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January 5, 2016

MEMORANDUM

TO: Council members

FROM: Tom Eckman and Power Division Staff

SUBJECT: High Level Summary of Public Comment and Proposed Responses

BACKGROUND:

Presenter: Tom Eckman

Summary: Public comment on the Draft 7th Power Plan closed December 18, 2015. In addition to the oral comments received at the eight public hearings held across the region, a total of 470 comments were received, 380 of those were provided in writing. Nearly 150 individuals submitted written comments or offered letters in support to the comments provided by public interest organizations.

In general, nearly all of the organizations and individuals supported the Draft 7th Plan's resource strategy's reliance on cost-effective energy efficiency and demand response to meet most load growth. There was less agreement on the roles that natural gas generation and renewable resources should play. Utilities largely endorsed the need for additional gas-fired generation to replace retiring coal plants. In contrast, environmental and renewable energy advocates and many individuals viewed the draft plan's finding that additional renewable resource development is unnecessary, except to meet existing state-mandated renewable portfolio standards, as short-sided and potentially based on faulty analysis and assumptions.

Comments on the proposed action items focused on the draft plan's regional conservation goal (RES-1) and on demand response (RES-4). Bonneville, utility trade associations, and individual utilities recommended that the final plan specify the conservation goal as a range. Environmental and renewable energy advocates and many individuals, on the other hand, strongly endorsed retaining the draft plan's goal to develop 1,400 average megawatts of energy efficiency by 2021 as a minimum. These two general groups also differed on the need to include a specific goal for demand response in the final plan. Environmental and renewable interest groups stated that the final plan should be specific about the level of demand response that should be developed, recommending 700 to 1,100 MW be targeted by 2021. Bonneville and utilities supported retaining the language in the draft plan's action item, which did not set a regional goal for demand response development.

A more detailed summary of comments appears below. Where the Council has already provided guidance on responses to a general comment (e.g., lowering the gas price forecast range, updating conservation potential assessment inputs) this is noted in the narrative.

Relevance One of the Council's principal charges under the Act is to involve and engage the public in developing its fish and wildlife program and power plan. Public comments on the plan provide valuable feedback on the power system issues important to the region and also serve to vet the plan's technical analysis. The Council relies on comments to call attention to issues that have not yet been addressed in the plan, as well as issues that may require additional analysis or discussion.

Workplan: 1. B. Develop Seventh Power Plan and maintain analytical capability
Complete draft plan resource strategy and draft action plan

Background: In the accompanying document, comments have been organized into three sections:

- Resource Strategy
- Specific Action Items
- Technical Analysis Input Assumptions and Modeling

More Info: Staff will prepare proposed responses to these comments for discussion with the Council at its meetings over the coming weeks.

Comments on Elements of the Resource Strategy

Role of Energy Efficiency in Resource Strategy – Should the resource strategy state regional goals for energy efficiency development as a range rather than a single value?

- A broad array of public utilities, the Public Power Council, PNUCC and the Bonneville Power Administration called for the Council to adopt a range of energy efficiency goals.
- Proponents believe the range is advisable to account for uncertainty of future load growth, gas and electricity price projections, and other factors that can affect the region's ability to acquire conservation. Adoption of a range for energy efficiency development would recognize this uncertainty.
- Public Power Council and a few others recommend that a conservation target matching the range of the scenario results would be the most accurate and prudent.
- PNUCC recommends a range from 1,300 to 1,450 aMW.
- Bonneville states that it will ultimately develop its own a six-year action plan based on the 7th plan's six-year action plan goal.
- Others recommend a range based on the average conservation developed across the many scenarios analyzed in the draft plan.
- The Northwest Energy Coalition and a broad range of advocacy organizations called on the Council to adopt mid-point efficiency development from the social cost of carbon scenario as a minimum plan goal, and that this goal should be used to establish efficiency plans and budgets of Bonneville and the utilities.

Resource Strategy's Finding on the Need to Develop Demand Response – Should the resource strategy include a regional goal for demand response?

- Bonneville, PNUCC, Public Power Council, PNGC Power, and a broad array of public utilities support retaining the draft plan's current language calling for developing the capability to rapidly deploy demand response.
- These parties state that because the draft plan's analysis found that DR spanned a wide range across the 800 futures tested, the draft plan's resource strategy only called on the region to develop the capacity to deploy DR to meet winter capacity needs, it did not specify a minimum amount or range. As a result, the final plan should not have a demand response resource development goal.
- The Northwest Energy Coalition and a broad range of advocacy organizations called on the Council to adopt a goal for demand response, recommending that the final plan have a demand response development goal of between 700 – 1,100 MW by 2021. These groups and individuals argued that without a specific

measurable goal in the Council's plan for demand response, it would be unlikely that Bonneville and the region's utilities would aggressively develop it.

Resource Strategy's Finding on the Need to Develop Regional Capacity - PNUCC agrees with the plan's finding that the region's power system needs additional capacity resources to meet winter peak demand.

- The plan's finding aligns with what has been reported in the last several PNUCC *Northwest Regional Forecasts*.
- This is an important point in a time when energy resources with little peaking capability have been and are being proposed to be added to the region's power system to meet state renewable resource standards and federal carbon emission reduction mandates.
- Bonneville, however, wants to better understand what this might mean for the agency's need to develop DR, since the agency's own assessment does not indicate a need for winter-peaking resources.

Role of Existing Natural Gas in Resource Strategy – NWECC, Sierra Club, Climate Solutions, Renewable Northwest, and multiple individuals commented that the resource strategy relies too heavily on increased use of existing natural gas and new natural gas generation.

- These organizations are concerned that relying too heavily on natural gas generation while fuel prices are low and when emissions reductions requirements are just beginning risks overinvestment in carbon emitting resources and stranded costs in the future.
- In addition, multiple environmental organizations and individual commenters noted that methane emissions from natural gas may offset the benefits of its use, since methane has a significantly higher GHG potential than CO₂ and fugitive emissions from natural gas production could make it nearly equivalent to coal over its entire fuel cycle.

Role of New Natural Gas Generation in Resource Strategy - PNUCC commented that the draft plan may be setting an unrealistically low expectation for the need for natural gas-fired generation in the next six years. The Northwest Energy Coalition and others commented that according to their analysis of individual utility integrated resource plans, the region's investor-owned utilities are planning for somewhere around 1,700 megawatts of new natural gas resources, far exceeding any natural gas resource development envisioned by the draft plan.

- PNUCC agrees that the final plan should focus on carbon-free resources to the extent possible. However, it should be acknowledged that the need to maintain a

reliable power system could require some utilities to build new natural gas generation, depending on future conditions.

- PNUCC states that one reason the draft does not see the need for new thermal resources is due to the Northwest being modeled as a single utility. This assumption allows the hydro system to be optimized for all utilities, public and investor-owned. In reality, investor-owned utilities must compete with other buyers, such as California, for surplus federal system power. As a result, the plan likely overstates the amount of energy and capacity available to serve Northwest utility loads.
- PNUCC recommends the final plan recognize that the need for new energy and capacity resources, including new gas-fired power plants, may be underestimated because of the single-utility perspective built into the models.
- Northwest Energy Coalition urges the Council to emphasize in the final plan the steps that the region can take to avoid costly investments in new greenhouse gas-emitting resources.

Regional Resource Utilization – Do regional IOU customers compete with out-of-region buyers for Bonneville’s surplus power?

- Bonneville commented that the language in the draft plan does not accurately reflect Bonneville’s sales of surplus power under applicable statutes. Regional IOUs may request firm power, though such power is subject to Bonneville’s marginal cost-based rate, so IOUs have historically refrained from requesting firm power from Bonneville, electing instead to receive benefits under the residential exchange.
- Bonneville commented that if requested by a regional utility, Bonneville will sell its available surplus power in the following order: first to its public utility customers and cooperative customers; second to its regional IOU and DSI customers; third to out-of-region public utilities; and fourth to all others.
- Bonneville commented that it does sell available surplus power to IOUs and public utilities under its wholesale power rate schedule, which basically sets Bonneville’s pricing at or close to market. Bonneville must sell surplus power to the region’s IOUs if there are competing requests from both in-region and out-of-region buyers
- PNUCC commented that the draft plan’s thermal resources appear to be under-dispatched, creating unrealistic low carbon dioxide emission forecasts. PNUCC suspects this is due in part to the model optimizing hydroelectric production to serve the region, rather than the normal practice of some hydro being sold out-of-region instead of displacing in-region resources.
- Public Power Council recommends that the “Regional Resource Use” section of the draft plan be removed from the final 7th Power Plan because it is both factually dubious and outside the purview of the Council.

Role of Renewable Resources in Resource Strategy – Northwest Energy Coalition, Climate Solutions, Sierra Club, Renewables Northwest, Washington Environmental Council, and other public interest organizations and multiple individuals commented that the Council’s modeling of the value of the role of renewable resources over the 20-year planning horizon is flawed. They argue that additional renewable resources would have been identified as cost-effective had the following been corrected:

- The Council’s current modeling approach does not recognize the ability of renewable resources and associated measures to contribute significantly to winter and summer peak needs.
- Renewable resources and resources that help integrate renewables, such as geothermal, storage, energy market improvements, smart grid applications, customer behavioral programs, were not modeled
- The Council didn’t model scenarios in which transmission would be available to new Montana wind plants if Colstrip units 1-2 were closed..
- The Council did not calculate the Associated System Capacity Contribution for renewable resources.
- The Council’s cost projections for solar PV beyond the action plan period are too high.
- Distributed solar photovoltaic resources were not modeled as a resource selection in the RPM, except under the Maximum Carbon Reduction Emerging Technology Scenario (3B).

Comments on Elements of the Action Plan

Energy Efficiency

The Council received comments on the conservation-related action plan items from Bonneville, several regional public and investor-owned utilities, Northwest Energy Efficiency Alliance, the Washington State Energy Office, Oregon Department of Energy, Northwest Energy Coalition, and several other interested parties. The following action items received the most comment:

- **RES-1** Achieve the regional goal for cost-effective conservation resource acquisition. Comments on this action item were discussed under the resource strategy section where multiple parties suggested these goals should be provided as a range (not fixed levels) and others suggested the goals should be minimums.
- **RES-2** Evaluate cost-effectiveness of measures using methodology outlined. Several utilities commented that the language should assure that this

methodology is meant to be applied generically with parameters determined by individual utilities.

- **RES-3 and BPA-2** Develop methods to identify system specific, least-cost resources and maintain system adequacy. Northwest Energy Coalition, Oregon Department of Energy, and the Washington Energy Office support this action item. Washington Utilities and Transportation Commission supports expanded work in the draft plan on resource adequacy. BPA reserves the right to choose the appropriate forum for implementing this action item.
- **BPA-6** Assess Bonneville’s current energy efficiency implementation model and compare it to other program implementation approaches. Three parties suggested this item was out of the plan’s scope and three other parties (including Bonneville) indicated support.
- **MCS-1** Ensure all cost-effective measures are acquired. Multiple parties expressed support for ensuring that hard-to-reach populations have access to energy efficiency programs. One commenter expressed concern about the additional reporting requirements of this action item.
- NEEA provided comment on **REG-2**, where they highlighted which action items were not in its current business plan.
- **ANLYS-8, ANLYS-6** Identify and analyze significant non-energy impacts. Multiple parties commented on the action items to improve the process to quantify non-energy impacts. Northwest Energy Coalition called for more comprehensive analysis of non-energy impacts and better documentation. Several utilities cautioned that prioritizing water savings is out of scope. Others are concerned about spending too much analytical time on non-energy impacts at the expense of other analysis.

Demand Response

Commenters generally supported establishing a Demand Response Advisory Committee (**COUN-1**) and the Council’s continued support of the Pacific Northwest Demand Response Project (PNDRP) (**COUN-2**). Multiple parties recommended that the scope of the Demand Response Advisory Committee be expanded to include distributed standby generation, distributed energy storage, transactive energy, and other specific “smart grid” or “grid edge” technologies in addition to focusing on the near term barriers to deployment of demand response and estimating its future potential.

Bonneville commented that demand response does not fall within the meaning of “resource” as defined by the Power Act. Bonneville recommends that demand response properly be considered a “reserve” function.

Commenters were concerned with the potential and costs for demand response in the draft plan. Some indicated that the costs were too low, including Bonneville, while

others indicated that they were too high. Some thought the potential and the DR program ramping was overstated, including Bonneville; others thought that it was understated.

Several commenters indicated that system specific conditions may not conform to the regional view of demand response and that the draft plan over optimized the deployment of demand response.

The following action items concerning demand response received the most focus:

RES-4 Expand DR Infrastructure. Comments on this action item are discussed under the resource strategy section.

RES-5 Support regional market transformation for demand response. NEEA commented that this is not currently covered under their business plan and that adding demand response features to current end-use market transformation activities could likely be incorporated without large resource impacts. NWECC and TechNet support this action item. ODOE recommends that utilities that do not plan to implement DR initiatives be directed to participate in market transformation efforts. Idaho Power does not support any action expanding the responsibilities of NEEA.

BPA-3 Continue efforts to establish demand response. Bonneville stated that it is premature to develop rules for the acquisition of demand response. The Washington Energy Office commented that this action item should include a timeline

Bonneville and Council Actions - Reserves

The following action items related to Bonneville and Council analysis of operating reserves received significant comment:

BPA-7 and COUN-7 Bonneville and the Council should perform an analysis of operating reserve requirements. Bonneville agreed that this type of analysis needs to be done, but wanted to clarify that the definition of reserves in the Power Act applies to benefiting the firm power customers of Bonneville. Industrial Customers of Northwest Utilities commented that this lies outside the Council's planning responsibility. Public Generating Pool, Public Power Council, and SnoPUD all recommended deleting this action and indicated the **REG-4** action item on collaborating on the collection of operating reserve planning data was sufficient for the Council's purposes.

Council Analytical Methods

Multiple parties commented on the following action item regarding the treatment of ancillary services in the Council's modeling process:

ANLYS-20 Review analytical methods. Smart Grid Northwest, Washington Utilities and Transportation Commission, and PGE commented that the potential for provision of ancillary services is under-represented and under-valued in the draft plan and that the action plan should address this deficiency.

Additional Action Item Recommendations

Eight additional action items proposed by commenters:

- Executives of a dozen Northwest utilities and organizations of the Northwest Energy Efficiency Leadership group recommended that the Council convene a regional forum/process, bringing together utility regulators, investor owned and consumer-owned utility leaders to explore the benefits of alternative business models and rate designs. These commenters raised concerns about stable or declining load growth for electricity at some utilities, which affects their ability to acquire energy efficiency. To address this tension, this group believes the region would benefit from a regional educational effort to explore alternative business models and rate design constructs. In addition, the group recommended the plan underscore the need to put energy efficiency on the same plane as other utility resource investments for both utilities and their customers.
- PNUCC recommended that the Council improve its quantification of the deferred transmission and distribution capacity benefits attributed to conservation measures.
- PNUCC recommends reverting to an earlier staff draft where secure and maintain thermal resource options was an individual action item rather than a bullet under the RES-3 action item to implement methods to identify system specific approaches to maintain resource adequacy.
- Northwest Energy Coalition, Renewables Northwest, Climate Solutions, and other public interest groups recommend that the Council support a regional low-carbon grid study.
- Smart Grid Northwest recommends that the Council promote investment in advanced metering infrastructure (AMI) and “transactive energy.”
- Smart Grid Northwest recommends either altering an existing action item or adding one on monitoring emerging smart-grid technology.
- Oregon Department of Energy and TechNet recommend an action item on quantifying the benefits of grid resiliency

- Oregon Department of Energy also recommends an action item to further develop analysis methodology regarding the impacts of sub-hourly markets on balancing and flexibility requirements.

Comments on Technical Analysis Input Assumptions and Modeling

Input Assumption - Load forecast, Natural Gas and Wholesale Electricity Prices

The Council received a number of comments regarding the draft plan's load, natural gas and wholesale market electricity price forecast. In response to those comments, at the December Council meeting, staff presented the proposed changes in the load and natural gas forecast. At that meeting, the Council agreed to lower both DSI load and natural gas price forecasts to more accurately reflect the market, while increasing the range of uncertainty. The DSI load forecast was lowered from 770 aMW to 338 aMW in 2018 and beyond. The medium natural gas price forecast was lowered by \$1 per MMBtu across all years of the forecast. Wholesale electricity market prices were also decreased by between \$3 and \$4/MWh over the forecast period to reflect the lower natural gas prices.

In addition to public comments on the DSI load forecast, natural gas and electricity prices, additional parties commented that the draft plan's load forecast did not incorporate the potential future loads from electric vehicles, nor the impact of distributed solar PV systems.

Input Assumption - Capacity Value of Conservation

There were many comments on the capacity value of conservation identified in the draft plan and the resulting action items. PNUCC, Public Power Council, and several utilities recommended that the Council use more conservative (i.e., lower) peak impacts from energy efficiency measures. Specifically, these commenters were concerned that the data used in the draft plan were over 25 years old and may not reflect current electricity use patterns. Many comments appear to believe that the capacity impact estimates from energy efficiency were based on a single generic input assumption. However, many commenters supported proposed action item **(REG-1)** to improve data for revised estimates of capacity impact of efficiency measures going forward. Some commenters are concerned about the level of effort required to update and improve these estimates and recommend a process to prioritize efforts.

Input Assumption - Cost-Effectiveness Methodology (Appendix G)

Several utilities thought the proposed cost-effectiveness methodology for energy efficiency was too prescriptive. In particular, commenters were concerned that local utility input assumptions should be used, rather than the values provided in Council's plan.

Input Assumption - Transmission and Distribution Deferral Credit

PNUCC and several utilities identified differences between the Council and utility-specific estimates of the value of deferred transmission and distribution costs. PNUCC identified errors in the cost averaging used by the Council. PNUCC recommended an action item to develop new data for these estimates going forward. Several utilities questioned the benefits of deferral if loads are not growing.

Input Assumption – Conservation Supply Curves

At its November meeting, the power committee provided staff with guidance to make several changes to the energy efficiency supply curve input data that staff proposed based on public comment it had received as of that date. The one over-arching technical change was to reflect Bonneville's recent decision to fund its energy efficiency programs by expensing their cost rather than capitalizing the costs over time. This change was made and resulted in a relatively minor overall reduction to the TRC net levelized cost of energy efficiency, since Bonneville's portion of the financing cost was eliminated.

Since the November Council meeting, staff received additional measure-specific public comments. A variety of measure-specific changes were made based on those public comments. These include correcting errors, identifying better measure savings and cost data sources, and incorporating updated building stock information. As a result of reviewing each of these comments, multiple minor changes (e.g., adjusting down the Industrial Project Energy Management ramp rate and revising commercial lighting applicability factors) were made to the assessment of regional conservation potential. As a result of these changes, technically achievable potential increased about 40 aMW. The changes also resulted in less residential and more commercial sector potential and minor shifts in costs and peak (KW) impacts. All of these updates have been incorporated into the RPM.

Input Assumption - Generating Resources

The following summarizes the high level comments the Council received on its analysis of the existing power system, new generating resources, and how it analyzed and

quantified the costs and benefits of the subsequent environmental effects of both. While this list is not meant to be exhaustive, it highlights the main comments. In addition, the Council also received several helpful suggestions from commenters to help clarify and sharpen the narrative in the written power plan—these suggested revisions do not affect the outcome of the portfolio analysis.

- **Solar PV costs.** Numerous commenters noted that solar PV prices have decreased significantly in recent years and that the trend is expected to continue before leveling out, suggesting that the estimated costs in the RPM are not low enough. As discussed at the December Council meeting, staff has included a lower cost PV scenario as an option for the RPM; however the reference plant costs for a solar PV plant still seem to fall within most future cost projections. In addition, staff amended the cost of PVs to account for the recent renewal of the investment tax credit, which was set to decrease from a 30 percent incentive to 10 percent in 2017 but will now remain at 30 percent until 2019 where it will step down to 10 percent by 2022.
- **Diversify resource options for the RPM.** Several comments concerned the lack of diversity in the resource options for the RPM, particularly around renewable resources, energy storage, and emerging technologies. Staff has developed a conventional geothermal reference plant (with limited potential) for inclusion in the final plan as a dispatchable renewable resource that is competitive with both variable energy renewables and thermal baseload resources. Staff also developed an additional solar PV reference plant for the west side. An emerging tech scenario includes estimates of solar PV with storage, small modular reactors, and enhanced geothermal.
- **Variable resources and their contribution to capacity.** Several commenters noted that while the Council included in its analysis of thermal resources a contribution to meeting capacity requirements, the Council did not do the same for variable energy resources such as wind and solar PV, thus making the latter appear less valuable to meeting power system capacity needs. Staff has developed an associated system capacity contribution for both wind and solar PV and will be incorporating these in the RPM analysis for the final plan.
- **Absence of smart grid.** A few commenters noted a lack of discussion on smart grid technologies (which had been addressed in its own appendix in the Sixth Power Plan) and the recommendation to look into more distributed energy resources for the Eighth Power Plan.
- **Carbon emissions cost from the existing system.** Some commenters noted that while the Council has made an effort to capture the incremental regulatory compliance operating costs of existing coal plants in the region, the Council appears to insufficiently capture the associated capital costs of the coal plants in the RPM. Others questioned the omission in the analysis (and subsequent costs)

of out-of-region coal plants that are paid for by Northwest rate payers. While the incremental regulatory compliance capital costs of the region's coal plants are included in the base total power system cost, they do not affect the model's resource dispatch order (like the operating costs do).

Input Assumption - Environmental Effects of New and Existing Generating Resources

- **Methane emissions, especially from the production and distribution of natural gas.** The Council received a number of comments to the effect that it did not sufficiently take into account the adverse climate effects of methane emissions from the production and distribution of natural gas, thus potentially overvaluing natural gas-fired resources. Methane, the primary component of natural gas, is a potent greenhouse gas. Though it has a shorter lifespan in the atmosphere than carbon dioxide, methane has a significantly higher capacity to trap heat. The Global Warming Potential (GWP) metric is used to compare the cumulative effect on temperature of a greenhouse gas to that of CO₂ on a per unit basis. Estimates for the GWP of methane ranging from 21 to 28; meaning one unit of methane is the equivalent of over 20 units of carbon dioxide in the atmosphere over one hundred years.

As modeled in the RPM, natural gas-fired generation has significant advantages over coal in terms of carbon dioxide emissions. An existing coal plant emits 2.9 times the amount of carbon dioxide as a new gas-fired combined cycle combustion turbine on a per MWh basis. However, potential methane emissions associated with the production of natural gas and coal is not included within the model. Some commenters recommended that if the full fuel cycle emissions of natural gas were included in the Council's analysis, the use of natural gas to reduce GHG emissions would be much less favorable. Several commenters suggested that a discussion of the accounting of methane emissions, in combination with carbon dioxide emissions, for both natural gas fired generation and coal fired generation be included in the final plan.

Natural gas systems, including the production, processing, and delivery of natural gas for power generation account for about one quarter of all methane emissions in the United States. These emissions include unplanned gas leaks (fugitive emissions) as well as intentionally vented gas. Methane emission rates from the natural gas infrastructure in the U.S range from 1.3 percent to 2.8 percent. Coal mining activities are also a significant contributor to methane emissions in the U.S., accounting for around 11 percent of overall emissions.

- **Hydroelectric generation.** The Council received a number of comments related to the environmental effects, costs, and benefits of the region’s hydroelectric resource, including:
 - **Lower Snake River dams/existing hydro and fish and wildlife in general.** The Council received a significant number of comments from environmental, fishing, and conservation groups seeking to have the Council (a) include in the Seventh Plan, as in the Sixth, a scenario explicitly analyzing the replacement resources and costs and overall implications for the power system of removing the four federal dams in the lower Snake River and (b) from many of these commenters, an independent analysis by the Council of the economic costs and environmental effects of retaining these four dams themselves. See the summary of comments on modeling below. The Council also received comments to the effect that the Council is not acting consistent with the Act if it does not develop and approve a new resource strategy that would allow for greater changes to the hydro system to benefit fish and wildlife, including the removal of the Snake River dams and substantially increasing spill. The Council also received opposing comments from utility and river user groups noting that the Council has adequately analyzed the implications for the region’s future resource strategy were the region to lose a generating resource of the magnitude of the lower Snake River dams, and that the Council need not and should not go further in its analysis of this matter. Some of these comments added that the draft Seventh Power Plan does not go far enough in recognizing the value of the existing hydroelectric generation, both economically and environmentally, and the significant contribution already made by the power system to address the needs of fish and wildlife in terms of operations and costs.
 - **Protected areas.** The Council received comments to preserve and strengthen the protected areas portions of the program, noting the interest both in general and in specific locations in developing new hydroelectric potential.
- **Nuclear generation.** The comments focused on the one existing nuclear power plant in the region, Energy Northwest’s Columbia Generating Station (CGS). Energy Northwest provided several comments intended to update, correct or supplement the discussion of the environmental effects of nuclear generation in Appendix I. In addition, the Council received renewed comments to analyze the

economic viability of continued operation of the CGS, an issue in part related to the plant's environmental effects.

- **Renewable resources and wildlife.** The Council received a comment from the Washington Department of Fish and Wildlife supporting the discussion and action plan item in the draft plan to investigate the cumulative effects to wildlife from the surge in renewable resource development and the existing and new transmission development, promising to participate to a significant degree and seeking to have the Council go further by establishing a process to identify and protect high value wildlife areas from this type of development. The Council also received comments from utility organizations that the Council should not become involved in the siting issues related to renewable resource development and that these matters are and should be addressed by the state and federal agencies with authority in these matters.

Modeling - Modeling of Renewable Portfolio Standard (RPS) at 35% Scenario

Several commenters, including Northwest Energy Coalition, Climate Solutions, Sierra Club, and Renewables Northwest stated that the Council's modeling of a regionwide 35 percent renewable portfolio standard was not carefully constructed to address the important question of how renewable resources can most effectively contribute to a low-carbon, least-cost system. Specifically, commenters stated that modeling of this scenario was faulty because:

- As modeled, this scenario applies the RPS to all load in the region not just the largest (mostly IOUs) utilities, resulting in new renewables being added to the system even when they directly compete with firm hydro in the region.
- The scenario assumed that 5,500 megawatts of new renewables would come from wind in the Columbia Gorge region, which is the most costly, least diverse, and lowest capacity value renewable energy resource modeled by the Council.
- Even though all of these new renewables are added to the system, the scenario does not retire any additional coal or natural gas plants (beyond what is already committed to retire by law).

Commenters further recommended removing the discussion of the 35 percent renewables scenario from the carbon dioxide emission sections of Chapter 3, Resource Strategies, and Chapter 15, Analysis of Alternative Resource Strategies. They argue that the RPS policies under consideration today specifically focus on reducing carbon-emitting resources and replacing them with clean energy resources.

Modeling - Modeling of CO2 emissions and Clean Power Plan

Several commenters, including Northwest Energy Coalition, Climate Solutions, and Sierra Club stated that the Council's modeling does not incorporate coal generator capital costs, which leads to an incomplete analysis of the cost of maintaining and operating these resources, and completely omits several coal generating units that serve Northwest customers and are paid for in NW electricity bills. Specifically they recommend that the RPM modeling be revised to:

- Fully account for and model the environmental costs of "in-region" coal generating plants.
- Appropriately reflect information for in- and out-of -region generators in all information relevant to EPA's Clean Power Plan.
- Revise the draft plan's discussion of carbon dioxide reduction policies, which appears to use the *Existing Policy* case as a reference case. This scenario does not fully consider how EPA's Clean Power Plan regulations will affect the Northwest electricity sector, so the name and use of this scenario are misleading because the scenario parameters do not accurately reflect existing policy.
- Include likely effects of the Clean Power Plan in the Existing Policy scenario or change the name of the scenario, adequately describe its assumptions in the plan, and refrain from using this scenario as a reference case in the final plan.

Modeling - Modeling of Lower Snake Dam Removal

Numerous commenters, including Northwest Energy Coalition, Sierra Club, Save Our Wild Salmon, and multiple individuals strongly recommended that the plan evaluate the cost and benefits of removing the four lower Snake River dams

- The draft plan failed to prepare the region for lost generation resulting from removal of the lower Snake dams or for dramatic reduction in the energy contribution from those sources.
- The Council should take an honest look at the power costs and benefits of maintaining or retiring the four large but limited-output dams on the lower Snake River to aid passage and survival of wild salmon stocks.
- Prior to and in preparation for its analysis and modeling, the Council should:
 - 1) Incorporate updated stream flow data based on regionally downscaled data from the Intergovernmental Panel Climate Change's Fifth Assessment Report and other scientific sources into its hydroelectric generation analysis as soon as they are available (estimated 2016), and;
 - 2) Have the Bonneville Power Administration, in the first quarter of 2016, provide a complete estimate of all power system costs needed to maintain and retain the lower Snake River dams over the next 20 years.

Fish and Wildlife

Comments on the action plan item on the effects of renewable resources on wildlife--both in support and in opposition--are summarized in the following section.

The Council received a number of comments on how the draft plan addresses the impact of new and existing resources, and the power system itself, on fish and wildlife. Nearly all of these have been summarized in the section on generating resources. These include comments about what should be said in the plan about the effects of the existing hydrosystem, especially the four lower Snake River dams, on fish and wildlife; the effects of renewable resource development and transmission infrastructure on wildlife; and new hydroelectric development and the protected areas protections for fish and wildlife.

The Council also received comments more generally about the relationship between the power plan and fish and wildlife and the Council's fish and wildlife program. Utility organizations urged the Council to discuss in more detail the value of the hydroelectric system to the region and the responsibility and costs it already bears to protect and mitigate fish and wildlife; that the Council assess in the power plan the effects of the fish and wildlife measures collectively on the adequacy, efficiency, economy, and reliability of the power system; and take steps to implement only the measures that are a priority and cost-effective. With regard to the impact of the hydrosystem on fish and wildlife, the Council also received comments that it should do more than approve a resource strategy that will allow the measures in the fish and wildlife program to be reliably implemented. The Council should also design a resource strategy that will allow implementing additional measures that benefit fish and wildlife while reducing hydrogeneration further, such as additional spill and mainstem dam removal.

Summary of Public Comment on Draft 7th Northwest Power and Conservation Plan

With Proposed Responses

January 11, 2016

Significant Level of Comment

- In addition to the oral testimony received at the eight public hearings held across the region:
 - 470 comments and consultation were recorded for the administrative record
 - 380 of those were provided in writing
 - Nearly 150 individuals submitted written comments or offered letters in support to the comments provided by other organizations

Proposed Process and Agenda

- **Monday Afternoon**
 - Discuss Proposed Responses To Comments on Resource Strategy
 - Discuss Proposed Responses to Comments on Technical Analysis Input Assumptions and Scenario Modeling
- **Tuesday Afternoon**
 - Discuss Proposed Responses to Comments Specific Action Items
 - Except for RES - 1 and RES - 4
- **Wednesday Morning**
 - Review and Discuss Results of Revised RPM Scenario Analysis
 - Review and Discuss Proposed Responses to RES – 1 and RES – 4
 - Remaining Comments

Comments on Overall Resource Strategy

- Nearly all of the organizations and individuals supported resource strategy's reliance on cost-effective energy efficiency and demand response
- There was less agreement on the roles that natural gas generation and renewable resources should play
 - Utilities largely endorsed the need for additional gas-fired generation to replace retiring coal plants.
 - Environmental and renewable energy advocates and many individuals questioned the draft plan's finding regarding renewable resource development

Resource Strategy's Finding on the Need to Develop Regional Capacity

- PNUCC agrees with the plan's finding that the region's power system needs additional capacity resources to meet winter peak demand.
 - Aligns with the last several PNUCC *Northwest Regional Forecasts*.
 - Important when energy resources with little peaking capability have been and are being proposed to be added to the region's power system
 - Bonneville wants to understand what this might mean for the agency's need to develop DR
 - Agency's assessment does not indicate a need for winter-peaking resources

Comments on Elements of the Resource Strategy

Note: Staff proposes that responses to these comments be discussed after the Council has had the opportunity to provide guidance on input assumptions and modeling and has reviewed and discussed updated RPM scenario analysis results based on revised inputs.

Role of Energy Efficiency in Resource Strategy

- Broad support for reliance on cost-effective energy efficiency to meet load growth
- Divided comment on the nature of the 7th Plan goal
 - Bonneville Power Administration, the Public Power Council, PNUCC and public utilities called for the Council to adopt a range of energy efficiency goals.
 - Range accounts for uncertainty of future load growth, gas and electricity price projections, and other factors that can affect the region's ability to acquire conservation.
 - PNUCC recommends a range from 1,300 to 1,450 aMW by 2021.
 - The Northwest Energy Coalition and a broad range of advocacy organizations called on the Council to adopt mid-point efficiency development from the social cost of carbon scenario as a minimum plan goal
 - This goal should be used by Bonneville and the utilities to establish efficiency plans and budgets

Role of Demand Response in Resource Strategy

- While there was general support for reliance on demand response to meet capacity needs, some parties expressed reservations about the region's ability to develop it
- Divided comment on the 7th Plan's goal
 - Bonneville, PNUCC, Public Power Council, PNGC Power, and a broad array of public utilities support retaining the draft plan's current language calling for developing the capability to rapidly deploy demand response.
 - Council's analysis found that the need for DR deployment spanned a wide range across the 800 futures tested
 - The Northwest Energy Coalition and a broad range of advocacy organizations recommending that the final plan have a demand response development goal of between 700 – 1,100 MW by 2021
 - Without measurable demand response goal in the plan, it is unlikely that Bonneville and the region's utilities will aggressively develop it

Role of Existing Natural Gas in Resource Strategy

- NWEC, Sierra Club, Climate Solutions, Renewable Northwest, and multiple individuals
 - Resource strategy relies too heavily on increased use of both existing and new natural gas generation
 - Relying on natural gas generation risks over investment in carbon emitting resources and stranded costs in the future
 - Methane emissions from natural gas may offset the benefits of its use if evaluated over entire fuel cycle

Role of New Natural Gas Generation in Resource Strategy

- PNUCC commented that the draft plan may be setting an unrealistically low expectation for the need for natural gas-fired generation in the next six years
- PNUCC recommends the final plan recognize that the need for new energy and capacity resources, including new gas-fired power plants, may be underestimated because of the single-utility perspective built into the models
- The Northwest Energy Coalition and others commented that:
 - Investor-owned utilities are planning for somewhere around 1,700 megawatts of new natural gas resources, far exceeding any natural gas resource development envisioned by the draft plan
 - Final plan should emphasize the steps that the region can take to avoid costly investments in new greenhouse gas-emitting resources

Regional Resource Utilization

- Bonneville commented that the language in the draft plan does not accurately reflect Bonneville's sales of surplus power under applicable statutes
- PNUCC states that one reason the draft does not see the need for new thermal resources is due to the Northwest being modeled as a single utility
 - This allows the hydro system to be optimized for all utilities, public and investor-owned
 - In practice, investor-owned utilities compete with other buyers, such as California, for surplus federal system power
- Public Power Council recommends this section of the draft plan be removed from the final 7th Power Plan because it is both factually dubious and outside the purview of the Council

Role of Renewable Resources in Resource Strategy

- Northwest Energy Coalition, Climate Solutions, Sierra Club, Renewables Northwest, Washington Environmental Council, and other public interest organizations and multiple individuals commented that the Council's modeling of the value of the role of renewable resources over the 20-year planning horizon is flawed because:
 - Does not recognize the ability of renewable resources and associated measures to contribute significantly to winter and summer peak needs.
 - Did not calculate the Associated System Capacity Contribution for renewable resources
 - Did not model scenarios in which transmission would be available for new Montana wind plants if Colstrip units 1-2 were closed
 - Did not model resources, such as geothermal, storage, energy market improvements, smart grid applications, customer behavioral programs that could help integrate renewables
 - Used cost projections for solar PV beyond the action plan period that are too high
 - Did not model distributed solar photovoltaic resources, except under the Maximum Carbon Reduction Emerging Technology Scenario

Comments on Input Assumptions

Note: The following include staffs proposed responses for updating the inputs to the RPM's scenario analysis

Input Assumption Load Forecast, Natural Gas and Wholesale Electricity Prices

- Multiple parties commented that the draft plan was based on outdated natural gas and electricity market price forecast. Some parties also commented on what appeared to be differences between the load forecast used for the Regional Resource Adequacy Assessment and the draft plan
- Response:
 - Council agree to use staff recommended revised load and energy price forecast at December Council meeting
 - Action Item "ANLYS-4 Review and enhancement of peak load forecasting" is includes a review of the consistency between different forecasts used in RAA and Council Plan
- *Proposed Council Guidance – No Action Necessary. Forecast have been revised per Council direction at December meeting*

Updated Natural Gas and Electricity Price Forecast

- After consultation with Natural Gas Advisory Committee, Council lowered long-term medium forecast by about \$1 dollar per mmBtu
- Wholesale Electricity Market Price forecast updated resulting in a \$3-\$4 dollar per MWh reduction in long-term prices in the medium forecast

Input Assumption Load Forecast, Natural Gas and Wholesale Electricity Prices Comments Requiring Clarification

Comments:

- Distributed solar PV installation were not included in plan.
- Load forecast did not account for increased use of Electric Vehicles (EVs)
- Climate change impacts on future loads should be incorporated into the Plan

Proposed Staff Response:

- Plan includes range forecast of distributed solar PV installations and EV loads
 - Chapter 7 and Appendix E pages 38-39 discusses the 7th Plan assumptions regarding distributed solar generation in the frozen efficiency load forecast
 - Chapter 7 and Appendix E pages 56-60 discuss the 7th plan assumptions regarding distributed future EV loads that are included in the frozen efficiency load forecast
- High range of load forecast used in RPM was designed to capture potential impact of climate change
- Appendix M and action items **ANLYS-22** and **COUN-11** describe actions the Council intends to more fully investigate the impact of climate change on loads and resources

Input Assumption: Capacity Value of Conservation

Capacity value of conservation

- PNUCC, PPC, and several utilities expressed concerns about reliability of estimated peak capacity impacts from energy efficiency
- Some recommended using lower peak impacts from EE
 - Potential misunderstanding regarding assumptions (some felt we were using a single point generic assumption)
- Many support REG-1 to improve these estimates going forward
 - Some concern about the cost and prioritization of this effort

Proposed Staff Response

- Agree some data are old, this is why plan includes Action Items REG-1, ANLYS-5, ANLYS-9, REG-5, REG-6 to improve inputs and reporting for peak impacts
- Do not change load shapes; no party submitted new data to support higher or lower impacts
- Revise draft language to note use of best available data and not a single point broad estimate
- Lowering the capacity impacts of EE will likely increase the need for additional EE, DR or other resources

*Proposed Council Guidance – Retain current assumptions.
Direct staff to draft proposed amended language*

Input Assumption: Transmission & Distribution Investment Deferral Credit

- Resources (e.g. energy efficiency, demand response, west-side generation) that defer investment in transmission and/or distribution system expansion receive a cost credit
 - PNUCC and several utilities identified differences between the Council and utility-specific estimates for the value of deferred T&D costs
 - PNUCC identified errors in the cost averaging used by the Council
 - PNUCC recommended an action item to develop new estimates for these values
 - Several utilities questioned the benefits of deferral if loads are not growing
- Proposed Staff Response
 - Include additional action item to develop new methods and T&D investment cost credit for next plan
 - Clarify language in Plan to explain rationale for assigning economic value to deferral of ongoing transmission and distribution investment
- *Proposed Council Guidance – Retain current assumptions. Direct staff to draft proposed new action item and amended language*

Input Assumption: Conservation Supply Curves

- Multiple changes to supply curve input assumptions were identified and/or proposed
- Proposed Staff Response:
 - Change assumption regarding how BPA's funds its conservation programs, now expenses rather than capitalizes
 - Revised inputs to reflect error corrections and updates
 - Adjusted Industrial Energy Management Ramp Rate
 - Commercial lighting applicability factors
 - Add New Industrial lighting assessment
 - List of about 40 other changes to specific measures or input data
 - Increases 20-year technical potential approximately 40 aMW
- *Proposed Council Guidance – Use revised assumptions. Direct staff to draft proposed amended language to Chapter 12 and Appendix G.*

Input Assumption: Direct-Application Renewables

- The Oregon Solar Energy Industry Association and a few individual commenters expressed concern that the potential of *direct application renewables* was not sufficiently evaluated in the plan
- Proposed Staff Response
 - Conservation Chapter 12, Generating Resources Chapter 13, and Appendix G describe the role and assess the potential of direct-application renewables under the Act
 - Conservation supply curves include estimates solar thermal water heating potential for direct application in the residential sector
 - Frozen efficiency load forecast reflects 80 to 220 aMW of load reduction from distributed solar photovoltaic resources
 - The potential contribution of solar photovoltaic (PV) above the baseline forecasts was assessed for two climate zones for residential and commercial applications.
 - These are modeled as supply options in some RPM scenario runs
 - No change to analysis. Expand discussion of results
- *Proposed Council Guidance – Direct staff to draft proposed amended language to Chapter 12 and Appendix G to expand discussion of direct application renewables.*

Input Assumption: Demand Response Supply Curve

- Multiple Comments were received regarding the cost data used to develop the assessment of Demand Response potential. Specific commenter provided data on the cost of installing space heating demand response controls and programmable communicating thermostats
- Proposed Staff Response
 - Increase in installation cost for space heating
 - Reduce price of the Programmable Communicating Thermostat (PCT) technology
 - Impact: No change in DR availability, cost increased in bin two and decreased in bin four
- *Proposed Council Guidance – Use revised assumptions. Direct staff to draft proposed amended language to Chapter 14 and Appendix J to reflect changes in the assessment of demand response potential*

Input Assumption: Solar PV Costs

- Commenters thought that the draft plan's current solar PV costs and cost forecast assumptions over the next 6 years is reasonable. However, several (NVEC, OSEIA, Renewables Northwest and individuals) also expressed concern that the long term cost forecast for solar PV is still too high
- Proposed Staff Response:
 - Solar costs have been updated with the recent Investment Tax Credit extension – lowers near term costs
 - A range of solar costs was developed, and a low cost solar option was made available in some scenarios in RPM
 - The solar costs for the reference plants are well within range of most future cost projections – indicating the estimates are reasonable
- *Proposed Council Guidance – Used revised assumptions. Direct staff to draft proposed amended language in Chapters 12, 13, and Appendices G and H to reflect revised cost estimates*

Input Assumption: Reserves Held for Balancing and Flexibility

- Bonneville commented that the final analysis needs to include regional balancing reserves, not just those for its balancing area. Bonneville also noted that its balancing reserves are not 900/1100 MW for INC/DEC. Bonneville changed to 400 MW INC and 300 MW DEC for Spring and 900 MW for both INC and DEC for the rest of the year, and these new values should be reflected in the final analysis
- Proposed Staff Response
 - Staff developed estimates for the reserves held for balancing and flexibility by non-Bonneville Balancing Authorities
 - Staff has re-estimated total reserves held for balancing and flexibility, including revised values for Bonneville
- *Proposed Council Guidance – Direct staff to use revised assumptions*

Input Assumption: Quantifiable Environmental Costs/Benefits of Particulate Emissions

- WUTC stated that the Plan should quantify health benefits and financial value of emissions reductions, especially particulates, for conservation measures that result in reduced wood burning and other activities that generate particulate emissions
- Proposed Staff Response
 - This issue was discussed extensively with Council during the development of the quantification of environmental costs and benefits methodology before draft power plan
 - In staff's judgment there is significant uncertainty in the ability to quantify the costs and benefits of particulate emissions in dollar terms with sufficient certainty to use in the plan, based on current information
 - Quantifying this one benefit without the ability to quantify others creates a problem for measure comparison
 - Staff recommends not doing more in Seventh Plan
 - RTF Policy Advisory Committee split on expending resources for further investigation. Thus ANLYS- 8 calls on RTF & RTF PAC to develop system to prioritize research on all non-energy impacts
- *Proposed Council Guidance – Use current assumptions. Direct staff to review language in Chapter 19 and Appendix I to determine if further clarification of Council's rationale for not including quantifiable environmental costs/benefits of particulate emissions is necessary*

Input Assumption: Accounting of Methane Emissions for Natural Gas and Coal

- The Council received a number of comments to the effect that it did not sufficiently take into account the adverse climate effects of methane (CH₄) emissions from activities related to natural gas-fired generation
- Proposed Staff Response:
 - Council's primary method for considering environmental effects is to reflect regulatory compliance costs in the analysis
 - Existing regulatory scheme exists for carbon emissions
 - Proposals for regulating methane emissions for new facilities are being considered, but not for existing facilities that are the source of most of the emissions
 - As a result, Council must address methane emissions in a qualitative way
 - RPM includes accounting for CO₂ emissions, but not CH₄; uncertainties too great to account for changes in methane emissions in same way
 - Provide additional discussion of the methane emission accounting related to the power system, its complexities and subtleties, and potential future compliance costs. Methane emissions are currently discussed in Appendix I
 - Even with uncertainties, cost estimates for significant CH₄ emission reductions in the natural gas system are low - and well within the modeled natural gas price uncertainty in RPM. So taking methane emissions and likely future controls into account does not indicate a significant change in range of gas prices, and thus little change in comparative value of natural gas
 - Add additional detail regarding investigation of methane emissions to Action Item ANLYS-18
- *Proposed Council Guidance – Direct staff to revise language in Chapters 1, 3, 13, 19 and Appendix I to reflect consideration of methane emissions as proposed above*

Background - Accounting of Methane Emissions for Natural Gas and Coal

- As modeled in RPM, natural gas-fired generation has significant advantages over coal in terms of carbon dioxide emissions – an existing coal plant emits 2.9 times the amount of carbon dioxide as a new gas-fired combined cycle combustion turbine on a per MWh basis. RPM does not include methane accounting.
- Methane (CH₄), the primary component of natural gas, is a potent greenhouse gas. Though it has a shorter lifespan in the atmosphere than carbon dioxide (CO₂), methane has a significantly higher capacity to trap heat.
- U.S. methane emissions by source
 - **Natural Gas and Petroleum Systems – 29%**
 - Enteric Fermentation – 26%
 - Landfills – 18 %
 - **Coal Mining – 10 %**
- In the Natural Gas System, fugitive emissions (unintentional leaks) and venting (intentional) can occur throughout the delivery and storage system
- Methane emissions occurring from coal activities include surface mining, underground mining, post mining activities, and abandoned mines

Background - Accounting of Methane Emissions for Natural Gas and Coal

- Uncertainty surrounding the magnitude of both methane emissions and climate impacts
 - Gas leak estimates for the natural gas system range anywhere from around 1% to 9% - most around 2% to 3%
 - Comparisons between the climate impacts of CO₂ and CH₄ are difficult, methane is significantly more potent, but much shorter-lived in the atmosphere
 - On a 100-year basis, the Global Warming Potential (GWP) of methane ranges from 21 to 36 times that of CO₂, while on a 20-year basis, methane is up to 86 times more potent than CO₂
 - Coal mining activities also emit methane, the magnitude of which is also uncertain – and coal's methane emissions are not always factored into comparisons between the fuels
- Current Regulation
 - EPA plans to finalized rule in 2016 reducing methane and VOC emissions from new gas and oil facilities
 - EPA operates Natural Gas STAR program – volunteer program for oil and gas industry to reduce methane emissions and increase operational efficiencies
- Future methane mitigation costs associated with natural gas are expected to be low, especially once the value of the conserved gas is factored in. A study found that projected methane emissions in 2018 could be reduced by 40% (down to around 1% emission rate) with currently available technology at a cost of 0.01 \$/Mcf of gas produced. Importantly, this cost is well within our modeled natural gas price uncertainty.

Comments on Modeling and System Analysis

Note: The following include staff proposed responses for updating RPM's scenario analysis and/or modeling approach

Environmental Compliance for Existing Coal Plants

- NWECC and Sierra Club questioned whether the Council sufficiently accounted for all the of the regulatory compliance costs (in particular capital costs) for existing coal generation in the RPM
- These organizations also stated that the Council's footprint of resources should include the out of region coal plants that are paid for by some PNW ratepayers
- Proposed Staff Response
 - Council's analysis does include the capital cost of environmental compliance of existing coal plants
 - Council's analysis considers existing resources that are impacted by new resource decisions within the region
- *Proposed Council Guidance – No change needed*

Recent Adequacy Assessment and the Draft 7th Plan

- PNUCC recommends that the final Plan acknowledge the results of the Resource Adequacy work and how they differ from 7th Plan findings. Idaho Power submitted similar comments
- Proposed Staff Response:
 - The 2016 adequacy assessment will use inputs based on the 7th plan and should involve examination of the impacts of this change
 - The 2015 adequacy assessment used inputs, particularly ones related to load and energy efficiency, established in the last power plan and thus should be considered an extension of the 6th Plan
- *Proposed Council Guidance – Direct staff to revise language in Chapter 11 to reflect changes between 6th and 7th Plan assumptions that affect the adequacy assessment*

Low Expectation for Natural Gas Fired Generation

- PNUCC is concerned that the draft Plan may be setting an unrealistically low expectation for the need for new natural gas-fired generation in the next six years
- PNUCC recommends the final Plan recognize that the need for new energy and capacity resources, including new gas-fired power plants, may be underestimated because of the single-utility perspective in the models
- Proposed Response:
 - Staff recommends additional discussion be added to Chapters 1, 3 and 15 to reflect the differences in assessment of regional versus individual utility resource development needs
 - *Proposed Council Guidance – Direct staff to revise language in Chapters 1, 3 and 15*

Low Thermal Dispatch from “Single Utility” Approach

- PNUCC notes the existing thermal generation in the RPM appears to be under dispatched creating unrealistic low carbon dioxide emissions because of the single-utility perspective in the models
- Propose Response:
 - Staff agrees that a regional dispatch may not capture market inefficiencies that lead to higher carbon emissions
 - Staff will add narrative on the potential magnitude of this difference
 - Staff recommends discussing this further in Chapters 1, 3 and 15
- *Proposed Council Guidance – Direct staff to revise language in Chapters 1, 3 and 15*

Accounting for WECC-Wide Carbon Emissions Due to Changes in Regional Exports

- PNUCC recommends the plan should discuss the impacts of reduced regional exports in potentially increasing carbon dioxide emissions in neighboring regions
- Proposed Response:
 - Staff recommends describing this phenomena in Chapters 1, 3 and 15
- *Proposed Council Guidance – Direct staff to revise language in Chapters 1, 3 and 15*

Incomplete Calculation of the Capacity Value of Renewable Resources

- Climate Solutions and NWECC both expressed concern that the capacity value of renewables was under-represented compared to Combined Cycle Combustion Turbines and Energy Efficiency, which were both given system capacity contribution numbers
- Proposed Staff Response:
 - Staff determined the capacity value of renewable resources to reflect their Associated System Capacity Contribution
- *Proposed Council Guidance – Direct staff to use revised ASCC values for resources modeled in the RPM, including renewable resources*

North Valmy Retirement

- Idaho Power indicates the assumption in the Plan to shutdown the two North Valmy coal-fired units in 2025 is overly restrictive as these units may, in fact, cease operation prior to or after that year. A closure date has not yet been determined by the owners
- Proposed Response:
 - Staff recommends acknowledging this in the narrative and leaving the 2025 retirement date as referenced in the owners' IRPs as a modeling assumption
 - *Proposed Council Guidance – Direct staff to revise narrative to reflect uncertainty regarding retirement of North Valmy, but retain assumption of 2025 retirement for modeling*

Diversify Renewable Resource Options for RPM

- Several commenters, including NWECC, Renewables Northwest and Sierra Club raised concern over the lack of diversity in the renewable resource options in RPM. Especially for MT wind with potential coal plant retirements, Geothermal, and Solar in other locations
- Proposed Staff Response:
 - Conventional geothermal option was developed for input to RPM
 - A new west-side utility scale solar plant option was developed as an input for RPM (complimentary to the existing S. Idaho reference plant option, and the S. Idaho with new transmission option)
 - A Montana Wind reference plant with Colstrip Transmission was developed and input in the Draft. Though it was detailed in Appendix I, it was accidentally left out of Chapter 13. This omission will be corrected for the final
 - Though not run through RPM, future energy storage systems with solar, Enhanced Geothermal, and Small Module Reactors were developed for the Maximum Carbon Reduction - Emerging Tech Scenario
- *Proposed Council Guidance – Direct staff to revise narrative to reflect changes to the renewable resource options considered in the RPM*

New and Existing Nuclear Generating Resources

- Energy Northwest commented on the environmental effects of nuclear and CGS in particular
- Oregon Physicians for Social Responsibility (PSR) stated that they believe SMR cost estimates and description of potential development too optimistic
- PSR also requested that Council examine economics of continued operation of CGS vs. replacement, under Seventh Plan scenarios (post-Seventh Plan)
- Proposed Staff Response
 - Staff working on clarifying language in Plan
 - Estimated SMR costs do not inform RPM analysis
 - The economics of CGS is not an issue for the Seventh Plan. Council can determine whether they want to take up post plan
- *Proposed Council Guidance – Direct staff to revise narrative to reflect updates to cost estimates and environmental effects of nuclear generation. Council can determine whether to review CGS economics post-7th Plan*

Generating Resources Odds & Ends

- Request to include more clarity regarding battery cost estimates and revise if necessary
 - Staff will clarify language in Chapter 13, Appendix I, and double check cost calculations
- Concern with only providing RPM an Aeroderivative combustion turbine for peaking service, rather than a less expensive Frame technology
 - Gas peaking options were discussed throughout the modeling process – aero technology was settled on as the most representative in terms of needs, cost and performance.
 - Reference plants were developed for three gas-peaking technologies (Recip. Eng, Aero, Frame) as options for users to select for consideration in the on-line version of RPM
 - This issue was extensively discussed and agreed upon in the Generating Resources Advisory Committee with input from the System Analysis Advisory Committee
- Concern that solar was considered “highly speculative”
 - Solar was considered a “primary” resource and was included in all modeling. Solar + Battery Energy Storage System was considered a long-term resource and was included in the Emerging Technology Scenario. Staff will revise narrative to clarify

Is Demand Response (DR) a Capacity Resource?

- BPA commented that demand response falls within the category of “reserves” and “does not fall within the meaning of ‘resource’ as defined in section 3(19) of the Northwest Power Act”
- Proposed Response:
 - DR provides reserves, and it also provides peaking capacity like a capacity resource – DR is a resource in the sense of its functions. Not necessary at this time to settle this as a legal point
- *Proposed Council Guidance – Direct staff to revise narrative to add explanation of why demand response functions as a system capacity resource*

Use of January Adequacy Reserve Margin (ARM) to Determine Need for Resource Builds To Meet Adequacy Standards

- Draft Plan’s analysis only used winter quarter (i.e. January) capacity requirements to determine whether and when new resources are required. Council’s LOLP metric measures resource need across all seasons. Therefore, RPM’s adequacy assessments should consider potential shortfalls in all seasons
- Proposed Staff Response:
 - Staff agrees that model analysis should consider shortfalls in all quarters
 - Developed estimates of seasonal (quarterly) ARM values for both energy and capacity
 - Used quarterly ARM values in RPM to assess whether resources are needed to maintain adequacy in every quarter
- *Proposed Council Guidance – Direct staff to use revised ARMs for final plan scenario analysis*

Use of Single-Hour Peak Load and 10-Hour Sustained Hydro Capability To Establish ARM Appears Inconsistent

- Bonneville noted that the ARM for capacity is calculated using single-hour peak load, while the hydro resources available to meet the single hour peak is based on its 10-hour sustained peaking capability. Bonneville recommended that the single-hour peak hydro capability should be also used.
- **Proposed Staff Response:**
 - The important factor is to use the same assumptions in determining the ARM in GENESYS and in its use in the RPM
 - Tests using GENESYS found that using the ARMs as calculated in the RPM produces resource builds that are within the 5% annual adequacy threshold
 - Changing hydro or load inputs to calculate different ARMs would result in similar outputs from RPM
 - PNUCC uses the same comparison for its NRF report
- *Proposed Council Guidance – Direct staff to use maintain current analytical assumptions*

Analysis Removal of Lower Snake River Dams

- Council received multiple comments from environmental organizations and individuals requesting that it run a dam-removal scenario similar to the one done for Sixth Plan
- **Proposed Staff Response:**
 - The scenario modeled for the draft concerning the planned loss of a large non-carbon resource provides sufficient direction as to what a resulting resource strategy would look like
 - Modeling the removal of these dams in particular would affect only certain details not captured in the scenario modeled, particularly the details of the hydro changes
 - The narrative in Chapter 3 and 15 describing the scenarios tested can be modified to highlight the differences between the analysis done for the 6th and 7th plans without modeling another scenario
- *Proposed Council Guidance – Direct staff to revise narrative in Chapters 3 and 15 to reflect differences between 6th and 7th plan's modeling of major resource loss as it relates to lower Snake dams*

Analysis Removal of Lower Snake River Dams – Part 2

- Council received multiple comments from environmental organizations and individuals requesting that it independently analyze the economic viability of the continued operation of the lower Snake River dams
- **Proposed Staff Response:**
 - Because this analysis would not affect the new resource analysis, resource scenarios, or resource strategy that are the focus of the plan it is not a power plan issue. The power plan has no element or effect relating to the viability of or whether to continue or remove existing resources
 - The Council could, if it and the region wished, take up this analysis after the completion of the Seventh Power Plan. It could also decide not to dedicate resources to this task
 - If the Council took up the analysis, our assessment would be limited to matters within our expertise, primarily the power system aspects of the current operation, plus possibly review by the IEAB of the studies by others of the other parameters of the operation of these dams (such as o&m costs)
- *Proposed Council Guidance – Direct staff to prepare response to commenters which explains rationale for not including analysis of lower Snake River dam removal as scenario and . . .*

Value of Hydro System/AEERPS/F&W Program

- PPC recommended that the Council include more in the plan to recognize the value of the hydro system and its contribution to addressing needs of fish and wildlife; continue to assess fish and wildlife program's effects on adequate, efficient, economic, and reliable power supply; hold fish and wildlife program accountable to existing budgets even if new fish and wildlife priorities are to be funded
- **Proposed Staff Response:**
 - Comments primarily relevant to fish and wildlife program and program implementation, not power plan
 - Staff recommends no changes to plan narrative, but will review to ensure text is accurate in describing hydro system and role of fish and wildlife
- *Proposed Council Guidance – Direct staff to review and revise narrative describing hydro system and role of fish and wildlife*

Protected Areas

- Preserve and strengthen protected areas, especially given interest in new hydro development

- Proposed Staff Response:
 - Protected areas designations remain unchanged
 - Protected areas provisions are reviewed during fish and wildlife program; no need or benefit from reviewing again in power plan, since Act deliberately place development of fish and wildlife program ahead of power plan development to set the basis for power resource planning
 - Protections remain strong

- *Proposed Council Guidance – Direct staff to clarify timing of protected area review*