NW Energy Coalition

for a clean and affordable energy future

Date: December 18, 2015

To: Northwest Power and Conservation Council

RE: Comments on the draft 7th Power Plan

Introduction

The NW Energy Coalition is pleased to offer the following comments on the NW Power and Conservation Council's ("Council") draft 7th Power and Conservation Plan ("draft Plan"). The NW Energy Coalition is an alliance of more than 100 environmental, civic and human service organizations, progressive utilities and businesses in Washington, Oregon, Idaho and Montana working to promote development of renewable energy and energy efficiency, consumer protection, low-income energy services, and fish and wildlife restoration on the Columbia and Snake rivers. The Coalition has a long history of active involvement in the Council and its plan development process.

The NW Energy Coalition's vision for the Pacific Northwest electric system over the next 20 years is remarkably similar to the pathway established in the draft 7th Plan. We envision a future in which energy efficiency meets all load growth across the region, allowing us to keep costs low and avoid greenhouse gas emissions. Residents, businesses and industrial customers will participate even more actively in progress toward a clean energy grid by engaging in demand response programs and installing distributed renewable generation technologies. Utilities across the region will continue to make progress toward managing the system in an effective, flexible manner – improving markets, scheduling and transmission systems and finding smart grid solutions.

We also share the conclusion that in the short term, existing natural gas plants will play an important, but temporary, role in helping the region close existing coal plants and significantly reduce greenhouse gases. The primary area where our future diverges from that of the draft 7th Plan is in the role renewable resources will play over the next 20 years.

The Coalition sees renewable resources, not new natural gas, contributing the most to our clean energy future over the next 20 years and at the least cost, least risk and fewest greenhouse gas emissions. Our analysis of the electric system convinces us of the near-term need for renewable resources to address system needs, and that renewable resources will proliferate as we improve our methods for integrating variable resources, creating a more diverse, flexible and reliable Northwest power system over the longer-term.

The draft 7th Plan shows that the region's current investments in energy efficiency and renewables have put the four Northwest states on-track for a 35% cut in carbon emissions by 2035. The draft Plan illustrates that we can do much more to reduce carbon. The Council finds that the region could easily cut carbon emissions as much as 80% at a cost of $20 billion compared to the *Existing Polic*y scenario – not counting very substantial health and climate benefits. Using existing technologies and shutting down coal plants and the highest-emitting natural gas plants get us much of the way to this cleaner future, and further innovation and cost reduction for renewables, efficiency measures, storage and smart grid promise to take us all the way and likely for much lower cost. The Coalition envisions that we can do this, and more, by effectively integrating renewable resources rather than expanding our long-term use of natural gas.

The following comments detail our recommendations for strengthening the 7th Plan that will lead the region over the next five years and beyond.

I. Energy efficiency

The region's historic accomplishments have made energy efficiency the region's second-largest resource (after hydropower). With the Council's six previous plans showing the way, we have saved more than 5,600 average megawatts since 1980, reducing electricity bills by about $3.5 billion per year and drastically reducing climate-changing carbon emissions – by nearly 21 million tons in 2012 alone. After more than three decades of energy efficiency investments region-wide, the achievable and cost-effective resource potential remains robust.

The Council's 7th Plan analysis shows we can get 4,500 average megawatts (aMW) of new energy efficiency in the next two decades and meet almost all of the Northwest's new power needs. Some scenarios find up to 5,000 aMW of energy efficiency acquisition. In every possible future envisioned by the Council, energy efficiency acquisition is the undisputed first choice for the regional power strategy. In fact, in the scenario in which energy efficiency is purposely reduced, power system costs rise 16%. Perhaps most exciting in the 7th Plan efficiency analysis is the recognition that the energy efficiency resource provides almost 10,000 megawatts of capacity benefits to the region.

Energy efficiency remains our least-cost, least-risk, lowest-carbon resource. It reduces family and business utility bills and provides good jobs in every community. In a region where 90 of Bonneville Power Administration's 142 customers are expected to soon exceed their Tier 1 allocations, maximizing energy efficiency is the only logical way to contain costs associated with new generation.

The Coalition supports the specific six-year action plan target of 1,400 aMW for energy efficiency and the associated biennial milestones described in RES-1. The target and milestones should be viewed as a floor, not a ceiling. In accordance with the Northwest Power Act, the goal for our collective energy efficiency programs must be to capture all available cost-effective energy efficiency. The Council's targets influence the budgets and conservation targets for numerous utilities across the region and therefore help to determine how much energy efficiency we ultimately will acquire.

The Council should be bold in setting energy efficiency targets – ensuring that they represent the high end of what the region needs to achieve. Recent regional energy efficiency efforts have delivered remarkable results consistently exceeding the action plan targets. This is great news. Still, over the past 15 years the region's planners have consistently underestimated the amount of cost-effective energy efficiency available.[1]

Current energy efficiency planning and forecast methodologies – including those used in developing the 7th Plan – underestimate the pace of market changes, overlook synergistic savings and those from operational and behavioral improvements, and are constrained by outdated "achievability" assumptions.

Planning efforts, including the 7th Plan, have not adequately accounted for savings from technological synergies, optimal operations or user/occupant behaviors. Planners, in part due to the traditional measure-by-measure approach to calculating energy efficiency potential, have undercounted the results of design optimization. They often under-predict the pace of market acquisition of efficiency technologies by using ramp rates and through the overall assumption that we can achieve only 85% of any given measure's economic potential. Resource planners assign these constraints to represent their assessments of market barriers to adoption and the pace of achievable conservation. In addition, measuring and verifying program and measure savings long after implementation limits utilities' ability to fine-tune their programs to improve savings. Better use of communication and information technologies to track savings more quickly could improve program realization rates.

A shift in how we represent market possibilities, coupled with improved marketing, education and savings measurement programs, should yield greater achievements. A number of the recommendations in the draft Plan (REG-9: whole building consumption data; MCS-4: work plan to focus on emerging technology; and ANLYS-3: develop an end-use conservation model) will improve these methodologies, allowing the Council to establish more robust energy efficiency supply curves for the 8th Plan. Knowing that the current plan takes conservative approaches that likely underestimate energy efficiency possibilities, it makes sense for the Council to establish strong targets in the meantime.

Different communities and utilities face varying economic circumstances, leading to different perspectives on the local near-term economic effects of energy efficiency acquisition. The region would benefit from exploring opportunities to ensure that all utilities capture value from pursuing energy efficiency acquisition.

The Coalition supports the draft Plan action item BPA-5: Quantify the value of conservation in financial analyses and budget setting; BPA-6: assess BPA's current energy efficiency implementation model and BPA-9: a report that identifies barriers to BPA customer energy efficiency acquisition, as actions that will help make progress on this issue. The Coalition further recommends that the Council convene a regional forum/process, bringing together utility regulators, investor-owned and consumer-owned utility leaders, along with a full range of other

[1] See *The Pace of Progress*, http://www.nwenergy.org/data/Emerging-Tech.pdf

stakeholders, to explore the benefits of strategies, such as alternative business models and rate designs, that seek to ensure benefits.

Low-income and other hard-to-reach customer segments comprise another promising area for improved energy efficiency acquisition over the 7th Plan action period. The Coalition appreciates the draft Plan's acknowledgement of the potential for better serving hard-to-reach customers with energy efficiency.

We thank the Council for the extensive recommendations contained in MCS-1 that provide detailed recommendations for how to advance energy efficiency programs for low-income customers and other hard-to-reach segments. All electricity consumers pay for efficiency programs in their bills, and we strongly support the emphasis on serving low-income consumers, multi-family buildings, and other hard-to-reach segments outlined in the draft Plan's model conservation standards.

The Coalition also would like to specifically mention strong support for the following action item recommendations contained in the draft 7th Plan that support continued, strong energy efficiency programs throughout the region:

- REG-1: new end-use load shape study
- REG-2: support for NEEA

II. Demand response

The draft Plan identifies more than 4,300 megawatts of demand response potential, and suggests that a significant portion, more than 1,500 megawatts, could be available at relatively low cost. Expanding demand response programs – incentives and other measures that change when people use power – flattens demand peaks and increases system efficiency and reliability. It is least-cost because it avoids costly construction and overuse of gas-fired plants.

Demand response has proven enormously successful in the PJM market where it has saved consumers $16 billion[2] and essentially held up the grid during the Polar Vortex,[3] when consumers responded in the winter even though many had committed only to summer curtailment. In addition to consumer savings and grid stability, a Navigant report filed at the Environmental Protection Agency in the Clean Power Plan rule found that demand response produces significant system-wide carbon emission reductions.[4]

The draft 7th Plan is clear that the region needs to aggressively implement demand response programs to help meet peak demand. The Council sees demand response programs, still in their infancy in this region, as a high priority but dropped a regional 700-megawatt goal from the draft Plan. The Council should push BPA and utilities to aggressively pursue this nascent resource and set a 700- to 1,100-megawatt goal by 2021 for demand response in the final 7th Plan. In addition

[2] FERC 2014 Report: https://www.ferc.gov/legal/staff-reports/2014/demand-response.pdf
[3] Link to PJM Polar Vortex report found here: http://aem-alliance.org/demand-response-reduces-grid-stress-pjm-polar-vortex/
[4] Link to Navigant report here: http://aem-alliance.org/study-finds-significant-greenhouse-gas-savings-demand-response-group-urges-epa-incorporate-clean-power-plan/

to establishing a specific goal, we support the demand response-related action items RES-3 and RES-4, and elements of REG-2.

Additionally, the draft Plan notes that some demand response resources can do much more than help meet peak load. They can provide a flexible response to changing grid conditions and offer important ancillary services such as contingency reserves, regulation, and load following. These services will become increasingly important as the region outgrows the capacity traditionally provided by the region's hydrosystem and some natural gas-fired peaking plants. The Council should establish a specific action item to expand the application of demand response in the RPM and include additional means of variable generation integration.

Regional market transformation efforts will be critical to successfully implementing demand response. NEEA has increased the market penetration of many energy efficiency products and should be encouraged to do the same for new demand response products. We strongly support action item RES-5 related to market transformation efforts.

Council leadership and coordination on the effective development of demand response programs across the region is essential; for example, the Council has played a strong role in coordinating the Pacific Northwest Demand Response Project. We strongly support action item COUN-1 that recommends establishing a demand response advisory committee, but encourage the Council to widen the committee's scope to include a broader array of smart grid and grid edge applications (see electric grid improvements section below). This effort also should include purposeful evaluation of consumer interests (including low income, disabled and elderly) in various grid edge applications.

III. Role of natural gas

The draft Plan finds almost no possibility that the region will need any new natural gas plants in the next 10 years, assuming achievement of the Council's energy efficiency and demand response goals. The draft Plan emphasizes that more efficient power markets and transmission improvements can make that finding true for individual utilities as well. The action steps outlined by the Council will help the Northwest reduce the need for new natural gas plants on a utility-by-utility basis.

The Coalition engages in many individual utility-planning processes (integrated resource plans or IRPs) across the region. From our recent involvement in IRPs, we note that 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 7th Plan.[5] We urge you to keep this disconnect in mind as you draft the final plan and emphasize the steps that the region can take to avoid costly investments in new greenhouse gas-emitting resources.

The fuel price of natural gas going forward is naturally a substantial concern and a major driver for the Council's modeling suite and resource acquisition plans across the region. For the last five years, following the maturation of hydrofracturing technology and the revival of onshore

[5] According to the draft Plan, the average build-out of new natural gas generation over all futures in most scenarios was less than 50 aMW by 2026 (page 1-12).

domestic gas production, natural gas has been in persistent oversupply relative to demand in North America, providing a cost advantage, relative price stability and a strong price signal.

We cannot predict how quickly and how high gas prices will rise. We commend the Council's careful and risk-sensitive reliance on the best available industry forecasts, expert assessment within the region, and use of the RPM's probabilistic features to represent gas price potential and risk going forward, noting that sudden shifts in the "gas price deck" happen frequently at decadal scales.

IV. Renewable resources

The draft Plan is shortsighted in calling only for those renewables already required by Northwest state policies. Yet several renewable resources (eastside utility-scale solar and Montana wind, for example) already compete cost wise with new natural gas plants. The Council's model falls far short in its assessment of the role of renewable resources over the 20-year planning horizon. Addressing all of the models significant deficiencies in time for the final 7th Plan is unlikely. Our following comments summarize the analytical deficiencies and provide recommendations for addressing these issues for the final plan.

The Council's modeling suite (RPM, Genesys and Aurora) identifies a significant need for energy on the coldest of winter days ("winter peak") that drives the majority of the model's resource development (including energy efficiency and demand response). The Council's current modeling approach does not recognize the ability of renewable resources and associated measures to contribute significantly to this winter peak need.

First, the model undervalues the contributions of renewables to meeting the region's winter peaking needs and completely omits other measures that will help integrate renewables, such as battery storage and many smart grid applications. Second, the modeling approach obscures summer peaking needs that are growing rapidly throughout the region. Consequently, even though the Council draft Plan finds that some renewables cost less than natural gas resources the model does not choose the renewables. Instead, the model tends to select new gas instead of renewables to replace dispatch from coal plants in carbon-reduction scenarios. The Council should improve the way the model analyzes the benefits of renewable energy resources.

Additional concerns with the Council's renewables modeling include:

1. *Omitting some renewable resources and resources that help integrate renewables*. The 7th Plan modeling does not include geothermal, storage, energy market improvements, smart grid applications, customer behavioral programs, and many other emerging technologies and approaches that will help our electric system become smarter, cleaner and more effective at incorporating renewable energy.

2. *Incomplete modeling of transmission systems*. While the draft plan identifies Montana wind and Idaho solar as least-cost resources, the analysis limits them due to perceived transmission constraints. In most scenarios, the model does not consider additional realistic scenarios, such as the probability of Colstrip units 1-2 in Montana closing in the next few years, making the transmission that those plants now use to reach West Coast markets available to new

renewables. Not modeling these scenarios significantly increases the cost of renewable resources.

3. *Incomplete calculation of renewables' capacity value***.** The Council calculated a value adder (associated system capacity contribution or ASCC) for natural gas and energy efficiency to represent how they interact with the system to serve times of increased electricity need. The Council, however, made no such calculation for renewable resources. The Council plans to calculate these values for wind and solar resources and associated resources and measures, but did not complete this in time to influence the draft results. This puts these resources at a disadvantage compared to natural gas and energy efficiency resources.

4. *High long-term solar costs*. The Council has made significant steps in reviewing recent and current solar cost trends; the supply curve costs used by the Council over the six-year action plan period are fairly reasonable. However, the Council's cost projections beyond the action plan period are much less so. The Coalition asserts that solar prices will drop more rapidly than the Council's post-2020 reference costs indicate, given substantial solar market growth and likely cost reductions over the next decade-plus.

   The Council averaged a variety of future cost projections from several respected research organizations. However, the projections used actually come from two very different perspectives: cost-trending and experience curve analysis. The Coalition recommends relying on the latter, rather than a blend of the two approaches. The experience curve approach has been used to assess solar PV specifically since a 1980 study by NREL (then SERI). Experience curve analysis has proven robust within many industries and products (*Santa Fe Institute, 2011*). Its advantage is that it uses a simple metric: cost reduction per doubling of aggregate market penetration. This overcomes many problems in traditional trend projection over longer periods, including the effects of the business cycle, policy interventions, changing market structures and substantial market penetration. Overall, we believe the experience curve approach is a very good tool for long-term resource planning and recommend that the Council use it, rather than a blend of cost-trending and experience curve analysis, in the 7th Plan for solar and other technologies such as certain energy efficiency measures and storage undergoing rapid technology development and market penetration.

5. *Distributed solar photovoltaic resources not modeled as a resource selection in the RPM*. Solar PV systems are growing in popularity across the region as consumers look to reduce their greenhouse gas footprint and increase the resiliency of their individual systems. A recent study by the Pacific Northwest Utilities Conference Committee (PNUCC) reports, "[s]olar technology is becoming more affordable, which will contribute to increased development in the Northwest. The growing affordability is due to falling capital costs, falling installation costs, various incentives and leasing programs (which reduce the amount of upfront capital needed to install solar."[6] As of 2013, the Northwest had 13,949 distributed net-metered solar installations. Since 2013, residential solar installations have nearly doubled in Washington communities such as Bellevue, Edmonds, Kirkland, Mercer Island and Seattle. Solar still amounts to only 35 megawatts in the state but has been growing at a steady

[6] PNUCC, *Value of Northwest Distributed Solar* 2 (February 2015).

30% per year.[7] We recommend that the Council incorporate solar PV systems as a resource option in all model runs for the final plan.

6. *The Council's modeling of a region-wide 35% renewable portfolio standard*. This is perhaps the draft Plan's weakest element. This scenario does not remove existing coal generation from the system and significantly overbuilds the electric system by adding new renewables in addition to running existing coal and gas. Of course this results in unrealistically high costs. It misses the emissions reductions to be gained by replacing retiring coal plants with a combination of resources that includes substantial amounts of clean energy, including new renewables. Among the critical problems with this scenario:
    - It looks at 35% of regional load, not just the load of the largest (mostly investor-owned) utilities, meaning that new renewables are added to the system even when they directly compete with firm hydro in the region. In the past, RPS policies have been designed specifically to avoid this situation.
    - 35% of regional load amounts to 8,500 megawatts new renewables, doubling what the region has today. The scenario assumed that 5,500 megawatts of those 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.

    In short, this scenario was not carefully constructed to ask the important question of how renewable resources can most effectively contribute to a low-carbon, least-cost system. A more realistic renewables expansion scenario would be one in which (1) coal plants are retiring on an orderly basis, and (2) cost-effective renewables and associated measures are built to match system needs. On this basis, we recommend that the discussion of the 35% renewables scenario be removed entirely from the carbon dioxide emission sections of Chapter 3, Resource Strategies, and Chapter 15, Analysis of Alternative Resource Strategies. We further recommend that the discussion of this scenario, how it was constructed and the outcomes it produced, be clarified throughout the final 7th Plan.

One way to reconsider how cost-effective renewable resources can be bundled together with other resources and operational tools is to conduct a study on what it would take to run the grid reliably with the least amount of carbon dioxide emissions. A Northwest low-carbon grid study[8] would provide guidance and key data points for how the electricity sector in the Northwest could ensure adequate peaking capability, flexible resources and reliability services in a low-carbon grid future, at least cost to consumers.

We ask that the final plan include an action item to work with national modeling experts and a diverse group of stakeholders to conduct a low-carbon grid study in the Northwest.

The draft Plan makes clear that individual utilities may decide that their systems could require natural gas plants, despite the overall conclusion that the *region* does not. We suggest applying

[7] http://www.commerce.wa.gov/media/Pages/PressReleaseView.aspx?pressreleaseid=202
[8] http://lowcarbongrid2030.org

that same philosophy to the renewables results. It is quite possible that some individual utilities will find renewable resources meet their needs better than natural gas.

The Council also should continue to improve the model to analyze these resources in a systemic portfolio and integrated way for the midterm assessment and the 8th Plan.

V. Carbon dioxide emissions

The draft 7th Plan shows that the region's current investments in energy efficiency and renewables and the closed and soon-to-be-closed coal plants put the four Northwest states on track for a 35% cut in carbon emissions by 2035. The Council finds that the region could easily cut carbon emissions as much as 80% at a cost of $20 billion more than the Existing Policy scenario – not counting the health and climate benefits. However, we think that the draft Plan's price analyses are incomplete in many of the carbon reduction scenarios, resulting in higher costs than the region actually will face from implementing these resource strategies.

The first area of concern is the RPM's modeling of coal-fired resources. During development of the draft 7th Plan, the Coalition produced an analysis[9] pointing out that the Council's modeling approach inadequately represents the costs of maintaining existing coal-fired generation. This paper identifies three specific issues:

1. The RPM does not incorporate ongoing capital costs for existing coal-fired generating plants.
2. The supplemental analysis of coal capital costs fails to fully reflect those costs.
3. The analysis completely omits several coal generating units that serve Northwest customers and that Northwest families and businesses pay for in their electricity bills.

As a result of our analysis, Council staff reviewed our information on coal capital costs (point 2 above) and adjusted to some of the cost information. However, points 1 and 3 above have not been remedied in the draft Plan.

The Council's modeling does not incorporate coal generator capital costs, which leads to incomplete analysis of the cost of maintaining and operating these resources. The Council has released supplemental information on environmental costs associated with the coal plants but needs to include the costs directly in the model so they can be integrated effectively into all model runs.

Additionally, ignoring "out-of-region" coal plants' role in the region is an historical shortcoming of Council power plans. Strong operational, regulatory and policy ties between these out-of-region plants and the Northwest region demand including these resources in the planning process. These plants face hundreds of millions of dollars in costs to comply with environmental regulations, a portion of which will unavoidably be paid by Northwest bill payers. Clearly, these customers have a significant stake in the Council's decisions about resources lying outside Council's planning footprint; considering these resources and their environmental costs will create a stronger, more accurate power plan.

[9] The True Cost of Coal, http://www.nwenergy.org/data/True-Cost-of-Coal-NWEC_0715.pdf

The Council can build a more robust analytical process by more carefully considering these issues. Specifically, we urge the Council 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.

We recommend the Council modify its description of the role of natural gas in replacing coal and decreasing regional greenhouse gas emissions. The executive summary states, "Similarly, after energy efficiency, the increased use of existing natural gas generation offers the lowest cost option for reducing regional carbon emissions." This is true based on the Council's current total regional system cost model, but it is *not* the cheapest route to greenhouse gas reductions. Power system use of natural gas creates considerable emissions of methane, a very potent short-lived greenhouse gas, from escapement during production and transportation, and substantial amounts of carbon dioxide during combustion in power plants.

We believe the Coalition's clean energy strategy delineates a less expensive and less risky path for deeper cuts in greenhouse gas emissions, a path that should be recognized alongside the Council's total regional system cost findings.

The other issue of concern to the Coalition in the draft Plan discussion of carbon dioxide reduction policies is the use of the *Existing Policy* case as a reference case.

The name and use of this scenario are misleading because the scenario parameters do not reflect existing policy. This scenario does not consider how EPA's Clean Power Plan regulations will affect the Northwest electric sector. Although the CPP is a relatively new, it is wrong to assume it won't affect market price and generating resource factors in the Northwest within the 7th Plan timeframe. We strongly urge the Council to either (1) include likely effects of the CPP in this scenario or (2) 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.

VI. Electric grid improvements

The draft 7th Plan fails to fully integrate the set of tools and resources – which the Coalition describes collectively as *grid edge* -- for improving the electric grid. *Grid edge* refers to a location on the grid where the distribution system and the customer interconnect, where technology, policy and markets come together to create a two-way, digitally enabled local power network. The grid edge includes a set of interrelated and overlapping technologies and applications that allow utilities, and their customers, to better manage existing resources and more efficiently use and conserve electricity.

Some technologies, such as distributed solar panels and smart thermostats, generally sit on the customer side of the meter; some, such as energy storage systems at substations, sit on the utility side of the meter; and some, like smart meters, are truly on the edge. The grid edge is about to undergo a revolution -- advanced power electronics, metering, telemetry, distribution automation and network communications will unlock the potential for new dispatchable demand, rooftop

solar and other distributed generation, demand response, storage technology and grid management codes to coordinate an emergent, data-saturated environment.

The grid edge concept goes beyond moving from a one-way to a two-way power system, or from an electromechanical to a faster, cheaper, cleaner, and more resilient electronic grid. It also addresses the many challenges and risks accompanying the wave of innovation, the massive floods of data and rapidly growing system complexity. Careful coordination of new technologies, policy and markets at the grid edge is essential to reduce and avoid many types of risk. Grid edge technologies and approaches enhance reliability, improve resiliency, increase customer choice, provide economic stability in an economic sector plagued by volatile fuel costs, reduce environmental damage, and wring more overall value from the essential services provided by our regional power system.

As the Council completes the 7th Plan, it has the opportunity to keep the Northwest at the forefront of developing other grid edge energy technologies. The Council's challenge is to integrating the promise of these new technologies and systems when its model does not clearly include or analyze these elements. Though difficult to model, these "known and available" technologies must be considered for their cost-effectiveness and their potential for reducing risk for the region.

Based on our survey of grid edge programs, done with an eye toward those most appropriate to the Northwest, we believe grid edge solutions offer considerable value for the Northwest power system and represent a natural progression from previous plans. The final plan should include expanded discussion and inclusion of grid edge technologies and approaches for the region. The final plan should include recommendations to advance adoption of smart grid and storage technologies, and other grid edge approaches. Specifically, in this area the Coalition recommends the following improvements to the draft 7th Plan:

1. *Evaluation of costs and benefits of grid edge technologies.* The Council should conduct cost and benefit studies of grid edge technologies and prepare to include a more diverse set of technologies.
2. *Distributed resource planning (DRP).* Following the lead of the California PUC, the Council should consider developing a model process for distributed resource planning that enables linkages and gaps to be determined between bulk power and distribution system.[10]
3. *Develop forecasting methods.* Based in part on experiences from other regions, the Council should develop methods to forecast the effects of grid edge technologies on loads and resources and fully factor those forecasts into the plan.
4. *Mid-course review.* Because the technology is evolving so rapidly, and because new information is being gathered, the Council should consider evaluating the role of grid edge technologies as part of a mid-plan review.

VII. Fish and wildlife

Nearly 35 years after the Northwest Power Act mandated equal treatment for fish and power generation in the Columbia-Snake system, 13 of the basin's wild salmon and steelhead stocks are

[10] http://www.cpuc.ca.gov/PUC/energy/drp/

still listed under the Endangered Species Act. Several remain at high risk of extinction; altered river flows and warming waters wrought by climate change will continue to exacerbate their plight. At the same time, as the dams in the federal hydrosystem age, their maintenance costs are ballooning.

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. The power system costs comprise a critical piece of the larger question about salmon restoration. Necessary to that calculation are the often-overlooked cost *savings* associated with dam removal. Ongoing operations and maintenance outlays, river channel dredging, fish transportation and bypass facilities, many parts of the Lower Snake River Compensation Plan and, most significantly, expensive turbine rehabilitation and system improvement costs would be avoided if the lower Snake River dams were removed.

The Coalition prepared an initial report looking at the power cost equation.[11] Our analysis finds a roughly $340 million increase in power system costs from removing the dams, which translates to a residential bill increase of about $1 per month. However, more in-depth analysis is needed and we recommend the Council undertake this study after the completion of the 7th Plan.

Consequently, we recommend that the Council undertake a new analysis of power system costs and savings associated with lower Snake River dam removal. 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 IPCC's Fifth Assessment Report and other scientific sources into its hydroelectric generation analysis as soon as they are available (estimated 2016).
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. The Council also should assess new findings on hydrosystem costs from all credible sources. These updated dam retention costs should be included in the analysis.

VIII. Climate change

We strongly encourage the Council to continue to improve its ability to model the physical effects of climate change on the region's power system. Appendix M addresses how this has been done to date and concludes, *"the physical effects of climate change have no effect on the resource acquisition or actions identified in this plan over the next six year period*."

Failure to adequately account for climate-related changes to the RPM model inputs results in an analysis that is less accurate at predicting future conditions. For example, temperature data affect winter and summer peaking estimates; rising summer temperatures may increase the summer peaking resource needs faster than under current model assumptions. This could lead to a dominant summer peak in the region, potentially changing the fundamental resource strategy conclusions. The Council should review and improve all inputs to the RPM analysis including stream flows and resulting hydropower generation supply curves, temperature profiles and the resulting effect on load forecasts, as well as other relevant portions of the model assumptions.

[11] *Restoring Wild Salmon*, http://www.nwenergy.org/data/Restoring-salmon.pdf

IX. Environmental methodology

During the initial stages of draft 7th Plan development, the Council released for comment a draft of the environmental methodology. The Coalition submitted extensive comments including a particularly critical issue that remains under-addressed in the draft 7th Plan: quantifying the environmental (non-energy) benefits from resources, particularly energy efficiency resources.

The plan evaluates energy efficiency resources on a total resource cost (TRC) basis as a result of the comprehensive definition in the Northwest Power Act. One reason the TRC test has proven so useful is that it addresses cost-effectiveness from a broad perspective, helping to determine whether the benefits of conservation outweigh the costs for the entire service territory. This allows energy efficiency resources to be evaluated alongside supply-side resources.

To be most accurate, the TRC must properly account for both the cost of energy efficiency measures as well as all of its benefits to participants. The Regulatory Assistance Project and others have found that the TRC frequently fails to account for all measure benefits, thus providing skewed and misleading results that tend to undervalue efficiency. These non-energy benefits, also referred to as "other program impacts" (OPIs), can be difficult to quantify.

Although the Council has sought to include all quantifiable benefits, we know the current equations are missing significant benefits. The Coalition strongly supports efforts to quantify known benefits.

The Council's recent wood smoke study is one example of the kind of groundbreaking work that the 7th Plan's environmental methodology should strongly support. We encourage the Council to document in the final plan how it is accounting for environmental benefits associated with energy efficiency resources. Further, we encourage adoption of action item ANLYS-8 in the final plan to continue the progress made through the wood smoke study and determine methods for the quantification and inclusion of non-energy benefits in energy efficiency total resource calculations.

X. Coordination with other regional planning

We commend and strongly support the draft Plan's focus on emerging opportunities for collaboration with other planning processes in the Pacific Northwest and the Western Interconnection. The inclusion of Chapter 18, Coordinating With Regional Transmission Planning, is particularly welcome, along with action plan items COUN-8 (participate in and track WECC activities), COUN-9 (monitor regional markets and marketing tools that affect power system dispatch), ANALYS-23 (coordinate with regional transmission planners) and ANALYS-24 (Transmission Expansion Planning Policy Committee (TEPPC)).

The need for improved coordination across power, transmission and climate planning processes will only grow in coming years. The Council has quietly and steadily increased its participation in the above venues and others. The Council's expertise and considerable modeling resources can contribute in a concrete way to finding mutual opportunities across the Western region and the Northwest specifically to move rapidly toward the reliable, clean and affordable power system envisioned by the Northwest Power Act.

XI. Conclusion

We conclude our comments by expressing our appreciation to staff and the Council for running a plan development process that was open, transparent and inclusive. Thank you for this opportunity to comment on the draft 7th Plan. The Coalition is providing a redline version of Chapters 1-3 and 15 for your consideration along with these comments.

Sincerely,

/s/Wendy Gerlitz

Wendy Gerlitz, Policy Director
NW Energy Coalition