities. The Monroe digester was the cause celeb**
- **WA utilities are a checkerboard of attitudes toward CHP, And yes, the attitudes are tracked**

CHP and Transmission/distribution

It can and does make a difference

- **CT and FERC transmission surcharge requirements – The sudden discover of CHP – Lots of CHP installations**
- **Hampton Mill, Darrington, WA – 7.5 MWc – Takes pressure off of a rapidly growing county with significantly increasing power demands – Buy all/Take all contract**
- **Requires internal utility cross-talk between supply and transmission/distribution**
- **If there are cross-talk restrictions, CHP can be a causality**
- **BPA and Non-wires: The priority order is efficiency, local renewables and CHP, then transmission**
- **BPA's southwest OR example**

CHP and Climate change

CHP is one of the pathways for industrial greenhouse gas reductions

- **Did Washington have an Industrial Climate Action Team Workgroup? - No**
- **Reduction can be taken as an off-set or a direct reduction**
- **The key is in the fuel mix of the power and how it is treated**
- **Q: Marginal or average? A: Makes a huge difference in the northwest - Marginal**
- **See Northwest Power and Conservation Council study: Marginal Carbon Dioxide Production Rates of the Northwest Power System June 2008**

http://www.nwcouncil.org/library/2008/2008-05.htm

CHP and Interconnection

A national area of frustration for project developers

- **A dairy in eastern Washington: A story well known in the dairy community**
- **Nationally it surfaced in the EPAC 2005 federal legislation**
- **Resulted in a call for legislated procedural timelines and quality behavior**
- **USDA REAP funds can help co-fund in rural areas – NOSA (grant application) is due 7/31/09**

2009 Legislative Session

What happened?
Number of new laws relating to CHP: 9

ESSB 6170 extends and expands tax reduction incentives as follows:

a) Sales and Use tax refunds for purchase of machinery and equipment used directly in generating electricity from biomass energy, lost energy from exhaust, anaerobic digestion, fuel cells, geothermal and landfill gas. Expires 7/1/13

b) Sales and Use tax exemptions for hog fuel and forest derived biomass to produced electricity, steam, heat or biofuel. Expires 6/30/13

c) Business & Occupation tax credit for harvest of forest derived biomass used for production of electricity , steam, heat, or biofuel. Declining credit through 6/30/15

2009 Legislation Continued - Funding

- **The state's biennial appropriation bill (HB 2289, section 5) provides $38.5 million of ARRA recovery funds from the State Energy Program for loans, loan guarantees and grants for energy efficiency and renewable energy projects or programs CHP should compete well in this setting;**
- **ESSSB 5649 provides guidance on the use of ARRA recovery funds including $500,000 to develop farm energy assessments. The funding supports software development for online assessments including energy, fertilizer, fuels, and carbon emission reductions. Dairies will be the first agricultural sector developed with a strong anaerobic digestion/CHP focus.**

2009 Legislation Continued

- **SSB 5921 establishes a Clean Energy Leadership Council to guide development of the clean energy economy and advise on stimulus funding use**
- **ESSHB 1007 establishes a sustainable energy trust in the Housing Finance Commission for renewable energy and energy efficiency for residential, commercial, agricultural, state and municipal property;**
- **SSB 5797 provides a solid waste permit exemption for co-digestion of pre-consumer food waste and dairy manure. This legislation supported by the Governor removes a regulatory barrier for dairy anaerobic digestion/CHP systems. 18% food waste increases dairy biogas production and power generation by 63%. This starkly improves the economics of these systems. - Potential: 135 Dairies**

2009 Legislation Continued

- **SSB 5724 empowers counties with Public Utility Districts to own and operate a facility that generates electricity from biomass energy. This bill enables a 20 MW CHP system in Clark County; and**
- **HB 2165 allows the Department of Natural Resources to develop two biomass energy demonstration projects using forest biomass. We are looking for two CHP projects from this legislation.**

What didn't happen: 2009 Legislative Session

- Climate change cap & trade legislation – The Western Climate Initiative continues with 49% carbon off-sets versus RGGI at 3.3%
- Amending I-937 (from tweaks to major changes)
- However,
- HB 2129 Updates the greenhouse gas emissions standard
  - Unspecified sources limited to 12% (whether inside or outside the state
  - Extraordinary cost impacts exception for IOUs
- Executive Order 09-05 – Washington's leadership on Climate Change – Industrial focus, Continue with WCI

A deeper look: Specific CHP Projects

Learning from examples – BP Cherry Point

- 738 MWc at full build out
- Fully permitted and designed
- Project halted when natural gas prices become unstable and volatile
- Transmission to CA was also a problem
- Now the setting for natural gas prices is very different
- Transmission north to BC and across to AB an option
- See PNWER study by INL: The Cost of Not Building Transmission (did not address CHP)

http://www.pnwersenergyhorizon.com/files/PNWERReport_Rev2c_Final_16Jul08_9jmu05.pdf

A Deeper Look: Specific CHP Projects

CHHP: Renton Molten Carbonate Fuel Cell

- The Renton WWTF project is currently mothballed
- DOE has targeted CHHP for further development
- Fuel Cell Energy was in town this week
- The interconnection agreement with PSE would have to be reworked
- The fuel cell stacks are due to be replaced and have a longer life
- About 23% of the tailgas is hydrogen
- Gas separation technologies have been steadily advancing
- The Eka Chlor-Alkali plant in Moses Lake is also of interest

A Deeper Look: Specific CHP Projects

Adage: 50 MW biopower plants

- Standalone biopower or CHP?
- Forest waste and hog fuel are increasing in value
- For the first time logging slash has been coming out of the woods – Legislation solved the tax question
- Reliable fuel supply is a key
- Transportation costs can economically kill a project
- The Forest Resources Association is an important player with expert knowledge: Contact Tim Gammell, Western Region Manager, Forest Resources Association,1825 Leslie Road, #136 Richland, Washington 99352; Phone: 509.396.2478

What's coming?

- **Re-emergence of natural gas CHP**
- **Waste Heat Recovery – EPAC 2005 and the EPA shopping list**
- **CHP and Climate Change at the Federal Level**
- **Washington Stimulus Funds - $38/5 million, Contact Dept of commerce (Was CTED) See State energy Program at http://www.recovery.wa.gov/programcontacts.asp#energy**
- **Northwest Clean Energy Application Center per EPAC 2005**

Contact information

Dave Sjoding
Pacific Regional Biomass Energy Partnership Team Leader
www.pacificbiomass.org
Northwest CHP Application Center Team Leader
www.chpcenternw.org
WSU Extension Energy Program
905 Plum St. SE, Bldg 3
P.O. Box 43165
Olympia, WA 98504-3165
Phone: 360.956.2004
Fax: 360.236.2004
E-mail: sjodingd@energy.wsu.edu