

Sixth Power Plan Action Plan

Conservation	1
Conservation: Deployment	2
Conservation: Adaptive Management.....	5
Conservation: Development and Confirmation	8
Generating Resources	9
Generating Resource Acquisition	10
Adequacy of System Integration Services	11
Expanding the Menu of Cost-effective Low Carbon Resources	12
Information to Support Sound Planning and Decision Making.....	15
Future Role of Bonneville.....	15
Ensuring Adequacy.....	18
Demand Response.....	19
Smart Grid.....	20
Transmission.....	21
Fish and Power.....	22
Monitoring Plan Implementation.....	23
Maintaining and Enhancing Council’s Analytical Capability	24

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 green house gas emissions. With green house 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 efficiency potential that has been identified (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, to track and verify achievements, and adaptively manage regional efficiency acquisition strategies.

The Council target for regional acquisition of conservation over the first 5 years of the Plan is 1200 MWa. However, the conservation target relies on forecasts of underlying load and economic conditions, such as the rate of economic recovery and the construction rate of new

buildings, that may turn out to be different in the next five years than forecast. The uncertainties of the underlying assumptions thus create uncertainty about the total amount of the targeted conservation that will be available to acquire in the first five years. For this reason, the Council also developed a range of likely conservation savings over the first 5 years of 1100 to 1400 MWa. 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 6th Power Plan. The Council may choose to adjust the conservation target following a mid-term review to reflect actual achievements or conditions different than forecast that have effected the total amount of conservation available. These periodic evaluations will help the Council to monitor actual conservation savings and help prepare for the next major power plan in 5 years.

Conservation: Deployment

CONS-1. Achieve the level of conservation resource acquisition identified in the Sixth 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]¹ The Council believes that the region should be able to achieve at least 1,200 average megawatts of cost-effective conservation savings under the majority of future conditions. 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. Therefore, the Sixth Plan's likely range of conservation savings is from a low of 1100 average megawatts of savings to a high of 1,400 average megawatts over the next five years. Since the future is uncertain, Action Item CONS-16, calls for a mid-term review of regional progress towards the regional conservation target and to consider any adjustment to that target during the remainder of the period covered by the Action Plan. In addition the mid-term review will assess the potential impacts on other resource actions if there is significant difference, either up or down, in conservation acquisitions from the targets.

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 Sixth Plan identified nearly 6,000 average megawatts of cost-effective conservation realistically achievable over twenty years. Of that, approximately 2,500 average megawatts will require new initiatives, programs, market transformation efforts or progress towards 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 that the

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

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 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 program 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 Program 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 polices 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. [To State Utility Regulatory Commissions, Investor-Owned and Publicly Owned Utilities, States, BPA and Others]

Conservation: 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 Plan's regional conservation target and accomplish the other actions set forth in the Sixth Plan 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 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 towards 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 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 decision makers 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 towards 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 towards meeting 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 others issues. [Council] Guidance is needed to ensure that the Sixth 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 and implement effective and administratively-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.

Conservation: Development and Confirmation

The Sixth 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 Sixth 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 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 energy perspective, new generating capacity in excess of that needed to meet state renewable portfolio standards is unlikely to be needed in the near-term² for the purpose of maintaining energy adequacy. Additional energy acquisitions for the purpose of risk or cost reduction also appear not to be cost-effective. Although the region as a whole does not appear to be short of energy, this may not be true for individual utilities, some of which may be surplus while others may need to acquire additional energy generation capacity because of transmission or other limitations that constrain access to energy markets and surplus generation. This action plan includes guidelines for energy acquisitions in these circumstances.

Though the summertime surplus of firm capacity is declining, additional firm capacity is not needed on a region-wide basis in the near-term for the purpose of maintaining adequate winter or summer peaking reserves. However, continued development of wind power to meet regional renewable portfolio standards and for export³ will continue to increase the demand for balancing capacity⁴. This action plan includes actions to reduce the demand for system flexibility, to more fully access the latent flexibility of the existing system and to better understand the interactions between provision of balancing, capacity and energy services. These actions are consistent with the current recommendations of the Northwest Wind Integration Action Plan.

Even with implementation of measures to more effectively use existing system flexibility, continued development of variable-output resources may eventually lead to the need to augment capacity and flexibility. Though the timing of this need on a regional basis is poorly understood,

² First five years of the 20-year period of the plan.

³ Balancing authorities are obligated to provide interconnection and integration services for generators irrespective of local need.

⁴ Balancing capability (often referred to as system flexibility or regulation and load-following) refers to the ability to balance generation and loads on seconds to minutes (regulation) and within-hour (load-following) bases.

Bonneville has asserted that it may confront this need in the near-term because of the geographic concentration of wind development within the Bonneville balancing area. This action plan includes guidelines for capacity acquisitions in these circumstances. As the region considers the cost effectiveness of new low or non-carbon emitting resource options, it will need to explicitly consider the costs that may be associated with the potential need to develop complementary carbon fueled resources to firm and shape variable-output non-carbon fueled generation, as well as the costs to the environment and region to develop necessary transmission facilities to integrate such resources. The region should also consider the carbon reduction attributes associated with using other technologies to integrate wind, such as smart grid and storage.

Over the longer-term it is expected that additional sources of low-carbon energy will be needed to reduce carbon dioxide production to sustainable levels. Cost-effective near-term low-carbon options include wind, limited quantities of geothermal, biogas and biomass residues, new hydropower and hydropower upgrades, and high-efficiency natural gas generation and cogeneration. Expanding the suite of available cost-effective low-carbon resource choices would be beneficial. 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 for the capture, storage or recycling of carbon from existing and new fossil-fueled power plants. This action plan includes actions to promote the cost-effectiveness and availability of additional low-carbon generating resources with a focus on options of special relevance to the Northwest.

Sound power system planning and decisions require capable analysis tools and reliable supporting data. In particular, techniques and data for assessing the most cost-effective approaches for long-term development and integration of variable-output resources are inadequate or lacking. This action plan contains actions to support improved planning and decision-making.

Generating Resource Acquisition

GEN-1. Acquisitions to meet capacity, energy and ancillary service needs. Bonneville, other balancing authorities and utilities needing to acquire resources to serve capacity, energy and ancillary service needs 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). Resource cost-effectiveness evaluations should recognize the net value of services provided (e.g., energy, capacity, ancillary services, avoided transmission and distribution costs, cogeneration load) and services needed to support (e.g., transmission, balancing services, supplemental firm capacity) the available alternatives. Resource-related risks including investment, performance and environmental 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, it is evident that certain 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 tend to be challenging to develop because of the complexity of business arrangements, engineering, fuel supply and interconnection, proportionally high transaction costs and long lead times, coupled with relatively small size. Design and engineering is often highly site-specific, as are costs and business arrangements. If successful, however, these projects can provide baseload energy, avoided transmission and distribution costs, residue disposal solutions, local economic development, 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 undertaking activities such as the following:

- Surveys of resource development potential
- Requests for proposals structured to accommodate small and diverse projects
- “Open window” application and evaluation process for unsolicited proposals
- Standard power purchase offers for qualifying projects
- Standard interconnection provisions
- Consideration of all project attributes in proposal evaluations
- Provision of financial, engineering and other development assistance
- Support for demonstration and pilot projects for developing, testing and demonstrating technology and business practices

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 ACE⁵ diversity sharing among balancing areas. The Northwest Wind Integration Forum, working with Bonneville, regional utilities and grid entities should assess the feasibility, cost and benefits of these and other possible measures that would reduce the demand for balancing reserves and implement promising measures. *This action is of high priority.*

GEN-4. **Expand access to existing system flexibility.** Some of the latent balancing capability of the existing power system cannot be used because of operating protocols, transmission and communication limitations, absence of equipment allowing plants to be operated for balancing purposes and environmental constraints. The 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 necessary to provide balancing capability. The Northwest Wind Integration Forum, working with regional balancing authorities and grid entities should assess the feasibility, cost and benefits of expanded dynamic scheduling within region and across the Northern and Southern interties. Attractive opportunities for expansion should be

⁵ 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.

developed. This working group should also work with plant owners to establish balancing capability for generating units theoretically, but not currently practically capable of providing balancing services. *This action is of high priority.*

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 and implement a methodology for evaluating the adequacy of fast-response balancing capability.

GEN-6. Evaluate flexibility augmentation options. This plan recommends development of wind and other renewable resources to offset carbon control cost and natural gas price risks. Addition of wind and other variable-output resources will continue to expand the need for balancing capability. In response to this need, the highest 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 meet the needs of an expanding inventory of variable-output resources. The Council, working with the Wind Integration Forum will undertake an effort to 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 include, but not be limited to, consideration of combined-cycle plants, gas turbine generators and reciprocating engines, compressed air energy storage, pumped storage hydro, battery storage, smart grid and demand-side options. Metrics should be developed to measure and compare the various options. The completed assessment should include a plan of development, consisting of research, development and demonstration activities, needed to ensure that the most promising options are available for operation when required. *Because of the early commercial status or long development lead time of several of these options, this action is of high priority.*

Expanding the Menu of Cost-effective Low Carbon Resources

GEN-7. Commercialize and confirm promising low-carbon resources. Wave energy, deep-water wind power and enhanced geothermal 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 and to establish the body of knowledge and legal framework to support commercial development of the resources when available and needed. These efforts would include: 1) energy resource measurements of sufficient geographic scope, frequency and duration to support assessment of resource economics, identification of promising resource areas and assessment of resource integration needs; 2) technology assessment; 3) identification and resolution of potential environmental, economic and other development conflicts; 4)

demonstration projects to test and evaluate technology; 5) assessment of system integration needs; and, 6) pilot projects to serve as the basis for commercial development. The initiatives of the Oregon Wave Energy Trust provides a model of a comprehensive resource confirmation agenda.

GEN-8. Resource development mandates and incentives. A diverse collection of federal and state resource development mandates and incentives has developed over time. The underlying public interest goals of mandates and incentives include commercialization of immature but promising technologies, developing the power system and social “infrastructure” for accommodating commercial-scale development of promising resources and promoting the 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 impact efficient system operation. The Council will undertake a review of the impacts and effectiveness of mandates and incentives including consideration of the following:

- a. **Impact of production tax credits on optimal dispatch.** The federal production tax credit lowers the effective variable cost of generation, in some cases 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.** A renewable energy credit (REC) generally represents the environmental and renewable attributes of renewable energy production as a separate commodity from the associated energy. RECs can be transacted as “bundled” (i.e., with the associated energy) or “unbundled” (separate from the associated energy). Some states credit unbundled RECs (also called “tradable RECs”) to meeting a portion of renewable portfolio standards. Unbundled sale of RECs allows utilities to acquire the attributes of renewable power without securing transmission from the renewable energy plant to the utility’s service territory. To the extent that the renewable energy benefits are not location-specific (e.g., avoided carbon dioxide production), tradable RECs can reduce the cost to utilities of securing these attributes by allowing a utility to avoid transmission wheeling charges and to purchase from a higher quality, lower cost renewable resource than might otherwise be available. Tradable RECs can also provide a revenue stream to utilities choosing to develop renewable resources in advance of need without having to establish transmission to the customer utility, and can foster the non-power economic benefits of renewable energy resource development. Stimulating additional development of variable-output resources in the Pacific Northwest without corresponding inter-regional transmission connections may, however, create challenges for the region. The residual (“null”) power will be marketed locally and may depress the value of competing, non-RPS-qualifying energy. Integrating the additional variable-output resources that may be developed to export unbundled RECs will increase the demand for integration services, thus possibly increasing the costs of such services. This could have the effect of driving up costs of integrating variable-output resources needed to comply with RPS requirements within the region, even for variable-output resources where RECs will not be unbundled, but consumed in

the region. The purpose of this review will be to identify and articulate the costs and benefits of the unbundled REC market and to suggest modifications, if any, needed to remedy significant inequities or perverse incentives.

- c. **Geothermal development risk reduction.** Geothermal is a very 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, directed to offsetting 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 CO₂ reduction parity of resource mandates and incentives.** The principal underlying public purpose of many resource mandates and incentives is reduction in greenhouse gasses, yet CO₂ 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 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 conservation in the design of renewable portfolio standards and other low-carbon resource incentives.
- GEN-9. **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 longer-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-10. **Monitoring development of other promising resources and technologies.** Certain emerging resources and technologies have potential though not exclusive application in the Northwest. These include technologies for post-combustion carbon dioxide capture from conventional fossil-fuel power plants, carbon dioxide “recycling” technologies such as algae-derived biofuel production, 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. The commercial development of these technologies will be promoted by policies, incentives and other technological development drivers enacted at the global or federal level, or within regions where the technology might play a particularly vital role. While active participation of Northwest entities in the development of these technologies is not necessary, development of these technologies

should be closely monitored. Moreover consideration might be given to joint participate in demonstration projects and other resource development efforts.

Information to Support Sound Planning and Decision Making

GEN-11. **Resource Assessment.** Bonneville, working with the Council should reestablish 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, working with the Wind Integration Forum, should undertake an effort 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 possible 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 upon the results of the flexibility augmentation assessment for estimates of 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 development of 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 tradeoffs between hydrosystem operational constraints and the availability of flexibility.

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 the 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 new generation to provide these services.

- 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, which 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 that 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 one or more 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 as may be necessary for system reserves, system reliability, and transmission support; and additional resources if necessary 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 the 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, acquired conservation resources and, if necessary, additional generating resources that Bonneville acquires 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, 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 consider service to the DSIs, such service should:

- have the lowest impact possible on other customers' rates;
- provide, so far as possible, ancillary services;
- provide the reserves required under the Northwest Power Act; and
- be offered at rates that will allow the DSIs a reasonable opportunity for operations in the region.

ENSURING ADEQUACY

Development and adoption of 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, complete 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 loads 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. An alternative growing in potential is demand response, which allows voluntary reductions in load during extreme loads 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 further 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 have little or no history but that have promise (e.g. use of demand response for load following).

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 its 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 these loads to provide reserves as required in the Power Act. In particular the potential for these loads to provide ancillary services should be examined for its cost effectiveness.
- DR-7. Complete the work of the PNDRP.** Council staff should continue the coordination, with the Regulatory Assistance Project, of the Pacific Northwest Demand Response Project (PNDRP). In particular, PNDRP should complete the 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 consideration of 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 as to 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

The development of smart-grid technologies has 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 understand better 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
- SG-2. Smart grid demonstration.** Develop smart grid demonstration projects.

- 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 / 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, and can be assisted by, actions at WECC.
- 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 that need to take place 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 the Northwest. Examples are 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 on 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: first, sub regional planning groups (SPGs) like Northern Tier Transmission Group and ColumbiaGrid and second, interconnection-wide, through TEPPC. TEPPC acts as a data provider and provider of 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 to create a public forum which brings together power planners and 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, demand, fuel prices, policies involving resource operation, and treaties affecting the hydroelectric system. Forum members will assist in developing ways to integrate these uncertainties into the Council's planning models.

The forum will also provide an opportunity to identify synergies that may exist between power and fish operations and to explore ways of taking advantage of those situations. For example, the acquisition of fish and wildlife habitat may also an opportunity to mitigate the effects of carbon emissions. The forum will also be expected to examine the impacts of fish and wildlife operations on the flexibility and capacity of the hydroelectric system and explore ways to minimize those impacts. These and other issues that may come up in the future need to be discussed in an open forum with both fish and power planners involved.

F&W-1. Long-term planning forum. The Council will work with federal, state, tribal and other entities in a public forum to improve the integration of long-term fish and wildlife operations and power planning.

F&W-2. Contingency plans. The Council will work with fish and wildlife managers and regional power planners to; 1) develop a curtailment plan for fish and wildlife operations in the event of a power emergency, 2) prepare a contingency power operation in the event

of a fish and wildlife emergency, and 3) develop a plan for continued improvement in our ability to forecast and operate the 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 treaty expires during this plan's study horizon and modifications to the treaty are very likely to affect both power and fish and wildlife. The Council should be proactive in addressing this issue.

F&W-5. Climate change. The Council will work with Bonneville, 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 for these impacts and encourage others to improve runoff volume forecasting methods, especially for the fall.

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 Plan and report on progress biennially.

MON-1 Assess changing conditions affecting the plan. Council will monitor how developing electricity loads, fuel price, electricity prices, conservation technologies, resource costs, and other planning forecasts and assumptions compare to assumptions included in the Sixth Plan.

MON-1 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-1 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 development of 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 collection of data relating to 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 on the Council's ability to analyze major changes in regional and Bonneville Power systems and make recommendations on how best for the BPA Administrator to meet BPA's obligations and for the region as a whole to achieve as low cost and low risk in future power plans as possible. This review will focus on changing regional power system conditions such as capacity constraints, integration of 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 meeting 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 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 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 putting substantial amount of work by staff 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 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. Example 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 in use 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 Council's ability to see 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. Evaluation of 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.