Northwest Power and Conservation Council

February 23, 2009

MEMORANDUM

TO: Council Members

FROM: Terry Morlan

SUBJECT: Report on Status of Sixth Power Plan Development

Staff has nearly completed its first round forecasts and assumptions for the draft plan. We have begun to analyze the implications of those assumptions for a least cost and low risk portfolio of power resources. In addition we have begun writing drafts of parts of the Power Plan. The Council has already seen drafts of Chapters 3 and 4 and parts of Chapter 5. Included in this packet is a complete draft of Chapter 5, which describes the important assumptions and forecasts underlying the Power Plan.

I will brief the Council on the status of writing for the overall Power Plan in the context of the plan outline. I will also describe in summary form the contents of Chapter 5. The preliminary draft of Chapter 5 is intended to summarize the forecasts and assumptions that the Council has been briefed on at various meetings over the last several months. Putting these plan assumptions into writing will give the Council an early opportunity to comment on the approach, level of detail, and presentation of the material. The preliminary draft of Chapter 5 itself will not be posted on the website or handed out to the public at this point.

A copy of the PowerPoint presentation that I plan to use for this agenda item is attached.

Attachments

851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204-1348
www.nwcouncil.org

Steve Crow
Executive Director

503-222-5161
800-452-5161
Fax: 503-820-2370

Status Report on Power Plan Development

Council Meeting
Boise, ID
March 10-11, 2009

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Overall Writing Status

I. Executive Summary

II. Implementation plan

III. Introduction

A. Purpose of the Power Plan

B. Important Issues

IV. Background

A. Loads and Resources

B. Trends in Energy Costs

C. Evolving policies and electricity markets

D. The carbon footprint of the NW power system?

E. Past Council's Plans

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

V. Assumptions and Forecasts

- *A. Basic financial assumptions*
- *B. Forecasts*
- *C. Resource assumptions*

VI. Long-term resource strategy

- *A. Developing a resource strategy*
- *B. A resource strategy for the region*
- *C. Interpreting the strategy as a resource plan*

VII. Climate Change Issues

- *A. Background*
- *B. Information on GHG sources in the region*
- *C. Policy initiatives affecting the region*
- *D. Meeting emission reduction goals*
- *E. Policy alternatives*
- *F. Least cost plan for meeting goals*

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

VII. Capacity and Flexibility Resources

- *A. Operating a reliable power system*
- *B. The Northwest Power System*
- *C. Potential solutions to address flexibility and capacity needs*
- *D. Recommendations, short and long-term*

VIII. The Bonneville Administrator's Loads

- *A. Bonneville's changing role*
- *B. Bonneville Administrator's requirements*
- *C. Consistency with the Power Plan*

IX. Regional adequacy standards

- *A. Purpose of adequacy standards*
- *B. Role in the power plan*
- *C. Power Plan's role in the standards (economic)*

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Appendices

A. Fuel Price Forecast

B. Economic Forecast

C. Demand Forecast

D. Wholesale and Retail Electricity Price Forecast

E. Conservation

F. Demand response

G. Model conservation standards

H. MCS cost effectiveness for residences

I. Smart grid and new approaches to efficiency acquisition

J. Generating Resources

K. Global climate change issues

L. Descriptions of models and analysis

M. Fish and Wildlife interactions

N. Data summaries (or included in each appendix)

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Strategy on Appendices

- Reasoning:
  - Limited number read the appendices
  - Most requests are for underlying data
  - Appendices are only published on website
- Proposal:
  - Describe methods of analysis, data sources
  - Describe data files containing information
  - Provide links to usable data files (e.g. Excel)

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Outline of Draft Chapter 5

- Financial assumptions
- Forecasts
  - Economic growth
  - Fuel prices
  - Demand for electricity
  - Electricity prices: wholesale and retail
- Resource assumptions
  - Conservation
  - Demand response
  - Generation
    - Hydro and F&W
    - Fossil
    - Renewables
- Direct use of natural gas
- Transmission assumptions

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Economic Growth

- Economic growth is projected to be slower both for the nation and the region
- The region's population and employment are still expected to grow faster than the nation, but the difference is smaller than in the past
- The mix of economic activity is changing and affects the demand for electricity

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Fuel Price Forecasts

- Fuel prices are expected to moderate for a few years, but long-term are higher than previous plan forecasts
- Forecast ranges are wider reflecting greater uncertainty about future fuel prices
- Natural gas and oil prices are expected to remain volatile
- Uncertainty and volatility will be reflected in portfolio analysis

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Demand for Electricity

- Demand is projected to grow at 1.6 percent per year, or by about 380 MWa per year
- Conservation achieved and revised electricity prices will reduce that growth rate
- Growth is largely in the commercial and residential sectors
- Peak loads are expected to grow faster than energy, especially summer peaks

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Electricity Prices

- Wholesale prices grow from $45/MWh in 2010 to $85/MWh in 2030 (2006$)
- Wholesale prices are sensitive to natural gas and coal prices, CO2 penalty, and RPS
  - CO2 penalty grows to average of $47/ton with significant uncertainty addressed in RPM, also sensitivity cases in Aurora
- Retail price forecast is still preliminary: will change with wholesale price, conservation costs and savings, RPS costs

NORTHWEST 6th POWER PLAN

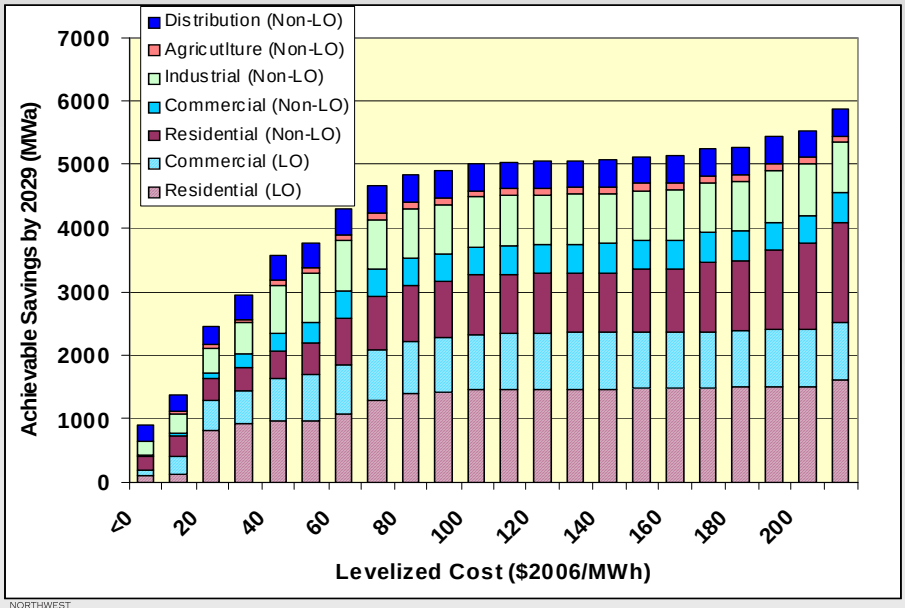
Northwest Power and Conservation Council

Conservation Potential

- Potential reduced by achievements since last plan, increased by technology advances and assessment of some new sectors
- Cost-effectiveness will be determined in portfolio model analysis
- Achievable technical potential is about 10 percent higher than the 5th Plan
  - Residential and commercial sectors hold three quarters of the potential
  - Increased potential in industrial (800 MWa) and CVR (400 MWa)

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council



NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Demand Response

- 2,900 MW of potential included in analysis
- 7 separate categories
  - Direct control A/C - 200
  - Irrigation - 200
  - Direct control SH/WH - 200
  - Commercial aggregators - 300
  - Interruptible contracts - 600
  - Demand buyback - 400
  - Dispatchable standby generation - 1000

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Hydroelectric Generation

- Assume Biological Opinion mainstem actions
- Assume loss of 450 MWa of energy capability over the planning period
- Variability reflected in 70 water years simulation (1929-1998)
- Peak capacity based on new Bonneville/Council study,

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Generating Resources

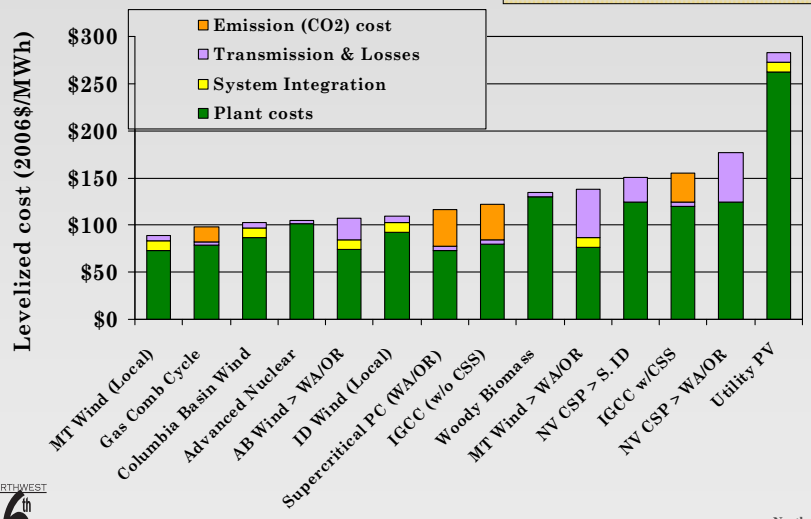
- We have assessed technologies and costs for most major generating resources
- Near-term potential mostly natural gas, Columbia Basin wind, and small dispersed renewable opportunities
- Resources not available near-term include coal gasification with sequestration, nuclear, and some renewables that are either too expensive or are immature technologies

NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Energy Resource Options Early 2020s

Transmission cost & losses to point of LSE wholesale delivery
No federal investment or production tax credits
Baseload operation (CC, Nuc, SCPC 85%; IGCC, Bio - 80%)
Medium NG and coal price forecast (Draft 6th Plan)
Proposed Draft 6th Plan CO2 price.

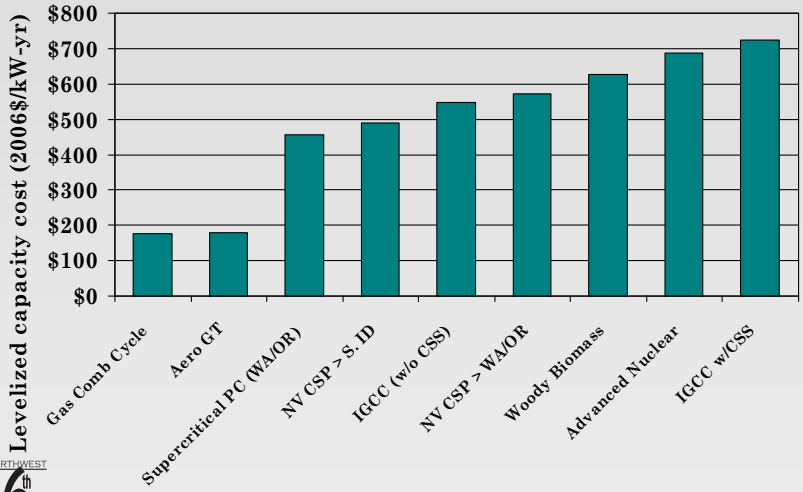


NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council

Supply-side Capacity Options Early 2020s

No federal investment or production tax credits
Medium NG and coal price forecast (Draft 6th Plan)



NORTHWEST 6th POWER PLAN

Northwest Power and Conservation Council