

# Sixth Power Plan Action Plan

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## INTRODUCTION

The action plan describes things that need to happen in order to implement the Council’s Sixth Power Plan. It focuses on the next five years and the priorities in the plan. Actions are organized by resource areas, Bonneville Power Administration, and Council monitoring activities. In many cases, the action plan suggests the entities that have primary responsibility for implementation activities.

## CONSERVATION

*Energy efficiency is the first priority resource in the Northwest Power Act. The Council’s analysis for the Sixth Power Plan strongly affirmed that energy efficiency improvements provide the most cost-effective and least risky response to the region’s growing electricity needs. Further, accelerated acquisition of cost-effective efficiency reduces the contribution of the power system to greenhouse gas emissions. With greenhouse gas reduction policies in flux, and many new sources of carbon-free electricity expensive or lacking capacity contributions to go with their energy, accelerated acquisition of cost-effective efficiency can buy time to develop policies and identify alternative sources of carbon-free generation.*

*The region is increasing its efforts to accomplish conservation through integrated resource planning requirements, state and utility programs, and the Northwest Energy Efficiency Taskforce. Nevertheless, achieving the level of conservation identified in the Sixth Power Plan is a task that will require aggressive actions by the region. The action plan of the Sixth Power Plan contains a list of recommendations that will help the region to meet the efficiency challenge.*

*Key areas for enhanced implementation activity include: (1) enhancing the region's ability to acquire the identified efficiency potential; (2) increasing efforts to identify and verify new cost-effective and feasible technologies; and (3) developing regional mechanisms to keep efficiency policies up to date with changing information, track and verify achievements, and adaptively manage regional efficiency acquisition strategies.*

## ***Deployment***

**CONS-1. Achieve the level of conservation resource acquisition identified in the Sixth Power Plan's conservation target and accomplish the other actions necessary to accelerate conservation deployment.** [Utilities, Energy Trust of Oregon, Utility Regulators, Bonneville Power Administration, Northwest Energy Efficiency Alliance (NEEA), and States]<sup>1</sup> The Council target for regional acquisition of conservation over the first five years of the plan is 1,200 average megawatts. Consequently, activities, resources and budgets should be geared to acquire 1,200 average megawatts of savings from 2010-2014 from utility program implementation, market transformation efforts, and codes and standards not included in the regional load forecast. However, the Council recognizes that there is a level of uncertainty inherent in its assessment of regional conservation potential, the pace of anticipated economic recovery, power market conditions, carbon control requirements, technology evolution, the success or failure of acquisition mechanisms and strategies, progress on research and development, and the adoption of codes and standards. This means that the total amount of targeted conservation available in the first five years is uncertain. For this reason, the Council developed a range of likely conservation savings over the first years of 1,100 to 1,400 average megawatts. The Council will monitor the actual conservation savings acquired by the region by conducting reviews of the region's progress each year during the initial five-year planning horizon of the Sixth Power Plan. More specifically, CONS-16, calls for a mid-term review of regional progress toward the regional conservation target. This will permit the Council to consider adjustments to its regional conservation target for the remainder of the period covered by the action plan. In addition, the mid-term review will assess the impact of the region's progress on the acquisition of other resource development actions.

**CONS-2. Develop and implement an action plan for measures that are commercially viable but relatively new to programs or markets.** [Bonneville, Utilities, Energy Trust of Oregon, and NEEA] The Sixth Power Plan identifies new or technologically improved efficiency measures that are cost-effective to pursue. The plan identified nearly 6,000 average megawatts of cost-effective conservation realistically achievable over 20 years. Of that, approximately 2,500 average megawatts will require new initiatives, programs, market transformation efforts or progress toward adoption in codes and standards. While in the near term these measures make up about one-quarter of the conservation targets, activities to develop these measures need to start now so the region is positioned to place increased reliance on them in the future. The Council believes that regional collaboration on initiatives to develop and deploy these measures would greatly enhance their chance of success. This activity will require concurrent market research to determine the most effective ways to develop and deploy these new measures. Each of these measures is at a

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<sup>1</sup> Format note: The text in brackets following the bolded actions identifies the implementing entities.

different stage of development and requires a different implementation strategy. All require efforts beyond what is now being done. An initial list of these measures includes distribution system efficiency, commercial outdoor lighting, residential heat-pump water heaters, residential ductless heat pumps, TV, set-top boxes, desktop PCs, PC monitors and industrial system optimization.

**CONS-3. Provide continued funding, in adequate amounts, for the Northwest Energy Efficiency Alliance's (NEEA) to support its market transformation efforts.**

[Bonneville, Utilities, and Energy Trust of Oregon] NEEA's regional market transformation activities have proved to be a great value. Market transformation has been a key part of the development of many existing efficiency initiatives, and will need to be so for many of the new initiatives that the region must take up.

NEEA's newly adopted strategic plan should be funded by regional utilities. In addition, the region should institute an ongoing process to identify needed market transformation efforts that are not in the current NEEA business plan but which may be necessary to reach regional conservation targets. The process should include a mechanism, such as subscription-based initiatives, to adjust funding allocations between regional and local programs as market dynamics change and new opportunities arise.

**CONS-4. Develop long-term partnerships with energy efficiency businesses, trade allies and other parties in product and service supply chains.** [Bonneville, Utilities, Energy Trust of Oregon, NEEA, Governors, and States] Decisions to adopt efficiency measures and practices are made by consumers. Consumer's decisions are influenced by many factors, including relationships with the energy efficiency industry and trade allies such as building designers, equipment vendors, contractors, engineering firms, lighting designers, and the product and service options available to them. Accelerating consumer adoption of energy-efficient technologies and practices can be facilitated by creating cooperative working relationships between NEEA and utility programs, product manufacturers, distributors, retailers, and the energy efficiency industry and trade allies to leverage their market relationships.

**CONS-5. Support the adoption of cost-effective codes and standards and work to help ensure compliance.** [Council, Utilities, Energy Trust of Oregon, NEEA, Bonneville, Governors and States] The Council will encourage the adoption of new codes in the region by working closely with the governors' offices and with the responsible energy code adoption and enforcement agencies and other regional entities. This includes, but is not limited to the following activities:

- Advocating for the development and adoption of cost-effective energy codes and equipment and appliance standards at the state and national level in a manner that is consistent with the entities' roles in the acquisition of efficiency resources and legal limitations on political activities.
- Providing technical and political leadership in both legislative and rulemaking processes.
- Enhancing code compliance by working with local government officials to create a supportive environment and adequate funding for comprehensive energy code implementation.

- Providing technical and educational support to code-enforcement staff.
- Developing and implementing a coordinated, high-level, adequately funded Pacific Northwest presence in federal efficiency standard rulemaking processes, to ensure that efficiency standards for federally regulated appliances and equipment achieve cost-effective energy savings.

**CONS-6. Implement the Sixth Plan's Model Conservation Standards (MCS).** [utilities, Energy Trust of Oregon, NEEA, Bonneville, governors and states] This includes supporting the adoption of the MCS in state codes and standards and working with local jurisdictions to increase compliance rates. It also includes implementing programs to achieve savings from measures in the MCS not adopted into code and operating programs consistent with the MCS for conservation programs not covered by other MCS.

**CONS-7. Adopt policies that encourage utilities to actively participate in the processes to establish and improve the implementation of state efficiency codes and federal efficiency standards in a manner that is consistent with their responsibility to acquire cost-effective efficiency resources.** [utility regulatory commissions] For example, state regulators could clarify conditions under which utilities could qualify for cost recovery for efforts to establish new codes and standards.

**CONS-8. Support the ongoing operation of the Regional Technical Forum (RTF) and assure that the RTF has sufficient resources to review the new efficiency measures identified in the power plan.** [Bonneville, utilities, Energy Trust of Oregon, and states] The financial resources provided to the RTF's to support its review of energy savings estimates, development of measurement and verification protocols, and establishment of measure specifications needs to be enhanced to cover the expanding suite of conservation activities. In order to avoid delaying the acceleration of regional conservation acquisition efforts the RTF will require increased funding to carry out its reviews in a timely and thorough manner. The region should provisionally increase its support of the RTF in 2010 at a level commensurate with estimated cost of identified research, analysis, tracking and evaluation while the Northwest Energy Efficiency Taskforce (NEET) conducts a review of the RTF's function, role, funding, and governance. Upon completion of the independent review, NEET should submit its recommendations regarding these issues to the Council for consideration.

**CONS-9. Develop energy savings verification protocols for conservation measures, practices, and programs when current verification methods appear problematic or expensive or verification methods do not exist.** [Regional Technical Forum] Streamlined measurement and verification protocols will allow the region to monitor the reality and persistence of savings as well as help Bonneville, the utilities, and regulators identify savings against targets and goals. The RTF should work with utilities for consistent guidance on tracking and verification of savings. Pursuant to CONS-17, the RTF should develop measurement and verification protocols and/or recommend mechanisms for savings evaluation and verification that recognize the limited capabilities, customer and service territory characteristics and experience of the region's small and/or rural utilities. The RTF should prioritize its work to allow the region to move forward quickly to capture and verify savings. The RTF should also recommend

improvements to the regional conservation measurement and evaluation procedures based on recommendations from the NEET workgroup as a starting point.

**CONS-10. Develop a comprehensive library of estimates of savings from conservation measures and savings evaluation and measurement protocols.** [Regional Technical Forum] Review and compare utility and Energy Trust of Oregon savings estimates for measures not addressed by current RTF recommendations. Expand and update the library of energy savings estimates, over time resolve any inconsistencies, and make the library available for use across the region. Pursuant to CONS-17, in consultation with Bonneville and the region's small and/or rural utilities identify conservation measures that recognize the limited capabilities, customer and service territory characteristics and experience of the region's small and/or rural utilities.

**CONS-11. In recognition of the higher goal for industry-sector conservation, develop and implement a comprehensive strategy to improve the energy efficiency and economic competitiveness of industries in the region.** [industry and trade allies, Bonneville, utilities, Energy Trust of Oregon, NEEA, and states]

**CONS-12. Consistent with standard practices for integrated resource plans, establish policies for incorporating a risk-mitigation premium for conservation in the determination of the avoided cost used to establish the cost-effectiveness of conservation measures.** [state utility regulatory commissions and utilities] The Council's resource portfolio modeling identified valuable risk-mitigation benefits for the region from developing conservation. A risk-mitigation value should be incorporated into conservation cost-effectiveness methodologies used by utilities and their regulators and system benefits administrators. The Council recognizes that each utility and system benefits administrator is in a different position with regard to the risks it faces. Regulators and utilities should establish policies on how to incorporate the estimated cost of addressing greenhouse gas emissions from thermal resources in conservation avoided-cost methodologies and integrated resource plans.

**CONS-13. Identify regulatory barriers and disincentives to the deployment of conservation, and consider policies to address these barriers.** [state utility regulatory commissions, investor-owned and publicly-owned utilities, states, BPA and others] Responsible organizations should identify barriers to achieving efficiency improvements. Some policies to reduce barriers will be addressed through the Northwest Energy Efficiency Taskforce. Others may be addressed by individual utilities. The Council will work with regional interests to evaluate the use of prices and incentives to encourage the achievement of conservation targets. If some utilities are having difficulty achieving the efficiency targets in the plan, they should consider pricing structures, including the use of inverted block rates, to provide better incentives to their customers to improve the efficiency of their homes and businesses.

## *Adaptive Management*

The Council is well positioned to conduct periodic reviews of the remaining conservation potential, and of existing and planned conservation initiatives as well as conservation research and evaluation efforts. However, Bonneville, the utilities, the Energy Trust of Oregon, and

NEEA, along with the states are best positioned to develop and adaptively manage the actual acquisition of conservation resources. These entities have a long and successful history of developing strategies and funding programs to acquire conservation, transform markets, and upgrade codes and standards.

**CONS-14. Prepare a strategic and tactical plan to achieve the Sixth Power Plan's regional conservation target and accomplish the other actions that are necessary to build the capability to accelerate conservation deployment for the remainder of the planning period in a cost-efficient manner.** [Bonneville, utilities, Energy Trust of Oregon, and NEEA] A regional conservation implementation plan is needed to assure resources are being effectively deployed to reach the Sixth Power Plan's conservation target. The Council recognizes that Bonneville, utilities, Energy Trust of Oregon, and NEEA are best positioned to prepare and adaptively manage the implementation of such a plan. However, the development and implementation of this plan will require the active collaboration of these entities with other market actors, including energy-efficiency business and their trade allies, state and local governments, as well as associations and organizations that represent key customer groups. The Council believes that the plan should include specific actions focused on developing energy-efficiency technologies and practices. The plan should describe how these technologies and practices will be brought to market from conception to full deployment using local utility programs, coordinated regional programs, market transformation, codes and standards adoption and enforcement and any other mechanism deemed appropriate and all parties should collaborate on the disaggregation of these savings into these delivery categories. In particular, the plan should address the need to transition from reliance on compact fluorescent light bulbs (CFLs) to a more diversified portfolio of measures. Savings achieved through all of these mechanisms, including savings for utility-acquired CFLs until federal standards take effect in 2012, will count toward achievement of the Council's conservation target. The plan should also set forth the level of funding for staffing and infrastructure needed for its successful implementation. Finally, the plan should develop quantifiable milestones to measure progress toward these targets and actions that can be evaluated at strategic points over the five-year action plan. Progress toward these milestones should be reviewed in the mid-term report on progress toward meeting plan objectives (CONS-16).

**CONS-15. Develop an ongoing mechanism to identify high-priority actions that will enhance the deployment of cost-effective energy efficiency across the region.** [Bonneville, Utilities, Energy Trust of Oregon, NEEA, State Regulatory Commissions, along with the States and the Council] Adaptive management of the implementation of the regional conservation action plan called for in CONS-14 will require timely decisions regarding the allocation of resources between local, regional programs and market transformation initiatives; the continuation and expansion of successful existing programs and efforts; the modification or termination of poorly performing programs, and the development of new initiatives for new efficiency measures and practices identified in the Sixth Power Plan. In order to accomplish this, the Council believes that a high-level forum for ongoing policy-level guidance on these issues should be formed. The Council views this as a continuance of the NEET efforts to address the dynamic nature of conservation acquisition and, like NEET, this forum must include senior-level management and decisionmakers to assure common understanding, commitments, and follow-through. While pursuant to the NEET recommendations NEEA has agreed to host

and facilitate regional efforts to better coordinate programs that do not adequately address this need.

**CONS-16. Report on progress toward meeting plan objectives.** [Bonneville, utilities, Energy Trust of Oregon, and NEEA] As part of the Council’s biennial review of the Sixth Power Plan, Bonneville, Utilities, Energy Trust of Oregon, and NEEA should report on progress toward meeting the plan’s conservation targets and objectives. The report should include an assessment of progress toward mid-term milestones established in the strategic plan developed in CONS-14. The Council recognizes that the plan’s conservation targets are based on an “expected value” across a wide range of potential futures. The actual future the region experiences will differ in some regard from the plan’s assumptions. Therefore, this report should identify whether the regional conservation acquisition plan (CONS-14), the implementation of that plan (CONS-15) and/or the Council’s target (CONS-1), need to be modified to account for conditions or circumstances different than expected. These include slower- or faster-than-anticipated economic recovery, substantially different power market conditions, carbon control requirements, technology evolution, the success or failure of acquisition mechanisms and strategies, progress on research and development and the adoption of codes and standards.

**CONS-17. Take into account the unique circumstances and special barriers faced by small and/or rural utilities in achieving conservation and the development and implementation of conservation programs.** [Bonneville] Work with and give assistance to these customers to ensure that their capabilities, customer and service territory characteristics, and experiences are addressed in the identification of conservation measures applicable in their service territories and in the implementation of these conservation measures. Work with the RTF to see that these measures are expeditiously evaluated so that they are available to meet the conservation goals of small and/or rural utilities. Assist these utilities as needed in their efforts to implement these conservation measures and help Bonneville meet its share of the regional conservation target, working with these utilities either individually or pooled, as appropriate in each circumstance. Finally, a panel consisting of Bonneville and small and/or rural utilities should report its findings back to the Council during the mid-term check-in of the Sixth Power Plan.

**CONS-18. In consultation with Bonneville, utilities, Energy Trust of Oregon, and NEEA develop recommendations on measure bundling, the use of cost-effectiveness tests, research and development investments, and other issues.** [Council] Guidance is needed to ensure that the Sixth Power Plan’s conservation resource assessment is translated into acquisition programs and research and development activities. The NEET process identified the Council as the lead for the development of a cost-effectiveness reference document and the need for an ongoing process to assist utilities and others in their efforts to design, implement, and administer an effective and efficient conservation program using the data from the Council’s plan.

**CONS-19. Develop and implement improvements to the regional conservation planning, tracking and reporting (PTR) systems so that energy efficiency savings and expenditures are more consistently and comprehensively reported.** [Regional Technical Forum, utilities, Energy Trust of Oregon, Bonneville, NEEA, and states]

Also identify a governance structure to guide improvement of the systems and funding agreements to share the responsibility for its ongoing operation and maintenance equitably. The tracking system should evolve over time so that conservation from all mechanisms and funding sources, including utility, state and local conservation programs, codes and standards, state and federal tax credits, market transformation, and non-programmatic changes in markets can be reported. Savings from market changes outside of programs may need to be tracked outside of the PTR system.

## *Development and Confirmation*

The Sixth Power Plan's assessment of technically achievable energy efficiency resources relies on research and demonstration program results initiated as long ago as the early 1980's. In order to expand the conservation options available in the future, and to confirm the resource cost, savings, and consumer acceptance of some measures identified in the plan, the region should fund conservation research and demonstration activities. The responsibility for carrying out these activities varies with their purpose and scope. However, given the "community property" nature of the results of these projects, Bonneville, the utilities, NEEA and the Energy Trust of Oregon should, to the extent practicable, collaborate on funding and coordinate on implementation. At the same time, regulatory commissions should establish guidelines to allow cost recovery for such research and demonstration activities.

**CONS-20. In order to ensure the long-term supply of conservation resources, develop and fund a regional research plan that directs development, demonstration, and pilot program activity.** [utilities, Bonneville, Energy Trust of Oregon, NEEA and other program operators] The plan should focus on both the new measures and practices identified in the Sixth Power Plan conservation assessment and promising measures that emerge over the next five years that require additional technical, market, or other research. An initial list of measures that should be incorporated into the research plan is in an attachment to Appendix E. Assess feasibility, collect and evaluate data on costs and savings (including load-shape impacts), and identify programmatic approaches, delivery mechanisms, implementation strategies, and infrastructure needs. The research plan should :

- a. Prioritize research needs based on the magnitude of potential savings and level of uncertainty of measure performance.
- b. Identify research objectives that define specific milestones or the knowledge sought in order to increase certainty and solidify resource components of the long-term conservation supply.
- c. Identify funding requirements and commitments to accomplish research objectives.
- d. Assign the roles and responsibilities of the various regional entities, including but not limited to the Regional Technical Forum, Bonneville, NEEA, utilities, Energy Trust of Oregon, and the states.
- e. Identify milestones for reviewing research progress, determining additional research needs, and determining how regional conservation potential and associated targets should be adjusted based on the findings. Periodic review of the research plan and findings could be done as part of a biennium review of the power plan, or as needed.



**CONS-21. Develop a regional approach to support data needs for energy efficiency.**

[Bonneville, NEEA, utilities, Council and Regional Technical Forum] The region should develop a multi-year data collection and research plan that prioritizes the initiatives needed to facilitate the implementation of conservation resources and determine their impact on the power system. The plan should set forth a process to improve data coordination, distillation, and dissemination and outline the most appropriate and cost-efficient way to acquire needed data. The development of this plan should be carried out in a manner consistent with the NEET recommendations. Elements of this data collection work can assigned to the Regional Technical Forum, NEEA, Bonneville, and the utilities. High priority data needs include:

- a. Residential and commercial building characteristics
- b. Customer end-use surveys
- c. Measured end use & savings load shapes
- d. Efficiency measure saturations
- e. Capacity impact of efficiency measures
- f. Appliance and equipment saturations
- g. Market/Supply Chain structure
- h. Tracking of non-programmatic conservation savings

**CONS-22. Establish guidelines to consider balancing utility and consumer interests, cost recovery for conservation research, demonstration, confirmation, and coordination activities.** [state utility regulatory commissions, public utility boards and commissions, and utilities]

## GENERATING RESOURCES

From a regional perspective, actions to develop new generating capacity in excess of that needed to meet state renewable portfolio standards is unlikely to be needed within the next five years for purposes of energy adequacy, risk reduction or cost reduction. Individual utilities, however, may need to acquire energy generation capacity because of transmission or other limitations that constrain access to energy markets and surplus generation, or because of a need to reduce market price, fuel price or carbon exposure. The action plan includes guidelines for energy acquisitions in these circumstances.

Though the summertime surplus of firm capacity is declining, actions to develop additional firm capacity are not needed on a regional basis over the next five years to maintain adequate winter or summer peaking reserves. As with energy, individual utilities may require additional firm capacity to maintain adequate reliability reserves.

Continued development of wind power to meet regional renewable portfolio standards and for export<sup>2</sup> will continue to increase the demand for flexibility reserves.<sup>3</sup> This action plan includes actions to reduce the demand for system flexibility and to more fully access the latent flexibility

<sup>2</sup> Bonneville and other balancing authorities are obligated to provide interconnection and integration services for generators irrespective of local need.

<sup>3</sup> Flexibility reserves (also called balancing reserves, rapid-response reserves, or regulation and load-following capability) provide the ability to balance generation and load on a sub-hourly basis. Balancing within intervals of seconds to minutes is referred to as regulation. Balancing within the hour is referred to as load following.

of the existing system. These actions are high priority and are consistent with the recommendations of the Northwest Wind Integration Forum.

Even with implementing measures to enhance existing system flexibility, growing wind and other variable-output resources may require augmenting flexibility reserves. Though the timing of this need on a regional basis is not well understood, Bonneville has asserted this may happen within several years because of the geographic concentration of wind development within its balancing area. The action plan includes actions to develop and implement a system to monitor the regional flexibility adequacy and guidelines for acquisition of balancing reserves.

Utilities that need to acquire new low-carbon emitting resources should consider the economic and environmental costs of the balancing reserves to firm and shape this variable-output generation, as well as the economic and environmental costs of the transmission facilities to integrate such resources.

The action plan includes actions to improve the cost-effectiveness and commercial availability of emerging low-carbon generating resources and storage alternatives with a focus on options of special relevance to the Northwest. Prospects include enhanced geothermal, wave energy, offshore wind, advanced and modular nuclear plants, solar photovoltaics, imported wind, concentrating solar power, tidal current energy, and technologies to capture, store or recycle carbon from existing and new fossil-fueled power plants. Technologies such as pumped storage, compressed air storage, batteries, and “smart grid” technologies offer low-carbon approaches to augment system flexibility.

Sound power system planning requires capable analysis tools and reliable supporting data. In particular, techniques and data to assess the most cost-effective approaches to develop and integrate variable-output resources long term are inadequate or lacking. This action plan contains actions to support improved planning and decisionmaking.

## ***Generating Resource Acquisition***

### **GEN-1. Acquisitions to meet energy, capacity, and ancillary service needs.**

Bonneville, other balancing authorities, and utilities needing to acquire resources to provide energy, capacity or ancillary services should seek to acquire the most cost-effective, suitably reliable resources available to provide the needed service. All potentially cost-effective alternatives capable of providing the needed services should be considered including, but not limited to, conservation, demand management, storage, transmission, generating resources, operational and institutional solutions, and other emerging technologies (for example smart grid technologies). Resource acquisition decisions should recognize the full value of services (e.g. energy, capacity, ancillary services, avoided transmission and distribution costs, cogeneration load) provided by the available alternatives (e.g., and the full cost of services needed to support the available alternatives (e.g., costs of transmission, balancing services, and supplemental firm capacity). Significant investment, performance, environmental, and other risks should be quantified where feasible.

### **GEN-2. Facilitate development of smaller-scale, cost-effective, low-carbon resources.**

Generating resource development in recent years has been dominated by wind power and

natural gas combined-cycle plants. However, smaller-scale renewable and high-efficiency projects can be equally, if not more, cost-effective than these more prevalent resources. Smaller-scale resource development opportunities include waste heat energy recovery, bioresidue energy recovery, cogeneration, geothermal, hydropower upgrades and new hydropower projects. These opportunities are available in limited quantity and can be challenging to develop because of the complexity of business and fuel supply arrangements; costly or unique engineering, interconnection and other infrastructure requirements; and proportionally high transaction costs and long lead times. Design and engineering is often highly site-specific, as are costs and business arrangements. If successful, however, these projects can provide firm capacity, base load energy, avoided transmission and distribution costs, residue disposal solutions, local economic benefits, low-carbon energy production, and revenues to host facilities.

The Council encourages Bonneville and the utilities to facilitate development of these resources where cost-effective by activities such as the following:

- Surveying resource development potential
- Structuring requests for proposals to accommodate small and diverse projects
- Establishing “open windows” for unsolicited proposals
- Establishing standard power purchase offers for qualifying projects
- Establishing standard interconnection provisions
- Considering all project attributes in proposal evaluations
- Providing financial, engineering and other development assistance
- Supporting demonstration and pilot projects for developing, testing and demonstrating technologies and business practices with potentially widespread application

### *Adequacy of System Integration Services*

GEN-3. **Reduce demand for system flexibility.** The demand for balancing reserves for integrating variable-output resources can be reduced by improved wind forecasting, sub-hourly scheduling, liquid intra-hour wholesale power markets, curtailment of wind plant output during severe ramp-up events, curtailment of wind export schedules during severe ramp-down events, and ACE<sup>4</sup> diversity sharing among balancing areas. Bonneville and other balancing authorities and grid entities should assess the feasibility, cost and benefits of these and other measures to reduce the demand for balancing reserves and implement promising measures.

GEN-4. **Expand access to existing system flexibility.** The balancing capability of the existing power system is not fully available because of business practices, operating protocols, transmission and communication limitations, absence of equipment allowing plants to be operated for balancing purposes, and environmental constraints. This latent balancing capability can be more fully tapped by expanded dynamic scheduling capability within the region and between interconnected regions, and by retrofit of existing plants where feasible and if necessary to provide balancing capability. Bonneville, other balancing authorities, grid entities, and plant owners should assess the

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<sup>4</sup> Area Control Error - A measure of the instantaneous difference in scheduled and actual system frequency and a balancing authority's scheduled and actual interchanges with other balancing areas.

feasibility, cost, and benefits of expanded dynamic scheduling within region and across the Northern and Southern interties. Attractive opportunities for expansion should be developed.

**GEN-5. Assess adequacy of system flexibility.** Periodic assessments of the adequacy of available balancing capability for following load and for variable-output generating resource integration are needed to complement to existing assessments of energy and capacity adequacy. The Wind Integration Forum, working with the Resource Adequacy Forum should develop a metric and methodology for evaluating the balancing reserve adequacy. Regular assessments of the adequacy of balancing capability should be implemented once the metric and methodology have been developed and tested.

**GEN-6. Evaluate flexibility augmentation options.** This plan recommends developing wind and other renewable resources to offset carbon and natural gas price risks. Adding wind and other variable-output resources will continue to expand the need for balancing capability. In response, priority should be given to measures to reduce the demand for balancing reserves and measures to expand access to the latent flexibility of the existing system, as called for in GEN-3 and GEN-4. However, Bonneville and other balancing authorities may eventually need to augment the supply of balancing capability to serve the expanding inventory of variable-output resources. The Council, working with the Wind Integration Forum and others, will assess the availability, reliability, and cost-effectiveness of resources for augmenting the existing balancing capability of the power system. Priority in this effort will be given to resources or combinations of resources that can jointly satisfy peak-load and system-flexibility requirements. This effort will consider, but not be limited to, combined-cycle plants, gas turbine generators and reciprocating engines, compressed-air energy storage, pumped-storage hydro, battery storage, smart grid technologies, and demand-side options. Metrics should be developed to measure and compare the various options. The completed assessment should identify research, development, and demonstration activities to ensure that the most promising options are available when required.

**GEN-7. Commercialize and confirm low-carbon resources with special Northwest promise.** Wave energy, deep-water wind power, enhanced geothermal power generation and salinity gradient energy systems have promise for future development in the Northwest as potentially abundant, low-carbon resources. Yet these resources, together with tidal current generation, are technically immature and the benefits, costs, and consequences of commercial-scale development insufficiently understood. Bonneville, regional utilities, industry groups, and the states, working with the federal government, should initiate and support efforts to develop and demonstrate the relevant technologies. They should also work to establish the body of knowledge and legal framework to support commercial development of the resources when available and needed. These efforts should include: 1) measuring the resource using a sufficient geographic scope, frequency, and duration to assess the economics of the resource, identifying promising resource areas and assessing resource integration needs; 2) technology assessment; 3) identifying and resolving potential environmental, economic, and other development conflicts; 4) demonstration projects to test and evaluate technology; 5) assessing system integration needs; and, 6) pilot projects to serve as the basis for commercial development.

The Oregon Wave Energy Trust initiative is a comprehensive model resource-confirmation effort.

**GEN-8. Carbon separation and sequestration technologies.** Though not yet fully commercial, carbon separation, sequestration, and recycling may prove to be an economic approach to reducing carbon dioxide releases in the long term. The Council encourages states and utilities to support efforts to develop commercial technologies for separation, sequestration, and recycling of carbon dioxide with emphasis on technologies unique to Northwest situations such as flood basalt sequestration. The Council also encourages the states to establish the legal framework for permitting and operating carbon dioxide transportation and sequestration facilities.

**GEN-9. Monitoring development of other promising resources and technologies.** Commercial development of other promising technologies is likely to be promoted primarily by policies, incentives, and other drivers at the federal level, or within other countries or regions where the technology might play a particularly vital role. These technologies include post-combustion carbon dioxide capture from conventional fossil-fuel power plants, algae-derived biofuel production and other carbon dioxide “recycling” technologies, integrated coal gasification combined-cycle technology, advanced nuclear technology, carbon dioxide sequestration in saline reservoirs and depleted gas and oil fields, and concentrating solar thermal and photovoltaic technologies. While active participation of the Northwest utility industry in developing these technologies may not be needed, their development should be closely monitored, and joint participation in demonstration projects and other resource development efforts should be considered. In addition, the Council expects that the strong energy research and development organizations present in the Northwest will participate in developing these technologies.

**GEN-10. Resource development mandates and incentives.** A diverse collection of federal and state resource development mandates and incentives has developed over time. Their underlying public goals include commercializing immature, but promising, technologies, developing the power system and social infrastructure to support commercial-scale development of promising resources, economic development, and promoting development of low-carbon resources. While these mandates and incentives are effectively promoting development of specific resources, their focus on resource types rather than ends (e.g., GHG reduction, cost and risk minimization) may constrain development of equally attractive resources and affect efficient system operation. The Council, working with other interested entities will review the impact and effectiveness of mandates and incentives, including consideration of the following:

- a. **Impact on optimal resource dispatch.** The federal production tax credit and renewable energy credits lower the effective variable cost of generation, under some conditions to negative levels. Concerns have been voiced that this can result in inefficient resource dispatch, and in some cases, increased environmental impact.
- b. **Effects of an unbundled REC market.** Renewable energy credits (RECs) represent the environmental and renewable attributes of renewable energy production as a separate commodity from the associated energy. RECs can be

transacted as “fully bundled” (delivered with the associated energy), “partly bundled” (the associated energy can be delivered within a specified time), or “fully unbundled” (marketed separately from the associated energy). As states, particularly California, move toward more aggressive and challenging renewable portfolio standards, interest in meeting RPS requirements with partially or fully unbundled RECs has increased. Unbundling can expand the pool of qualifying resources available to utilities, and expand the customer base for developers of qualifying resources. Market flexibility and liquidity, less constrained by transmission considerations, should increase. Because the value of CO<sub>2</sub> reduction is not location-specific, greenhouse gas reduction benefits are preserved. Partly unbundled transactions will improve transmission load factors and the need for new long-distance transmission lines will be reduced. Local economic benefits will shift to areas rich in lower-cost qualifying resources. Unbundling, however, raises issues of concern to resource-rich areas such as the Northwest. The demand for, and cost of, balancing reserves in the supply region will increase. The need for equitable allocation and recovery of the cost of balancing services will become more acute. The residual (“null”) energy must be marketed within the supply region and may depress power prices and introduce additional volatility to the wholesale power market. Dispatch conflicts with minimum hydropower operating limits and must-run resources may increase. Finally, the cost of acquiring RPS-qualifying and other low-carbon resources may rise for Northwest utilities because of increased competition. The potential extent of the future unbundled REC market should be assessed, the resulting benefits and costs characterized and actions needed to remedy significant impacts identified.

- c. **Geothermal development risk reduction.** Geothermal is an attractive, competitive low-carbon resource. Geothermal development, however, is hampered by a financially risky resource exploration and confirmation phase. Current federal incentives that reward successful production may be insufficient to offset the investment risk of resource development. Earlier federal incentives intended to offset resource exploration and development risk resulted in substantial geothermal power development and production. The cost and effectiveness of a range of incentives should be assessed to determine what set of incentives appear to be the most cost-effective in stimulating productive geothermal development.
- d. **Promote CO<sub>2</sub> reduction parity of resource mandates and incentives.** The principal underlying public purpose of many resource mandates and incentives is to reduce greenhouse gases, yet CO<sub>2</sub> reduction potential is not always reflected in the structure and level of mandates and incentives. An example is the prevalent failure to equate the carbon dioxide reduction potential of energy efficiency with that of renewable generating resources in state renewable portfolio standards. This may result in overly costly carbon dioxide reduction and a greater environmental impact by diverting expenditures from conservation to renewable resource development. States should attempt to establish a reasonable parity in the treatment of resources, including energy efficiency, in the design of renewable portfolio standards and other low-carbon resource incentives.

## ***Information to Support Sound Planning and Decisionmaking***

GEN-11. **Resource Assessment.** Bonneville, working with the Council, should re-establish a program of periodically assessing the availability, cost, and performance of generating resources and associated technologies to support the Council's power plan and Bonneville's resource program. These assessments should focus on resources identified in this plan with near- or longer-term promise to the Northwest, including waste-heat energy recovery, bioresidue energy recovery, cogeneration, conventional and enhanced geothermal, hydropower upgrades, new hydropower projects, natural gas technologies for energy, firm capacity and flexibility, wave, and offshore wind power. This work should be coordinated with the inventories of small-scale renewable energy and cogeneration resources called for in GEN-2.

GEN-12. **Planning for optimal development of the power system.** The Council will work with the Wind Integration Forum and other interested entities to identify the optimal development of a future power system containing a high penetration of wind and other new low-carbon resources. This effort should assess the cost and environmental tradeoffs associated with various combinations of transmission facilities, balancing capacity, and storage capacity needed to secure remote or local low-carbon resources. The work will consider the diversity value, and possibly greater productivity, of wind developed on a broader geographic basis, and the tradeoff between conditional firm transmission service and the value of delivered wind energy. Solar, wave, tidal current, and offshore wind sources of low-carbon power should also be evaluated. This work will draw on the results of the flexibility augmentation assessment to estimate the availability, cost, and performance of new sources of system flexibility, including various generating, demand-side, and storage options.

GEN-13. **Long-term synthetic, hourly wind data series.** The Resource Adequacy Forum should complete a long-term synthetic, hourly wind data series. This work is needed to further refine estimates of the sustained peaking value of wind, and to implement analytic capability to evaluate the tradeoffs between hydropower operational constraints and providing flexibility from the hydropower system.

## **FUTURE ROLE OF BONNEVILLE**

The Bonneville section of the action plan encourages Bonneville and its customers to successfully complete and implement the regional dialogue policy and contracts. It recognizes that there remains litigation on some of the elements of the policy, and encourages Bonneville and its customers to resolve the issues, or if necessary, to seek a legislative solution to the contested areas. The action plan says Bonneville should follow the Council's regional resource strategy in its own acquisitions, and meet its share of the conservation targets as it has agreed to do. Bonneville should actively fund and support regional conservation activities and provide incentives and support for utility conservation acquisitions. It specifies that Bonneville continue to meet its fish and wildlife mitigation responsibilities.

BPA-1. **Implement the Council's Plan.** Pursuant to the overall directives of the Act, Bonneville's resource acquisition activities should be consistent with the Council's power

plan, including the resource strategies relevant to Bonneville identified in other sections of the action plan and further described in Chapter 12.

**BPA-2. Conservation goals.** Bonneville should meet its conservation goals. The Council believes Bonneville should observe certain principles in designing its post-2011 energy efficiency efforts. These principles include:

- a. **Conservation targets.** Bonneville should continue to commit that it will work with its public utility customers and meet Bonneville's share of the Council's conservation targets. Bonneville should ensure that public utilities have the incentives, support, and flexibility to pursue sustained conservation acquisitions appropriate to their service areas in a cooperative manner, as set forth in detail in the conservation action plan items, especially in the introduction and in CONS-1, CONS-14 and CONS-17. The Council supports Bonneville's regional dialogue policy to fund conservation primarily as a tier 1 obligation of the federal base system (FBS).
- b. **Utility reporting.** Bonneville should enforce provisions in its power sales contracts that require utility reporting and verification of conservation savings so that Bonneville and the Council can track whether conservation targets are being achieved.
- c. **Implementation mechanism.** Bonneville should offer flexible and workable programs to assist utilities in meeting the conservation goals, including a backstop role for Bonneville should utility programs fail to achieve these goals.
- d. **Regional conservation support.** Bonneville should continue to be active in funding and implementing conservation programs and activities that are inherently regional in scope, such as the Northwest Energy Efficiency Alliance, the Regional Technical Forum, and other regional efforts proposed as a result of the Northwest Energy Efficiency Taskforce process.

**BPA-3. Additional resources, including capacity and flexibility priorities.** Bonneville may have a need for additional resources for a number of reasons, including possible resource acquisitions to address capacity and flexibility needs, after taking account of its conservation acquisition. Bonneville should make these resource acquisition decisions consistent with the following:

- a. **Institutional changes to meet flexibility needs.** Bonneville should aggressively pursue the various institutional and business practice changes that are currently being discussed to reduce the demand for flexibility, and more fully to use existing resources (federal and non-federal) for its balancing needs, before acquiring additional generating resources for this purpose. These institutional measures, including better forecasting, short-term wind curtailment, sub-hourly scheduling, markets for the exchange of balancing services among balancing authorities, generation owners and operators, and demand response providers, have the potential to be more cost-effective and faster to develop than building new generation.



- b. **Generation for capacity and flexibility.** Institutional changes described above may require complex multilateral agreements and similarly complex changes in operating systems. And even if accomplished, these changes may not completely solve Bonneville's flexibility needs. Given these factors, BPA may need to acquire flexibility or capacity resources that could include investments in a smart grid and storage. Bonneville should take a broad look at the cost-effectiveness and reliability of the possible sources of additional capacity and flexibility if it turns out they are needed to meet its obligations. The possible synergies in simultaneously meeting both capacity and flexibility requirements need to be taken into account, and the possibility of newly developed technologies should also be considered.
- c. **Possible additional resources to meet other needs.** Besides the flexibility and capacity needs described above, Bonneville may need additional resources for a number of reasons. These include Bonneville's proposal to acquire resources to augment the existing system to serve the "high water mark" load of its preference customers at tier 1 rates; additional energy resources, if needed, because customers call on Bonneville to meet their load growth; at tier 2 rates reflecting the costs of the additional resources; additional resources to serve DSI loads, if Bonneville decides to offer such service; additional resources necessary for system reserves, system reliability, and transmission support; and additional resources to assist the Administrator in meeting Bonneville's fish and wildlife obligations under Section 4(h) of the Northwest Power Act. Conservation resources will help reduce the need for additional resources, but may not address all of these needs. The Council is not undertaking at this time a detailed, quantitative assessment of Bonneville's need for additional resources for any of these reasons, but will work with Bonneville to identify if these needs exist and whether and when additional resources should be acquired. In making decisions about additional resources for these reasons, Bonneville should act consistent with the principles set forth in Chapter 12 and with the details in the relevant resource chapters of the plan.
- BPA-4. **Proper financial incentives for customers.** Bonneville should meet the loads placed on the agency by its customers and ensure system reliability with the existing federal base system, acquire conservation resources and, if necessary, acquire additional generating resources consistent with the power plan and with Bonneville's regional dialogue policy and tiered rates methodology. Bonneville resource acquisitions to meet customers' loads above their "high water marks" should be structured so that these customers bear the financial risk associated with such acquisitions.
- BPA-5. **Focus on preserving the FBS.** Bonneville should conduct its business in a way that will preserve the benefits of the FBS for the region.
- BPA-6. **Fish and wildlife.** Bonneville should meet its fish and wildlife obligations.
- BPA-7. **Implement the regional dialogue policy.** Bonneville should implement the policy choices it has made in adopting tiered rates, signing long-term contracts, and

revising its residential exchange program in ways that will allow the agency to achieve the goals identified in the various regional processes that established Bonneville's future role.

**BPA-8. Solve legal challenges to regional dialogue implementation.** Bonneville should be prepared to take all necessary steps to revise those policy choices, as necessary, if the Ninth Circuit rules that the choices or some aspects of the choices must be overturned. Bonneville should be prepared to engage the region in any such revisions. If Bonneville's policies for tiered rates, the residential exchange program (including the average system cost methodology), long-term contracts and related matters are struck down by the Ninth Circuit, Bonneville should initiate regional efforts to bring those policies into line with the court's decision(s) or, if necessary, after exhausting legal remedies, seek a legislative solution to enable the agency to achieve the goals those policies were intended to reach.

**BPA-9. Conditions if considering service to the DSIs.** If the Administrator decides to offer service to the DSIs, consistent with any court rulings, such service should include the reserves required under the Northwest Power Act and provide, so far as possible, additional ancillary services.

## ENSURING ADEQUACY

Developing and adopting regional adequacy standards was an important accomplishment of one of the key action items in the Council's Fifth Power Plan. It not only protects against future energy or capacity shortages by providing an early warning system, it also helps ensure that fish and wildlife operations are reliably implemented. The action plan is intended to ensure that the Council, working with others in the region, completes an annual assessment using the standards, but also that the Resource Adequacy Forum continues to refine and update the standards to reflect new information and adjust to changing conditions. In addition, an action item is included to enhance the region's ability to assess the adequacy of flexibility resources for within hour wind integration and system balancing.

**ADQ-1. Adequacy Assessment.** The Council, in collaboration with the Northwest Resource Adequacy Forum and others, will annually assess the adequacy of the regional power supply.

**ADQ-2. Data Review.** The Council, in collaboration with the forum and others, will annually review demand and resource data used for the adequacy assessment, compare its results with other regional reports and work to standardize data reporting.

**ADQ-3. Methodology Review.** The Council, in collaboration with the forum and others, will periodically review the Pacific Northwest's adequacy standard and the methodology used to define the standard. If warranted, the Council will amend the standard.

**ADQ-4. Working with other regions.** The Council will monitor adequacy assessment methodologies in other regions and work with the Western Electricity Coordinating

Council to incorporate Pacific Northwest adequacy metrics and assessments into West-wide adequacy reports.

## DEMAND RESPONSE

*Power systems are required to maintain resources to meet extreme peak-load events. Some of these resources are seldom used and therefore are very expensive on a per kilowatt-hour basis if significant capital costs are involved in building the capability. A growing alternative is demand response, which allows voluntary reductions in load during extreme load events or interruptions of generation or transmission. The action plan for demand response includes increasing our understanding of demand response potential and cost-effectiveness. This involves monitoring implementation of demand response in the Pacific Northwest and other areas where more demand response programs have been tested, supporting pilot programs to test demand response approaches, and exploring the potential of demand response as a source of system flexibility for within-hour balancing reserves.*

- DR-1. **Inventory demand response programs.** The Council should compile and maintain an inventory of demand response acquisition programs and pilot programs that are active or in the planning stages in the region. The objective is to encourage communication among planners and administrators of these efforts at early stages in the work so that experience is shared and unnecessary duplication is avoided as much as possible.
- DR-2. **Evaluate and demonstrate demand response programs.** Utilities and regulators should consider not only pilots that test implementation strategies and demonstrate effectiveness of programs that have been successful elsewhere (e.g. direct load control of space heating or air conditioning), but also pilots that explore innovative programs that have little or no history, but have promise (e.g. use of demand response from dispatchable electric water heaters to provide load following and/or wind integration).
- DR-3. **Evaluate potential for providing ancillary services.** The Council, the region's utilities, and regulators should examine demand response as a source of ancillary services, including estimation of potential megawatts available, its cost and cost-effectiveness.
- DR-4. **Monitor new programs.** The Council, the region's utilities, and regulators should monitor new programs to obtain demand response, including Bonneville's pilot programs and the aggregator contracts of PacifiCorp, Portland General Electric, and Idaho Power.
- DR-5. **Monitor experience in other regions.** The Council, the region's utilities and regulators should monitor progress outside the Pacific Northwest on demand response.
- DR-6. **Evaluate direct service industry as a source of demand response.** If Bonneville serves direct service industry load, it should analyze all possibilities for using this load to provide reserves as required in the Power Act. In particular, the potential for this load to provide ancillary services should be examined for its cost-effectiveness.

- DR-7. **Complete the work of the PNDRP.** Council should continue coordinating with the Regulatory Assistance Project, of the Pacific Northwest Demand Response Project (PNDRP). In particular, PNDRP should complete examination of pricing strategies to stimulate demand response.
- DR-8. **Include appliance response controls in standards.** The region should advocate appliance standards that include Smart Grid controls to interrupt load (at least for under frequency events and utility calls). This action item could be included in energy-efficiency action items. Appliances could include:
- a. Water heaters (mixing valve as well as smart thermostat switch)
  - b. Clothes dryers
  - c. Refrigerators
  - d. Freezers
  - e. Air conditioners
- DR-9. **Implement demand response recommendations of NEET.** The final recommendations of the Northwest Energy Efficiency Taskforce are likely to provide suggestions on how to develop demand response in the region. These recommendations should be pursued by the region.
- DR-10. **Improve Council modeling of demand response.** The Council should examine the treatment of demand response in its regional portfolio model to ensure that the model properly captures the benefits and costs of demand response. To the extent that demand response has benefits that are difficult or impossible to simulate with the portfolio model, such as the benefits of demand response providing ancillary services, the Council should work with other parties to identify alternative analytical approaches to estimate these benefits.

## SMART GRID

Smart-grid technologies have the potential to transform the operation of the power system in ways that are difficult to predict, but that hold great potential for improved operations and reliability, and for making electricity consumers partners in maintaining the efficiency and reliability of the power system. These technologies are in their infancy and will take time to develop to full potential. To better understand smart-grid potential, the action plan supports regional pilot programs to gain experience with smart-grid technologies and the role they might play in the power system.

- SG-1. **Monitoring smart grid technology.** Monitor development and adoption of smart grid technology for its benefits and cost-effectiveness.
- SG-2. **Smart grid demonstration.** Evaluate smart grid demonstration projects and develop additional demonstration projects when appropriate.
- SG-3. **Develop evaluation methods.** Develop methodology for evaluating demand response used for ancillary services.

## TRANSMISSION

When the Council developed the Fifth Power Plan, there was reason to be concerned about the transmission system. There had been no progress on improving the operation of the transmission system and little activity in planning for transmission system expansion. To a large extent, this is no longer the case either in the region or in the broader Western interconnection. The Council will continue to participate in WECC activities relating to wind integration, transmission planning, and adequacy assessment. Bonneville is moving ahead with critical transmission expansions within its balancing area, and there are several large transmission projects in various stages of planning by other utilities or merchant transmission providers that would affect the Northwest. The action plan encourages continued regional efforts to improve wind integration capability through improved operational procedures such as reserve sharing, dynamic scheduling, improved wind forecasting, and the ability to curtail wind ramps under extreme conditions.

- TX-1. **Participate in and track WECC activities.** Many of the actions that the Council is interested in, e.g., integration of large amounts of intermittent renewable generation, expansion of the transmission system to accommodate this generation, and development of resource adequacy assessments and guidelines, are affected by WECC actions.
- a. **Wind: Variable Generation Subcommittee (VGS).** The VGS was formed in early 2009 to coordinate WECC actions and information sharing (both internally and with the actions of WECC members) regarding intermittent generation, especially wind and solar. Many of the actions needed to integrate large amounts of intermittent generation into the system need to take place, or are more effective if they take place, on a wider scale than just in the Northwest. Examples include: changes in business practices like scheduling (e.g., to greater frequency than every hour), standardizing protocols for dynamic scheduling, and developing detailed operating dynamics models of wind generation.
  - b. **Resource Adequacy: Loads and Resources Subcommittee (LRS).** LRS develops WECC resource adequacy guidelines and assessments and acts as the interface with NERC in these areas and on NERC's development of standards in the resource adequacy area. The WECC and NERC activities provide the background within which the Council analyzes adequacy issues and approaches and develops assessments.
  - c. **Transmission: Transmission Expansion Planning Policy Committee (TEPPC).** Coordinated transmission planning for larger scale projects needed to move distant, typically renewable, generation to load centers takes place primarily in two forums: subregional planning groups (SPGs) like Northern Tier Transmission Group and ColumbiaGrid and interconnection-wide, through TEPPC. TEPPC provides data and overall scoping studies for the SPGs and other entities like the Committee on Regional Electric Power Cooperation (CREPC) and the Western Governors' Association (WGA). TEPPC is expected to receive substantial funding from DOE under the American Recovery and Reinvestment Act of 2009 (ARRA) to develop an interconnection-wide transmission plan, which will substantially expand the scope of its current activities.

**TX-2. Track transmission expansion proposals and evaluate impact on the region.**

This effort focuses on monitoring the status of transmission proposals that would have significant effects on the ability of regional utilities to develop resources, particularly to import renewables, and to access regional and other markets.

**TX-3. Continue to assess needs and costs of transmission for wind development.****FISH AND POWER**

*The Council's Columbia River Basin Fish and Wildlife Program and Electric Power and Conservation Plan must provide measures to "protect, mitigate, and enhance fish and wildlife affected by the development, operation, and management of [hydropower] facilities while assuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply." In other words, the mutual impacts of fish and power measures are intended to be examined together. By statute, hydroelectric operations to improve fish survival that are specified in the fish and wildlife program become a part of the power plan and the plan must be designed to accommodate these operations and their cost. Guided by the Council's power plan, Bonneville is to acquire resources to assist in meeting the requirements of the fish and wildlife program.*

*The action items listed below are designed to improve the way in which we plan for the long-term needs of both power and fish and wildlife. The key action is for power planners to work more extensively with fish and wildlife managers to explore ways to better identify and analyze long-term uncertainties that affect all elements of fish and power operations. These uncertainties include climate change, electricity demand, fuel prices, policies involving resource operation, and treaties affecting the hydroelectric system. Discussions should provide an opportunity to identify synergies that may exist between power and fish operations and to explore ways of taking advantage of those situations. Another critical topic for discussion is the integration of variable generation resources, its affect on the operation of the hydroelectric system and possible consequences for fish and wildlife.*

**F&W-1. Long-term planning coordination.** The Council will work with federal, state, tribal, and other entities through existing forums to expand the discussion of long-term fish and wildlife and power planning integration.

**F&W-2. Contingency plans.** The Council will continue to work with fish and wildlife managers and regional power planners to: 1) review curtailment plans for fish and wildlife operations in the event of a power emergency; 2) review contingency power operations in the event of a fish and wildlife emergency; and 3) aid in developing a plan to improve our ability to forecast and operate the hydroelectric system to reduce the likelihood of emergencies.

**F&W-3. Analytical capability.** The Council will work with Bonneville and other federal action agencies, federal and state fish-and-wildlife agencies and tribes, and other regional entities (in particular the Independent Economic Analysis Board, the Independent Scientific Advisory Board, and the Independent Scientific Review Panel) to analyze the physical, economic, and biological impacts of alternative operations for fish and wildlife and to develop ways of improving the cost-effectiveness of fish and wildlife programs.

**F&W-4. Columbia River Treaty.** The Council will work with Bonneville and others to examine the impacts of possible changes to the Columbia River Treaty between the United States and Canada. The system flood control elements of the treaty expire during this plan's study horizon, and possible modifications to both the flood control and power supply aspects of the treaty could likely affect both the region's power system and operations to benefit fish and wildlife. The Council should be proactive in addressing this issue.

**F&W-5. Climate change.** The Council will work with federal agencies, the University of Washington's Climate Impacts Group, and others to examine the physical impacts of climate change to electricity demand, river flows, reservoir elevations, power production, and cost. The Council will examine ways to mitigate these impacts and encourage others to improve runoff volume forecasting methods, especially for the fall. The Council will also work to develop methods that include the potential physical impacts of climate change into its resource planning methodology.

## MONITORING PLAN IMPLEMENTATION

The Council will monitor conditions in the region for significant changes that would affect the power plan. The region's progress in implementing the resource strategy in the plan will be assessed and a biennial monitoring report will be prepared describing any significant changes in the assumptions underlying the plan. The monitoring report also will assess resource development in the region including efficiency acquisition compared to the Power Plan's recommendations.

**MON-1 Biennial monitoring report.** Council will monitor implementation of the recommendations in the Sixth Power Plan and report on progress biennially.

**MON-2 Assess changing conditions affecting the plan.** Council will monitor how developing electricity load, fuel price, electricity prices, conservation technologies, resource costs, and other planning forecasts and assumptions compare to assumptions included in the Sixth Power Plan.

**MON-3 Analyze changes for significance.** The Council will conduct analysis of specific changes or issues to determine their effects on the regional power system and the Power Plan.

**MON-4 Monitor climate change policies and analysis.** Continue to monitor progress in climate change models and their assessments of impacts on temperature, precipitation and stream flows. As the need arises, analyze specific climate change scenarios and assess potential effects on the plan's resource strategy.

## MAINTAINING AND ENHANCING COUNCIL'S ANALYTICAL CAPABILITY

The Council's power plan is extremely data and model intensive. Maintaining data on electricity demand, resource development, energy prices, and generating and efficiency resources is a significant effort. It is one that the Council's staff cannot do alone. As recognized in the NEET

recommendations, data collection for the regional power system and alternative resources available to meet demand is something best accomplished through regional cooperation. The action plan contains recommendations to maintain and improve planning data for the region.

**ANLYS-1. Review analytical methods.** As is customary between power plans, the Council will undertake a comprehensive review of the analytic methods and models that are used to support the Council's decisions in the power plan. The goal of this review is to improve the Council's ability to analyze major changes in regional and Bonneville Power systems and make recommendations on how the BPA Administrator can best meet its obligations and ensure a low-cost, low-risk power system for the region. This review will focus on changing regional power system conditions such as capacity constraints, integrating intermittent resources, and transmission limitations because these currently pressing issues will need to be more formally addressed in future power plans. The Council will work with Bonneville and other utilities to evaluate available data and models that can be used to support the Council's planning. This action item will require the Council to clearly define the planning problems facing BPA and the region and identify or develop new analytic tools that can help the Council to identify the best possible approaches to meet the region's and BPA's future power needs.

**ANLYS-2. Improve hourly load data.** Work with utilities and NWPP to standardize collection of regional hourly loads data. Currently there is a substantial lag in getting regional hourly loads from NWPP. In fact, the last year of hourly data from NWPP is for 2002. This situation creates problems for updating the short-term forecasting model which is used for resource adequacy work.

**ANLYS-3. Improve irrigation sales reporting.** Work with utilities to receive irrigation sales data annually. Currently, there is a substantial problem with getting accurate data on irrigation sales in the region. This problem is more pronounced when it comes to public utilities. This problem has been solved in the past by Council staff devoting a substantial amount of work to contact individual utilities and obtain the data.

**ANLYS-4. Improve industrial sales data.** Work with utilities to improve industrial sector sales data. Currently, industrial sales are reported by utilities to FERC and EIA in an aggregate fashion. Reporting sales data at a more disaggregated industrial level would improve the ability to forecast loads. Confidentiality concerns should be addressed and solved.

**ANLYS-5. Follow up on NEET data recommendations.** There are other "data holes" where updating information would substantially benefit the region. Some of these data needs were identified in the NEET recommendation from workgroup 1. An action item would be to track and implement NEET recommendations. Examples of data holes are:

- a. End-use hourly load shapes
- b. Energy use for end-uses (ICE)
- c. Establishing panel data for residential and small commercial, especially elder care facilities.
- d. Improve the baseline consumption and conservation potential for data centers

**ANLYS-6. Improve electricity end-use data.** Work with NEEA, RTF and utilities to:



- a. Develop a common survey and data gathering instrument
  - b. Develop the requirements for a data clearinghouse
  - c. Develop the data gathering cycles for each sector/measure
  - d. Coordinate the data gathering implementation plan for 2010-2015
- ANLYS-7. **Improve peak-load forecasting.** Facilitate a discussion among regional forecasters and others on peak-load forecasting methodologies used in the region.
- ANLYS-8. **Improve natural gas demand forecasting.** Work with regional gas utility demand forecasters to fine-tune gas forecasting capabilities of the load forecasting model
- ANLYS-9. **Develop the supply side of the demand forecasting system.** Work with BPA to integrate the electric supply module of long-term forecasting model with the current demand forecasting model. This integration should enhance the Council's ability to see the impact of various policies in a more cohesive manner.
- ANLYS-10. **Improve transportation electricity use forecasting.** Enhance the electric transportation segment of the long-term model for better representation of potential demand and impact on electric supply from the plug-in hybrid electric vehicles.
- ANLYS-11. **Demand response modeling methods.** Work with BPA and others to incorporate the framework for modeling DR in the long-term forecasting model.
- ANLYS-12. **Evaluating sustained-peaking capability of the hydroelectric system.** Work with others in the region, in particular the Resource Adequacy Forum, to develop a better methodology to assess the sustained-peaking capability of the regional hydroelectric system.
- ANLYS-13. **Improved demand response modeling.** The Council should examine the regional portfolio model's treatment of demand response in case there are opportunities for improvement (see Action Item DR-9).
- ANLYS-14. **Planning coordination and information outreach.** The Council will continue to participate in the development of Bonneville's Resource Program and in utility integrated resource planning efforts. In addition, the Council will periodically convene its planning advisory committees including the Natural Gas Advisory Committee, Conservation Resources Advisory Committee and Generating Resources Advisory Committee for purposes of sharing information, tools, and approaches to resource planning.
- ANLYS-15. **Improve Regional Conservation Resource Potential Assessment Input Assumptions and Methodology.** The Council will convene Conservation Resources Advisory Committee to identify data and methodological requirements that are required to support regionally consistent utility or sub-regional assessments of the conservation resource potential. The Council, in cooperation with NEEA, BPA, regional utilities, and administrators of system benefit charge programs will seek to prioritize that market research and data development necessary to implement improvements in both the Council and utility conservation potentials assessments.

**ANLYS-16. Review of Council Policy on Direct Use of Natural Gas.** The Council was unable to complete the analysis of the economics and emissions impacts of the direct use of natural gas prior to the release of the draft Sixth Power Plan. Due to the significant regional interest in this analysis, the Council believes it should provide adequate opportunity for review and comment on the input assumptions and results of this work before considering changes to its current policy. Therefore, the Council will complete this analysis during the first six months of 2010 during which time it will conduct a public review process to consider any policy changes and action items related to its findings.

**ANLYS-17. Incorporate conservation acquisition risk.** Council staff began the modification of the resource portfolio model to reflect uncertainty about conservation achievement rates. The revisions will be completed as an action over the next year, so that conservation uncertainties can be treated similarly to other resource risks in the Council's analysis. For the Sixth Power Plan, the Council has treated this uncertainty through scenario analysis.