

Bruce A. Measure
Chair
Montana

Rhonda Whiting
Montana

W. Bill Booth
Idaho

James A. Yost
Idaho



Joan M. Dukes
Vice-Chair
Oregon

Bill Bradbury
Oregon

Tom Karier
Washington

Phil Rockefeller
Washington

September 1, 2011

MEMORANDUM

TO: Council Members

FROM: Wally Gibson

SUBJECT: Transmission Planning Review Items

There are two items on the agenda relating to transmission planning. The staff will present a review of the draft west-wide 10-Year Transmission Plan that the Western Electricity Coordinating Council (WECC) has recently finished. That will be followed by presentations on transmission planning work by the two Northwest organizations, ColumbiaGrid and Northern Tier Transmission Group (NTTG). In this context, they are called “subregional” planning groups, where WECC is the “region” of reference.

Transmission planning occurs at multiple levels, directly by utility transmission providers and merchant developers, with coordination efforts through subregional planning groups, like ColumbiaGrid and NTTG, and west-wide through WECC. The coordination efforts of transmission providers are required by FERC Order 890. The WECC 10-Year Plan is a high-level examination of the bulk transmission that might be required by development of resources to meet state and provincial renewable portfolio standards (RPS) in 2020. The WECC plan assumes and builds on the construction of a set of transmission lines (the “foundational projects”) that are currently under development and are estimated by the transmission providers, working through the subregional planning groups, to have a high likelihood of completion.

Jeff Miller, Planning Vice-President of ColumbiaGrid, and Rich Bayless, a consultant with NTTG, will review the planning work of their organizations, which developed the projects in the foundational projects list among other planning studies. ColumbiaGrid’s membership is focused on the west side of the Northwest, including Bonneville and a number of publicly owned utilities; NTTG’s membership is focused on the east side and is predominantly made up of IOUs.

Review of WECC Draft 10-Year Transmission Plan

Wally Gibson
NW Power and Conservation Council
September 13, 2011



Overview

- Background
- What questions were asked of the analysis?
- What questions were not asked of the analysis?
- Study definition
- How were the studies done?
 - Production cost modeling and its limitations
- Plan observations and recommendations
- Reliability analysis
- Environmental analysis
- Staff observations

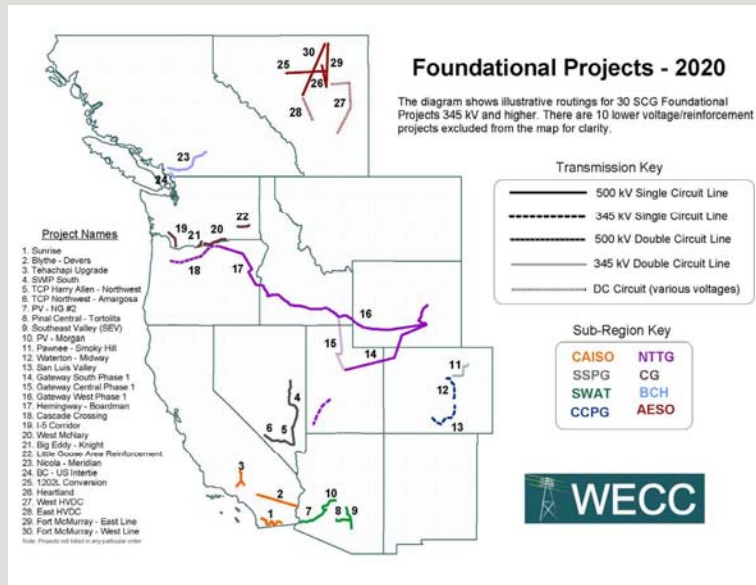


Background

- DOE grant to Western Electricity Coordinating Council (WECC), states and NGOs to expand transmission planning
 - WECC has no funding, construction or siting authority
- Plan details driven by study requests under FERC Order 890 regional planning requirements in transmission tariff
 - Requests from developers, states, subregional planning groups (e.g., ColumbiaGrid, NTTG)
 - Organized into a study program by WECC Transmission Expansion Planning Policy Committee (TEPPC)
- Studies assumed the construction of Foundational Projects (those expected by transmission providers to be completed)
 - Forty-four projects, 5,500 miles of transmission

September 13, 2011

3



• Source: WECC 10-Year Plan Draft

September 13, 2011

4



What Questions Were Asked of the Analysis?

- What transmission is needed to meet RPS requirements?
 - Will the Foundational Projects suffice or are others needed?
- What transmission would be needed if the renewables locations were different?
 - Would different renewable locations be cheaper than the expected locations, even with more transmission?
- What effects on system dispatch would the renewables have?
- Are there high-level indications the new transmission will or will not provide a reliable system?

September 13, 2011

5



What Questions Were Not Asked or Could Not be Asked of the Analysis?

- Can the within-hour operation of renewables in high penetration scenarios be accommodated? At what cost?
- Will system reliability with the new transmission be demonstrated to NERC-standard levels?
- Are the Foundational Projects the most appropriate ones to construct?

September 13, 2011

6



Study Definition

- Generation location drives transmission need
- Base cases – heavily in-state California RPS (current approach)
 - Resource locations estimated using model designed for state regulators and with input from states
 - Alternatives with 12,000 GWh (~ 1,370 MWa) renewables moved from California to 8 other locations in West
 - Added transmission to deliver using proposed projects
- Several other cases with approximately double amounts of renewables in Montana and Wyoming
- Several other cases with overall reduced loads (high energy efficiency and demand side resources) and increased loads

September 13, 2011

7



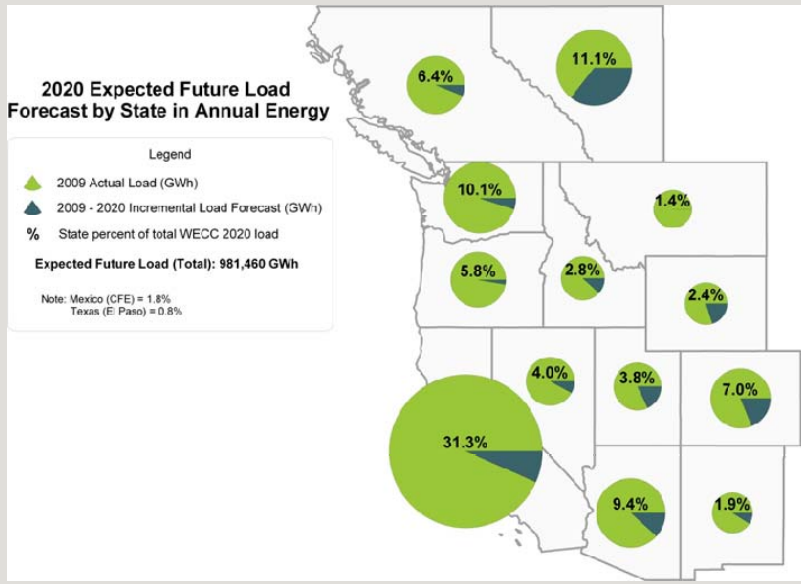
How Were the Studies Done?

- Production Cost Model – Promod
 - Full high voltage transmission network representation
 - Hourly dispatch of generation subject to transmission limits
- Strengths
 - Models physical generation and transmission system
 - Captures transmission constraints and power flows well
 - Shows best possible dispatch given operating costs
- Limitations
 - One owner dispatch – no representation of commercial limitations on transmission use (no transmission rights)
 - Important to interpreting renewables effects

September 13, 2011

8

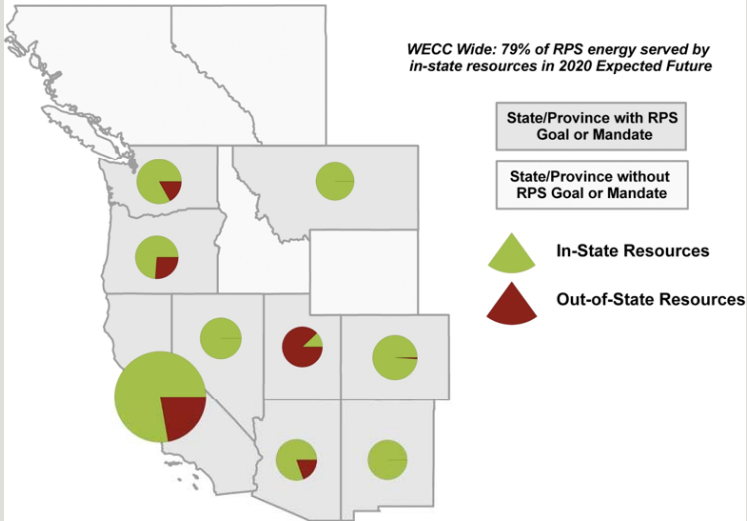




• Source: WECC 10-Year Plan Draft



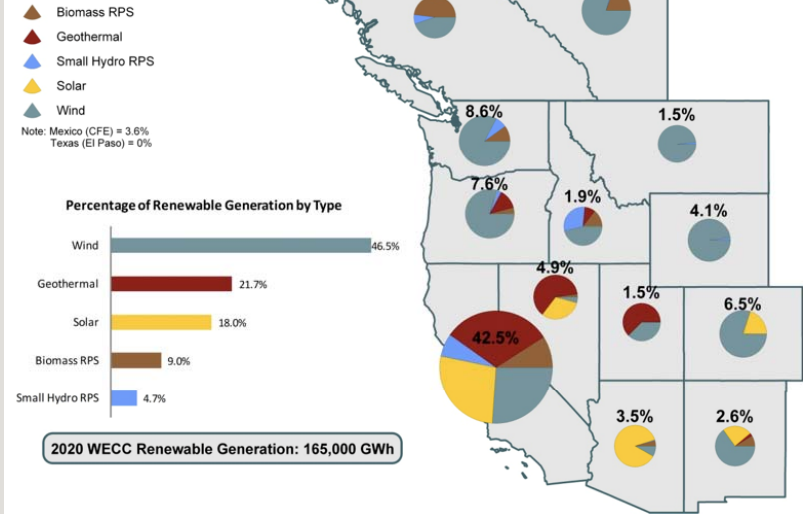
RPS Compliance Using In and Out of State/Province Resources (by Energy)



• Source: WECC 10-Year Plan Draft



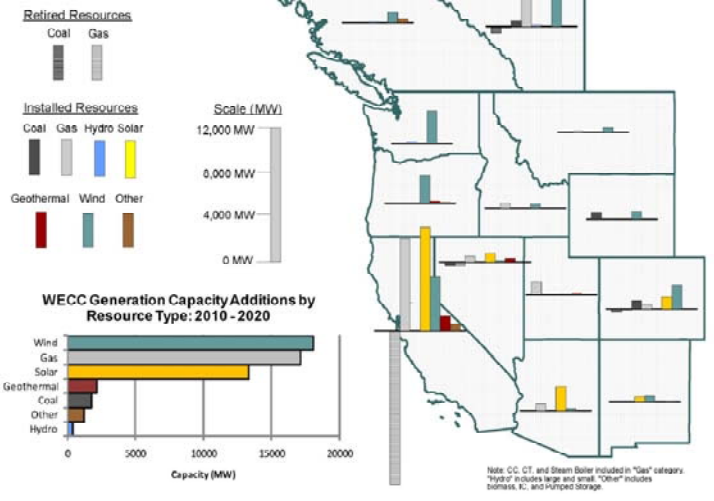
Percentage of 2020 Total Renewable Energy Generation by Type and State/Province



• Source: WECC 10-Year Plan Draft



Generation Capacity Additions and Retirements by State 2010-2020



• Source: WECC 10-Year Plan Draft



Plan's Observations and Recommendations

- Generally, the Foundational Projects, if completed, would be sufficient to transmit generation to meet 2020 RPS requirements
- Montana to Northwest (Path 8) : Could need further expansion depending on additional resource development
- Pacific Interties (Paths 65 and 66): Utilization continues to increase under most conditions that were analyzed; upgrades may be warranted
- Several regional projects coupled with renewable location changes (particularly to Montana and Wyoming wind) offer possibility of cheaper RPS compliance for California

September 13, 2011

13



Plan's Process Recommendations

- Future plans should include a comprehensive review of variable generation within-hour integration issues
- Western decision makers should look to increased regional cooperation in resource and transmission development
- Future plans should better incorporate the environmental and cultural data developed in the current planning process
- Future plans should incorporate information developed by the Western Governors' Association on water availability limitations on resource and transmission development
- Future plans should incorporate various analytical improvements, including identifying long-term Available Transmission Capacity (ATC)

September 13, 2011

14



Reliability Analysis

- Agreement with DOE required evaluation of reliability implications of plan – screening level analysis
 - Full reliability analysis would be done in WECC rating process during individual project development
- Analysis process was more difficult than expected and reliability problems that showed up were not credible
- More work will be needed in next plan development

September 13, 2011

15



Environmental Analysis

- Task force developed environmental and land-use impact data to support planning and siting
 - Mostly relevant to local planning and siting rather than regional planning, due to granularity of environmental impacts
- Particular attention paid to developing data on water use for generation

September 13, 2011

16



Staff Observations on 10-Year Plan

- Transmission development driven by commercial interest
 - Limited information in plan on current commercial constraints on using transmission system (to be remedied)
 - Congestion (high usage level) is not sufficient to indicate need for expansion
- More a “planning exercise” than a “plan” – WECC is not an implementing entity for transmission development
 - Aims to provide information to implementers
- High level reliability analysis is probably misfocused, though other efforts toward appropriate kind of reliability analysis in WECC are going on