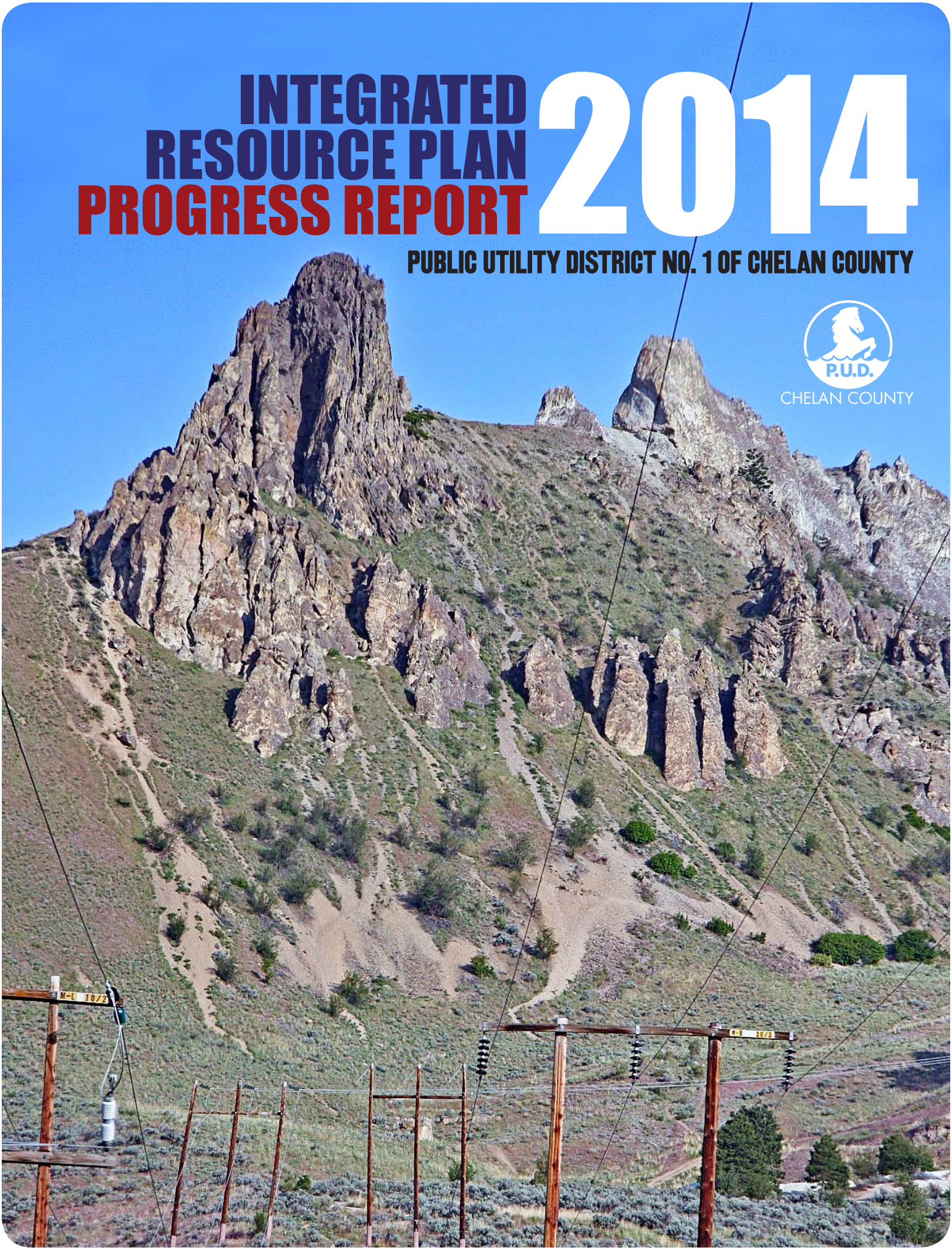
INTEGRATED RESOURCE PLAN PROGRESS REPORT 2014

PUBLIC UTILITY DISTRICT NO. 1 OF CHELAN COUNTY

P.U.D.
CHELAN COUNTY



2014 Integrated Resource Plan Progress Report

July 2014

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2014 Progress Report

Summary of Determinations

The District has completed its 2014 Integrated Resource Plan (IRP) Progress Report. This Progress Report is required by the Revised Code of Washington (RCW) 19.280: Electric Utility Resource Plans passed by the legislature in 2006. According to the statute, "it is the intent of the legislature to encourage the development of new safe, clean and reliable energy resources to meet demand in Washington for affordable and reliable electricity. To achieve this end, the legislature finds it essential that electric utilities in Washington develop comprehensive resource plans that explain the mix of generation and demand-side resources they plan to use to meet their customers' electricity needs in both the short-term and the long-term." The enacted legislation requires investor-owned and consumer-owned utilities with more than 25,000 retail customers to produce a progress report every two years and a fully updated 10-year plan every four years. Consumer-owned utilities shall encourage participation of their consumers in development of their IRPs and progress reports after providing public notice and hearing.

Based upon the analysis over the 2014-2024 planning period, the Board of Commissioners of Chelan County Public Utility District (Chelan PUD or District) has approved this 2014 Progress Report and determined that:

- The District retain its current mix of generating resources.

And additionally:

- The District continue to evaluate and implement conservation programs based on the foundational work performed in the 2013 conservation potential assessment (CPA).
- The District carry on the evaluation and implementation of strategies for additional power sales contracts consistent with financial policies and the hedging strategy.

These determinations continue to provide the platform for the District to serve its customer/owners with reliable, low-cost, renewable energy resources for the foreseeable future.

Report Overview

To meet the requirements of RCW 19.280, the development of Chelan PUD's 2014 Progress Report includes the following:

- An update of the long-term forecasts of retail electric customer demand
- Revised costs and operational information for Chelan PUD's existing generating resources.
- Updated data in regards to the District's existing operational and power sales contracts.
- Amended conservation inputs to align with Chelan PUD's January 2014 10-year conservation plan submittal to the Washington State Department of Commerce (Commerce) as required.
- A reaffirmation of Chelan PUD's resource adequacy measures.
- Analyze the forecasted load/resource balance (using the District's existing portfolio of resources) with the aforementioned input changes, additionally evaluating service reliability and environmental impacts and communicating with customers and the public.
- Board approval of the Progress Report.
- Submittal of the final Progress Report to Commerce by September 1, 2014 as required.

Planning & Regulatory Environment

Resource Planning Situation

Chelan PUD is forecasted to be surplus to its own retail load needs throughout the current planning period (2014-2024).

In late 2011 and mid 2012, several long-term Rocky Reach and Rock Island power purchaser contracts, respectively, expired. Going forward, the District retained a larger portion of the output at both projects and entered into shorter-term contracts for a portion of the output providing the District more flexibility. The shorter-term contracts, part of the District's hedging policy, are discussed more fully in the Portfolio Analysis section.

The Washington State Renewable Performance Standard (RPS) (Energy Independence Act of 2006) requires utilities to serve a certain percentage of their retail load with renewable resources and acquire all cost-effective conservation. This legislation and other regional efforts have increased the amount of renewable energy in the wholesale power markets. The effect of increased wind capacity and overgeneration events in the region is discussed in the Resources section.

Regulatory & Statutory Requirements

In addition to the integrated resource planning requirements of RCW 19.280, the District is directly affected by other regulatory and legislative actions that relate to resource planning. Those of greatest focus for Chelan PUD and the region are discussed below. These requirements were specifically evaluated in the preparation and adoption of this Progress Report.

Renewable Portfolio Standard (RPS)

On the District's radar since 2006, RCW 19.285, The Energy Independence Act, requires utilities with a retail load of more than 25,000 customers to use eligible renewable resources (excluding most existing hydroelectric power) or acquire equivalent renewable energy credits (REC), or a combination of both, to meet 3% of retail load by January 1, 2012, 9% by January 1, 2016 and 15% by January 1, 2020. Under the law, the District can count recent efficiency gains (i.e., those made after March 31, 1999) at its existing hydropower projects toward meeting the RPS. Additionally, the District's entire share of the Nine Canyon Wind Project qualifies as an eligible renewable resource for meeting the requirement of the RPS. The law also required that by January 1, 2010, utilities evaluate conservation resources, submit their initial 10-year conservation plans and begin pursuing all conservation that is cost-effective, reliable and feasible. This 2014 Progress Report includes updates to the evaluations and required reporting under both the renewable and conservation portions of the RPS which are discussed further below.

Resource Adequacy

Resource Adequacy Advisory Committee

As previously discussed in District IRPs, in 2005, the Northwest Power and Conservation Council (NWPCC or Council) and the Bonneville Power Administration (BPA) created the Pacific Northwest Resource Adequacy Forum and tasked it to develop an adequacy standard for the regional power supply. The purpose of the standard is to provide an early warning should resource development fail to keep pace with demand growth. In July 2013, the Council approved a charter for the Resource Adequacy Advisory Committee (RAAC), which replaced the previous forum. The revision was to put the group on stature with other Council advisory committees. The action promoted the work that the committee had done for eight years to define and assess power supply adequacy and related issues.

The current, **voluntary** standard was adopted in December 2011. Regional adequacy assessments are not intended to apply directly to individual utilities because no utility has the same load and resource profile as the region. However, the probabilistic methodology imbedded in the standard is recommended for utilities to do their own assessments. The standard uses the system's loss of load probability (LOLP) as the adequacy metric with a maximum allowable LOLP of 5%. A single annual

value is assessed, which identifies both energy and capacity problems. It is not intended to be a resource planning target.

The adequacy assessment is affected by several moving parts. Regional electricity demand, new and retiring generating capacity and non-firm resources, including those in California, are amongst the largest variables. These amounts are open for discussion and reviewed with each assessment.

The assessment is not a substitute for a comprehensive resource acquisition plan. The optimal amount and mix of new resources needed to provide an adequate, efficient, economic and reliable regional power system is determined by the Council's Power Plan. The results should be viewed as a conservatively lower bound on regional needs for new resource capacity.

The current assessment for the 2019 operating year shows a 6% LOLP, a slight improvement from the December 2012 assessment of 7% for 2017. The LOLP between 2017 and 2019 declines primarily because the amount of generation from new (sited and licensed) power plants soon to come online is greater than the anticipated growth in demand for electricity between 2017 and 2019. Important to this conclusion is the Council's anticipation that the Northwest will achieve the Council's energy efficiency savings target of about 350 average megawatts per year between 2017 and 2019. That achievement helps offset the need for more costly new power plants. By 2021, however, the LOLP increases to 11% as the result of the planned retirements of coal-fired power plants in Boardman, Oregon, and Centralia, Washington (May 7, 2014 Council document 2014-04). Demand response (DR) may also be a viable option but was not analyzed.

Demand Response

DR is defined as "changes in electric usage by end-use customers from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized" according to the Federal Energy Regulatory Commission (FERC). The region is looking at DR more closely. BPA has conducted 15 DR pilots and is in the midst of a DR market demonstration pilot involving the City of Port Angeles and a paper mill located there. BPA has a number of other DR programs planned, including developing a DR investment toolkit for its customer utilities and assembling a portfolio of 80 to 100 MW of DR by late 2015.

The NWPCC is beginning development of the Seventh Power Plan. They plan to start building a framework to evaluate DR on par with resources that are built and energy efficiency, so that the Power Plan has a holistic approach to looking at the value of combining it with other resources. There are DR technologies available that weren't available during the development of the Sixth Power Plan. The region now has a lot of low variable cost renewable resources available, so the power system is not so energy constrained. In addition to being a capacity peaking resource, DR is also a way to delay building new generation, while improving transmission system operations and reliability. The Council is also involved with the Pacific Northwest Demand Response Project (PNDRP), which is examining DR's role and potential in managing the region's power system. A cooperative effort involving the Council and the Regulatory Assistance Project, PNDRP started in 2005 and holds a couple of meetings a year.

Chelan PUD has one agreement falling under the umbrella of DR. It is a load shedding agreement with Alcoa Power Generating, Inc. (APGI) and Alcoa, Inc. (Alcoa). A load shedding event can be implemented electronically by sending a signal from the District's dispatch operations to APGI/Alcoa's plant control remote terminal unit at the McKenzie substation. The agreement allows for a frequency of no more than four times in any calendar year and for an amount of energy up to 20 MW per hour. The District is able to count the 20 MW as part of its operating reserves.

The District analyzed its resource adequacy in the preparation of this 2014 Progress Report.

State Climate and Energy Policy

On April 29, 2014, Washington Governor Inslee announced executive action to reduce carbon pollution and promote clean energy (Washington Governor's Office Press Release April 29, 2014). He signed an executive order outlining a series of steps to cut carbon pollution in Washington and advance development and use of clean energy technologies.

Inslee's executive order builds on earlier studies and work groups to create an action plan in key areas. It does not implement any new programs, instead setting out a deliberative and public process. Most of the major action plan elements listed below will require either legislative approval or legislative appropriation for funding.

The Legislature, in 2008, adopted a timeline for reducing greenhouse gas emissions, calling for the state to meet certain emission limits in 2020, 2035 and 2050. However, the consultant hired by Inslee's Climate Legislative and Executive Workgroup reported that the state "will not meet its statutory reductions for 2020, 2035 and 2050 with current state and federal policies."

The action plan calls for the following:

- Reduce carbon emissions through new cap-and-market program

  A Carbon Emissions Reduction Taskforce composed of 21 leaders from business, labor, health and public interest organizations will provide recommendations to the governor on design and implementation of a market-based carbon pollution program. Inslee directed the taskforce to consider measures to offset costs to consumers and businesses and to design strategies to help energy-intensive industries transition from carbon-based energy sources. Final recommendations are due November 21, 2014.

- End use of electricity generated by coal

  Several state agencies will work with key utilities to reduce, and eventually eliminate, the use of electrical power produced by coal. Coal-generated electricity accounts for most of Washington's electricity-related carbon emissions.

- Develop clean transportation options and cleaner fuels

  Cars, trucks and other transportation-related sources accounted for 44% of the state's total greenhouse gas emissions in 2010, with 23% coming from gasoline consumption. Analyses will help determine whether a clean fuel standard would work in Washington and how such a standard should be implemented.

- Accelerate development and deployment of clean energy technology

  The Department of Commerce will work with Washington State University (WSU) and others on creating a program to develop and deploy new technologies for renewable energy and energy efficiency as well as recommend proposals for funding. Inslee also asked the WSU Energy Program to work with the Department of Commerce, the Washington Utilities and Transportation Commission and others to craft recommendations for advancing development and deployment of solar power.

- Improve the energy efficiency of the places we work and live

  One of the most cost-effective strategies for reducing carbon emissions is to use energy more efficiently. The Department of Commerce will work with WSU and others to develop a smart building program to help homeowners, developers, businesses and governments significantly boost the energy performance of public and private buildings.

- Reduce state government's carbon footprint

  The Department of Enterprise Services will lead efforts to reduce carbon emissions and improve energy efficiency throughout state government. "Resource stewardship" in state government is also one of the goals outlined in Inslee's Results Washington, a performance management initiative.

National Climate and Energy Legislation

On June 2, 2014, at the direction of President Obama, the Environmental Protection Agency (EPA) proposed emission guidelines, the Clean Power Plan, for states to follow in developing plans to address greenhouse gas emissions (GHG) from existing fossil fuel-fired electric generating units (EPA press release, June 2, 2014). Specifically, the EPA is proposing state-specific rate-based goals for carbon dioxide (CO2) emissions from the power sector, as well as guidelines for states to follow in developing plans to achieve the state-specific goals. This rule, as proposed, would continue progress already underway to reduce CO2 emissions from existing fossil fuel-fired power plants in the United States.

By 2030, the steady and responsible steps the EPA is taking will:

- Cut carbon emissions from the power sector by 30% nationwide below 2005 levels, which is equal to the emissions from powering more than half the homes in the United States for one year.
- Cut particle pollution, nitrogen oxides and sulfur dioxide by more than 25% as a co-benefit.

The Clean Power Plan will be implemented through a state-federal partnership under which states identify a path forward using either current or new electricity production and pollution control policies to meet the goals of the proposed program. The proposal provides guidelines for states to develop plans to meet state-specific goals to reduce carbon pollution and gives them the flexibility to design a program that makes the most sense for their unique situation. States can choose the right mix of generation using diverse fuels, energy efficiency and demand-side management to meet the goals and their own needs. It allows them to work alone to develop individual plans or to work together with other states to develop multi-state plans.

Also included in the proposal is a flexible timeline for states to follow for submitting plans to the agency—with plans due in June 2016, with the option to use a two-step process for submitting final plans if more time is needed. States that have already invested in energy efficiency programs will be able to build on these programs during the compliance period to help make progress toward meeting their goal.

In the wake of several proposed pieces of hydropower legislation in recent years, one has been signed into law. The Hydropower Regulatory Efficiency Act of 2013, sponsored by Cathy McMorris Rodgers (R- WA), was enacted in August 2013. The law is intended to change some of the regulations in the U.S. surrounding hydropower by making it easier to develop smaller-output hydropower projects. It raised from 5,000 to 10,000 KW the size of hydropower projects that require certain licenses. The law supports hydropower development by: waiving license requirements for conduit hydropower facilities that 1) use for generation only the hydroelectric potential of non-federally owned conduit, 2) have a maximum installed capacity of 5 MW and 3) is not currently licensed or exempted from license requirements. It authorizes FERC to 1) exempt from license requirements any power generation facility that utilizes only the hydroelectric potential of a conduit and has an installed capacity of 40 MW or less and 2) extends the preliminary permit period for up to two years beyond the three years otherwise allowed if it finds the permittee implemented activities under the permit in good faith. It also directs FERC to investigate the feasibility of issuing licenses at nonpower dams and closed loop pumped storage projects and hold workshops and develop pilot projects. Additionally, it directs the Department of Energy to study the flexibility of existing pumped storage projects to support intermittent renewable generation, including being retrofitted with new technology and 2) the potential of existing and new pumped storage facilities to provide grid reliability.

Load Forecast

A refreshed 11-year econometric retail load forecast was developed for this Progress Report's 2014-2024 planning period. These low, base and high forecasts are prior to planned conservation savings. Future cost-effective conservation is considered as a resource for integrated resource planning purposes, so it can be evaluated on the same basis as other resources. Demographic trends and economic

conditions remain the primary drivers used to arrive at the forecasted retail electricity sales by sector. In addition, the resulting forecasts are an integration of economic evaluations and inputs from the District's own customer service planning areas. The District continues to study possible increases in per customer usage in the residential sector that may be the result of recent substantial increases in home electronics.

The growth percentages from the sum of the sector energy sales forecasts, with system losses added, were applied to the 2013 weather-normalized load to arrive at total projected megawatt-hours through the planning period. Since 2012, more information has become available and further study on system losses has occurred. As mentioned in the 2012 IRP, some system losses attributable to the generation of long-term power purchasers is being accounted for differently under the new long-term power purchaser contracts, having the net effect of increasing District retail load. Losses are now estimated at 3.5% of District retail load, an increase over historical amounts approximating 2.2%, but a decrease from the increased estimate to 4.6% used in the 2012 IRP. **The low, base and high average annual composite retail energy sales forecast growth rates, including system losses, otherwise known as the forecasted annual energy load growth rates, are .90%, 1.27% and 2.29%, respectively.** The low and high forecasts have increased some from the 2012 IRP while the base forecast has decreased slightly. The weather-normalized average annual rate of growth at the District (before the effects of cumulative conservation) was approximately 1.5% for the 10-year period from 2003-2013. The net of cumulative conservation growth percentage was approximately 1.0% for the same 10-year period. This historical net of cumulative conservation growth average is unchanged from the most recent 10-year periods reported in 2010 and 2012. The three forecasts for 2014-2024 as well as the actual weather-normalized total District energy load for 2002-2013 are presented in Chart 1.

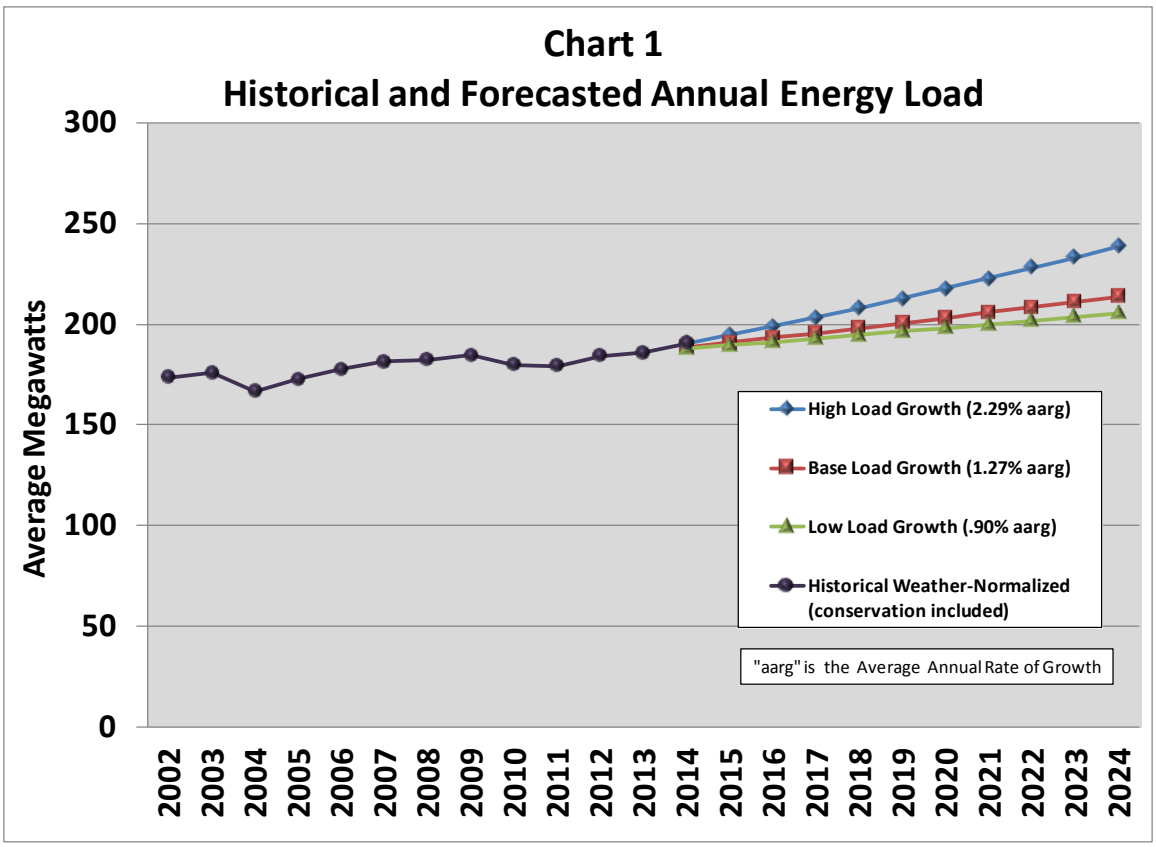
The NWPCC's Sixth Power Plan region-wide low, medium and high energy forecasts for the 2010-2020 period are .8%, 1.2% and 1.5%, respectively. The Sixth Plan's forecasts increase some for the 2010-2030 period at .8%, 1.4% and 1.8%, respectively. Like the District's forecasted annual energy load growth rates, these forecasts do not include any new conservation measures. When the District's 2016 IRP is developed, the Council's Seventh Plan, with updated energy load forecasts, will likely be available.

Sector Energy Sales

Demographic and economic data used for the load forecast was updated. The Washington State Office of Financial Management (OFM) released new Chelan County population projections in 2012. To update, the average annual rates of growth for population from the 2012 projections (low, base, high) were retained and applied to the OFM actual population estimate for Chelan County for 2013 to arrive at updated population estimates through the planning period. Additional actual Chelan County population data from the OFM (through 2013) was used to update the various sector regression analyses.

Residential load continues to be projected based upon population. For this load forecast, data for the regression analysis was updated to include only years since 2008 when the District purchased the City of Cashmere's distribution system and these energy sales became integrated with the sector loads for the entire county. As more years of per capita income become available, it will continue to be studied as another potential independent variable, along with population, to be used as a predictor of residential load.

The forecast low, base and high average annual growth rates for the residential sector have increased since 2012 (the base only very slightly) even though the low and base population growth forecasts have decreased. This is due to some increased projections regarding per customer usage (before the effects of conservation). The high population growth forecast has increased.



For this load forecast, the commercial sales forecast is a function of population only. For the same reason as the residential sector regarding the integration of Cashmere load data, limited years of data were available for the updated regression analysis. As more years of Chelan County sales revenues become available, it will again be studied as a potential independent variable, along with population, as a predictor of commercial load. It has been proven a statistically significant variable in the past. The low, base and high average annual growth rate projections for the commercial sector are split. The low is up very slightly due to a small increase in per customer usage (before the effects of conservation). The base has decreased in line with the lower base population growth forecast. The high has increased in line with the increased high population growth forecast.

Industrial loads can be very large and can come and go very quickly depending upon the industry, the local economy and much broader regional, national and global economic conditions. Industrial sales were again manually estimated based upon ranges of use per customer amounts and ranges of customer counts with some potential larger load additions.

Recently, the District has experienced some customer usage changes causing increases and decreases in the industrial sector that have been largely offsetting. Currently, the District is receiving requests for larger load placements known as Bitcoin mining. A Bitcoin is a digital currency made up of long, unique strings of digital characters. It's exchanged globally between those who collect it and those who accept it as payment. This forecast continues to assume no changes to the District's rate structure for industrial customers. The low, base and high average annual growth rates for the industrial sector have all decreased since the 2012 IRP due to decreases in the size of the larger load addition projections. The three industrial forecasts still represent the highest and broadest range of growth rates compared to the other sectors due to increased uncertainty about growth in relationship to the other sectors. Industrial sales are still estimated to increase just slightly as a percentage of the District's total load through the planning period, although to a lesser degree than in 2012, as residential and commercial sales and those falling into the "other" sector decrease slightly.

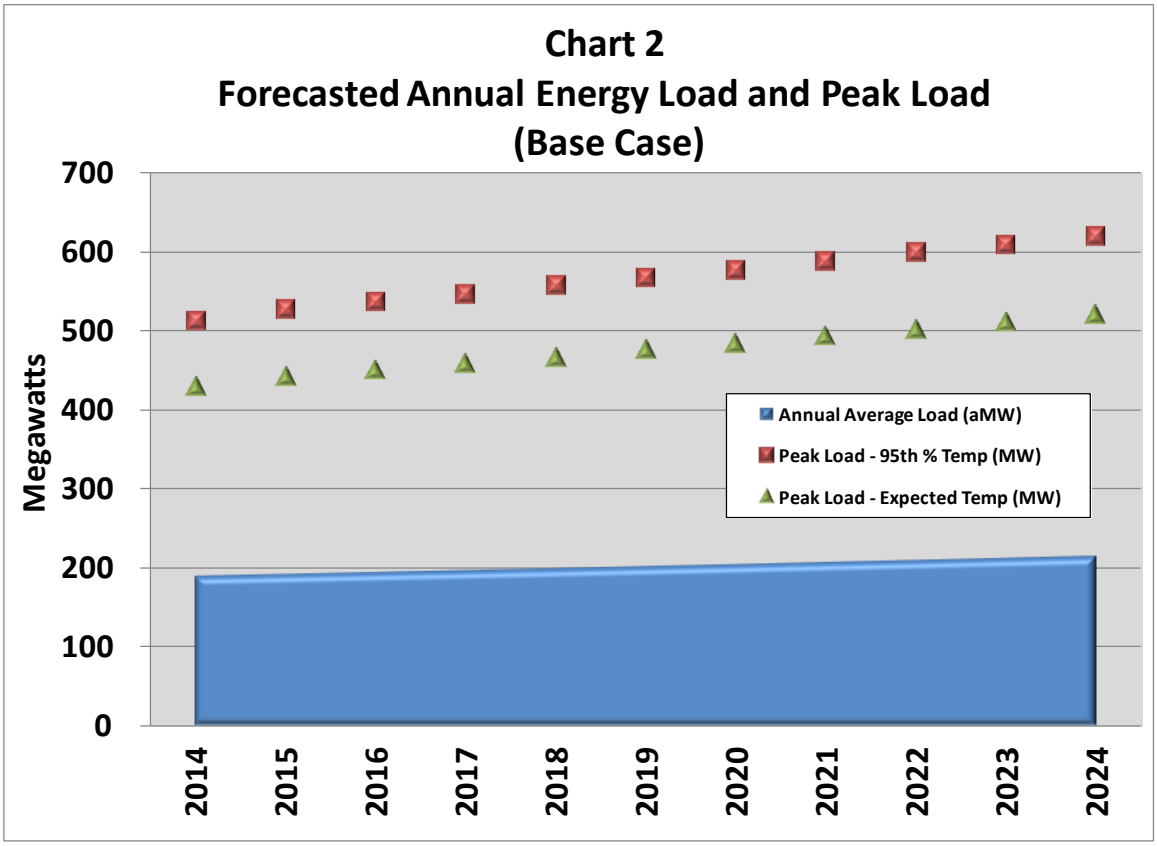
The aggregate of "other" energy sales (street lights, interdepartmental use, frost protection and irrigation) growth projections still remains at 0% for all three load cases. This sector was again manually projected based on ranges of use per customer and ranges of customer counts after looking at the subcomponents of this sector.

Peak Load Forecast

The peak load forecast was also updated to ensure the District has enough resources to meet peak demand, or the maximum one hour average system peak load. The District's peak retail load occurs in the winter. The all time high retail load peak occurred February 2014. The peak of 464 MW was established when the temperature was approximately 5.5 degrees Fahrenheit. This occurred on a weekday (Thursday) morning when peak demands are usually higher given business and other commercial needs.

This newly established peak gives the District a good look at potential future peaks under even more extreme temperature conditions.

Newly updated seasonal regression equations with temperature at time of peak as the independent variable were developed from recent peak hour load and temperature data to project peak load at a given temperature. The base average annual rate of growth from the energy forecast (shaped by month) was applied throughout the planning period. This resulted in an average annual peak load growth rate in January of 1.81%. This lines up closely with January peak growth rates over the last 10 years. Chart 2 illustrates both the base case annual energy load forecast with the base case peak load forecast at both an average, or expected, peak temperature and at a 95th percentile extreme peak temperature for 2014-2024.



Electric Vehicles (EVs)

The District began taking a close look at potential future electric vehicle (EV) retail load during its 2010 IRP Progress Report development. For these purposes, EVs include both plug-in hybrid electric vehicles and battery electric vehicles. For the 2012 IRP, the District relied on the same basic methodology and assumptions from the Council as it did in 2010.

After studying a breadth of still widely varying estimates and assumptions regarding EVs, the District continues to use the Council's basic methodology with one major assumption change. Based on EV market share, or penetration rates, experienced in the region and U.S. to date as well as publically available forecasts and professional judgment regarding the District's service area, the District reduced market share for EVs in its overall low, base and high load forecasts through the 2014-2024 planning period. By the end of the planning period, the rates vary from 5% to 20% in the three cases. These reduced market share estimates, in turn, reduced the corresponding forecasted EV load. The three cases now result in forecasts of between .24 and 1.14 aMW by 2024. Peak load estimates now range from .5 MW to 2.38 MW in 2024. For more detail regarding the Council's EV forecasting methodology and other assumptions used, see Chelan PUD's 2012 IRP.

The District will continue to monitor the development of the EV industry and its potential impact on future retail electric load in Chelan County.

Resources

Existing Portfolio

Chelan PUD's resource mix remains unchanged. The District owns and operates three hydroelectric projects, all located in Chelan County, and is a participant in the Nine Canyon Wind Project, located in Benton County, Washington. The three hydroelectric projects, Rocky Reach, Rock Island and Lake Chelan, together, have capacity to generate nearly 2,000 MW of power. The District continues to invest in modernization and relicensing at the projects to ensure reliable, locally-controlled operation of resources for future generations.

In late 2011, the make-up of long-term wholesale sales contracts at Rocky Reach changed substantially after 50 years of operations. Long-term contracts are currently in place with Douglas County PUD, Alcoa Power Generating Inc./Alcoa Inc. and Puget Sound Energy. District power contracts and the hedging strategy are more fully discussed in the Portfolio Analysis section.

Hydropower has many characteristics that make it highly desirable. It is free of the emissions associated with fossil fuel-fired generating resources. Operational flexibility allows hydropower to quickly follow load changes and provide reserves to the electric grid in a timely manner, which contributes to overall system reliability. In addition, hydropower provides backup for intermittent resources such as wind. The District avoids transmission availability issues, in relation to serving retail load, by using its own hydropower generation, which is located in Chelan County, near the District's retail load. The amount of hydropower the District is able to generate depends on water availability, which is variable and hinges on a number of factors, primarily snow pack in the mountains upstream of its hydroelectric facilities, precipitation in its watershed, the operations of upstream storage reservoirs, certain operating agreements and most recently, the operation of the immediate downstream reservoir from Rock Island belonging to the Wanapum Project.

In late February 2014, Grant County PUD discovered a two-inch-wide by 65-foot-long underwater crack in a concrete spillway pier at its Wanapum Project. In response to the crack, Grant PUD took immediate action to drawdown the reservoir behind Wanapum to relieve pressure on the structure and allow for further inspection. Grant PUD is working with internal and external experts, including FERC officials, to figure out the cause and extent of the damage and the best way to fix it.

The District is coordinating closely with Grant PUD during this event. The low river elevation below Rock Island is below normal operating levels and has been unprecedented, causing modified operations at Rock Island. In turn, the river level between Rock

Island and Rocky Reach was also lowered in order to be able to continue to operate a portion of the Rock Island generators safely within their design criteria. Rocky Reach generating capability has not been affected by the event. Chelan PUD is working with stakeholders to mitigate fish migration and irrigation challenges. At this time it is unknown how long below-normal water levels will continue and therefore all impacts to Chelan PUD are unknown.

In September 2013, three additional large generating units at Rocky Reach were taken out of service after discovering that the fourth large turbine, out of service since March 2013, had a deep crack in a stainless steel rod that delivers oil to a servo motor. The motor adjusts the angle of the turbine blades. The four units share the same design and were put into service between 1998 and 2002. After making interim repairs, including temporarily fixing the blade positions, all four units were back online in early 2014. Beginning in 2015, the units are planned to be taken out of service one at a time to make more permanent repairs with the goal of having all four units with long-term repairs completed by mid 2019. The remaining seven smaller units at Rocky Reach do not share the same design and will continue to operate.

More work is needed to refine estimates with respect to long-term repair alternatives and insurance recovery. There may also be revenue loss associated with the lost generation and insurance policies are being reviewed to determine what revenue loss and/or repair costs may be covered. However, based on currently available information, Chelan PUD does not anticipate the generating unit repairs and outages to result in any rate increase.

In late April of 2014, the Rocky Reach large unit C11 was removed from service for investigation of a possible fault in the generator stator winding. Testing revealed an internal strand to strand failure in the A phase of the generator's winding requiring the replacement of two full coils and five half coils for the final repair. Post repair testing on A, B and C phases has indicated no further damage in the stator winding and the unit returned to service in late June 2014.

Chelan PUD is scheduling forensic testing on the removed coils to determine the root cause of failure and to help determine the remaining life span of the generator winding as this failure occurred sooner than the typical expected life of a generator winding. The seven smaller units at Rocky Reach do not share the same design as C11. The other three large generating units are equipped with the same stator design as C11 and were installed in the same time stator replacement cycle. When the results from the forensic testing are complete, the District will develop a mitigation plan if it is believed the other large units have a similar generator stator winding strand issue.

The risk management plans Chelan PUD has in place are working very effectively. The long-term wholesale sales contracts and hedging program (discussed in the Portfolio Analysis section), insurance program and strong financial policies have significantly reduced the impact to the District from the lost generation revenue, repair costs, and associated risk mitigation efforts for the aforementioned operational challenges.

In 2011, Chelan PUD completed 11 years of juvenile salmon and steelhead survival testing at Rocky Reach for the project's Habitat Conservation Plan (HCP). Spring fish spill is not required at Rocky Reach until at least 2020 when additional spring studies may be required. Summer fish spill is required, at 9% of daily average river flow. Survival testing for juvenile summer Chinook remains to be completed at the 9% spill level but is awaiting development of appropriate fish-tag technology. No studies will occur in 2014-2015. The summer fish spill level will not change until testing can be completed.

Spring fish spill at Rock Island is expected to remain at 10% of daily average river flow through the next HCP spring survival confirmation study in 2020. Summer fish spill at Rock Island will remain at 20% until juvenile summer Chinook survival testing can be completed at the 20% spill level. No studies are expected in 2014-2015.

Columbia River Treaty

The 1964 Columbia River Treaty (Treaty) between Canada and the U.S. was based on the development and operation of dams in the upper Columbia River basin for power and flood control benefits in both

countries. The Treaty provides for the sharing with Canada of one-half of the downstream U.S. power and flood benefits and allows the operation of Treaty storage for other benefits. The Treaty has no expiration date, but operational elements of a basic feature of the Treaty, flood control, expire in 2024. Either party must provide 10 years notice for Treaty termination, so 2014 is a pivotal decision year.

In 2013, the Northwest and a variety of stakeholders endorsed the U.S. Army Corps of Engineers and the BPA's (collectively the U.S. Entity) final recommendation on the Treaty. The U.S. Entity oversaw a review that involved four states, 11 federal agencies and 15 Native American tribes and other stakeholders. The recommendation noted that "the region's goal is for the U.S. and Canada to develop a modernized framework for the Treaty that ensures a more resilient and healthy ecosystem-based function throughout the Columbia River basin while maintaining an acceptable level of flood risk and assuring reliable and economic hydropower benefits." A consortium of U.S. utilities has laid down negotiation markers that call for notification of termination if its principles are not met. A primary U.S. concern is the Canadian Entitlement, half of the originally calculated increase in U.S. downstream power benefits that is delivered to Canada. The utilities argue that the payment should be adjusted for diminished downstream benefits and the expense of subsequent U.S. environmental legislation imposed on the hydro system. The recommendation is now before the U.S. Department of State, and it is expected to release a U.S. position in the summer of 2014. The position is expected to be shaped by the U.S. Entity.

In March 2014, British Columbia, on behalf of Canada, released a 14-point position for updating the Treaty. Their principles include that the Treaty should primarily maximize benefits to both countries, the Canadian Entitlement currently does not account for all U.S. benefits or impacts to B.C., post-2024 flood control should include effective use of U.S. reservoirs and a coordinated flood risk management approach, ecosystems are an important consideration and adaption to climate change should be incorporated.

Climate Impacts Group (CIG)

The District continues to stay apprised of studies published by the Climate Impacts Group (CIG), which is located in Seattle at the University of Washington. Research at the CIG considers climate impacts ranging from local communities to the entire western U.S. region, with most work focused on the Pacific Northwest. They perform fundamental research and work with planners and policy makers to apply the information to regional decision making processes. In December 2013, the CIG released *Climate Change Impacts and Adaptation in Washington State*, following up on earlier research. New datasets have provided more refined results. Based on projected warmer temperatures and precipitation changes, hydropower production in the Columbia River basin, on average, for the 2080s, relative to 1917-2006, is expected to increase in the winter by 8% to 11% and decrease in the summer by 17% to 21% as more precipitation falls as rain rather than snow thus diminishing snowpack accumulation and runoff. Annual average cost of lost hydropower for 2030 (relative to 2010) is projected to be $120 million, although estimates range from a slight gain in revenue to much larger losses. Under the scenarios studied by the CIG, many water users could be adversely impacted, which also includes irrigators and fish.

Many of the larger basins contributing to the Columbia River basin are regulated by dam operations and other watershed management practices. Among the limitations of determining extreme flow risks using the methods applied in the CIG studies are the exclusion of management operations. The routed streamflows used to calculate these statistics do not consider the effects of management on flows, so the assessment reports only natural flood and low flow risks. Although the simulated streamflows do not represent absolute values of the actual flows in many of these watersheds, it is important to observe the relative streamflows (historical to future). The strength of these analyses lies in what the models indicate is the historical relative to the future simulated streamflows.

The U.S. Army Corps of Engineers, the Bureau of Reclamation, and the Bonneville Power

Administration collaborated on an assessment of climate change impacts on Columbia River basin hydrology and water management to support decisions on the Treaty and future biological opinions. The three federal agencies are integrating new climate change data derived from the CIG work into their ongoing modeling and planning efforts. Chelan PUD's response will depend significantly on how Grand Coulee reregulates flow changes. Therefore, it will be extremely difficult for the District to predict changes to its generation under a future climate change scenario. However, Chelan PUD will remain attentive to regional work on this issue as science and experience help shed light on the best methods for predicting water and snowpack inventories and reshaping flood curves.

As mentioned in 2012, Chelan PUD has evaluated the feasibility of several projects which could increase the ability of the region to adapt to climate change through the use of water storage, specifically a possible three foot increase in the reservoir behind Rocky Reach and an investigation of off-stream water storage opportunities adjacent to the District's existing hydroelectric projects. At this time, neither project is considered economically viable. However, Chelan PUD is prepared to revisit these projects should environmental and economic conditions warrant additional analysis.

Wind

The wind industry's first development boom came to and end in 2013. The Council reported in May 2013 that for the first time in more than a decade not a single wind project was under construction in the region. That changed in the fall, when Portland General Electric's $500 million Tucannon River Wind Farm near Dayton, WA started construction. 2013 may have marked the beginning of a lull in construction that might not end until the region's investor-owned utilities get back in the game to satisfy state RPS requirements, sometime around the end of the decade. Wind's nearly 13-year building boom forever changed the way the region's grid is managed. The Columbia River hydro system now serves multiple purposes: serving load, meeting non-power requirements (e.g., fish flows, irrigation, flood control and recreation) and supporting intermittent generation such as wind.

In the 2012 IRP, BPA's new Oversupply Management Protocol (OMP) was discussed. When river flows are high, extra water can be spilled from the dams so that it does not contribute to generation oversupply, but too much spill exceeds water quality standards and can harm fish and other aquatic species. If water cannot be spilled, it must be passed through the hydro turbines, thus generating electricity. Oversupply is most likely to occur at night when power demand is low, and in the springtime, when river flows and wind generation are high. In these conditions, BPA may need to implement the OMP, under which non-hydro generation is displaced to protect aquatic life and maintain system reliability. BPA then compensates generators for their displacement-related costs.

BPA has been working on a rate and a cost allocation methodology that will meet FERC's approval. In its original March 2012 OMP filing (Attachment P to its OATT), BPA proposed to allocate oversupply costs equally between power customers and generators that elect compensation under the OMP. In December 2012, FERC issued a ruling conditionally accepting the OMP contingent upon BPA's submitting a different cost allocation methodology within 90 days of the ruling. In February 2013, FERC granted BPA an extension of time to submit its compliance filing to within 30 days after the date that BPA files its OMP rate decision, as the proposed cost allocation methodology under the OMP is being developed through a rate case. In its revised cost allocation filing in March 2013, BPA proposed that oversupply costs are allocated to customers using the transmission system during periods of oversupply. Under this proposed framework, each of the users, including BPA Power Services, bears its proportionate share of the costs based on its level of use. Because BPA cannot recover any costs until FERC has approved a rate, BPA proposed that the oversupply rate be in effect from March 31, 2012 through September 30, 2015, to recover costs already incurred as well as future costs for the period the new rate would be in effect. In March 2014, BPA issued its Administrator's Record of Decision for the oversupply rate and cost allocation proceedings. BPA is currently awaiting FERC approval on the rate

and cost allocation. BPA recognizes that Attachment P is an interim solution and that the region will continue to work to find a long-term solution to oversupply. At the same time, extending Attachment P through the 2015 oversupply season provides BPA a level of certainty for the next three years, affords the region time to devise an alternative, and avoids the need for continued refiling of Attachment P with FERC.

In 2013, by legislative action, a new requirement was added to Washington State IRPs: an assessment of methods, technologies or facilities for integrating renewable resources and addressing overgeneration events, if applicable to the utility's resource portfolio. It must also include a description of how overgeneration events are mitigated at the lowest reasonable cost and risk to the utility and its ratepayers. An overgeneration event is defined as an event within an operating period of a balancing authority when the electricity supply, including generation from intermittent renewable resources, exceeds the demand for electricity for that utility's energy delivery obligations and when there is a negatively priced regional market.

The negatively priced regional market occurs, at times, when hydro and wind, which are very low variable cost resources (i.e., free fuel), are forced to the margin during periods of low load and high hydro and/or wind production. This results in very low or negative spot market prices. Negative spot market prices mean that a utility or other market participant has to pay another entity to take unwanted power (i.e., power for which no load exists). The negative pricing occurs for two primary reasons. Sometimes hydro generators are must-run due to operational constraints, thus adding additional energy to an over-supplied market. These are likely the conditions previously discussed in which BPA would initiate its OMP. Additionally, many wind generators receive federal incentive credits and/or payments based upon their amount of wind generation. They can also sell the RECs for this generation. The value of these items combined is somewhere in excess of $20/MWh. These generators can afford to withstand some degree of negative pricing and still make a profit due to these other payments. The federal Production Tax Credit (PTC) for certain wind producers and other renewable energy technologies expired at the end of 2013. For existing qualified wind generators and those that beat the deadline for beginning construction before the end of 2013, the PTC will provide a 2.3-cent per kilowatt-hour (kWh) incentive for the first ten years of the facility's operation.

Chelan PUD's share of Nine Canyon wind is a relatively small portion of its overall resource portfolio (less than 1%). In most cases, the District is able to integrate this wind operationally without issue due to its hydro resource reserves. The District may have to sell at negative prices when it has already reduced its hydro generation as much as possible under certain operating circumstances.

Energy Imbalance Market

A movement is underway to establish energy imbalance markets (EIM) to aid in this integration. At the end of 2012, the Northwest subregion of the Western Electricity Coordinating Council (WECC) had over 7,500 MW of wind, solar, geothermal and biomass capacity, and WECC anticipates over 13,000 MW by 2022.

The most developed EIM, a joint effort of the California ISO and PacifiCorp, is scheduled to begin operation in October 2014. The second, an undertaking by the Northwest Power Pool (NWPP), is still in a more exploratory mode, but a set of governance principles has been proposed. In principle, an EIM has a very limited, precise role in providing a sub-hourly, near real-time centralized dispatch of available generation. The theoretical benefit of EIM is to bring into play a much broader array of renewable generation than is currently available to most balancing authorities, taking on the centralized dispatch function of a balancing authority but doing so over a larger area and applying it only to real-time imbalances. The NWPP says "the core function of the EIM is to optimize the dispatch of the fleet of generating resources that must be already committed and more than sufficient to meet all load service, firm sales and ancillary service obligations. The EIM does not perform a day-ahead (or longer) unit-commitment process."

Utilities in the NWPP are grappling with several major issues in regards to the EIM initiative. There is

currently economic benefit from reserve sharing in the Northwest and participants want assurances that nothing would interfere with those existing benefits.

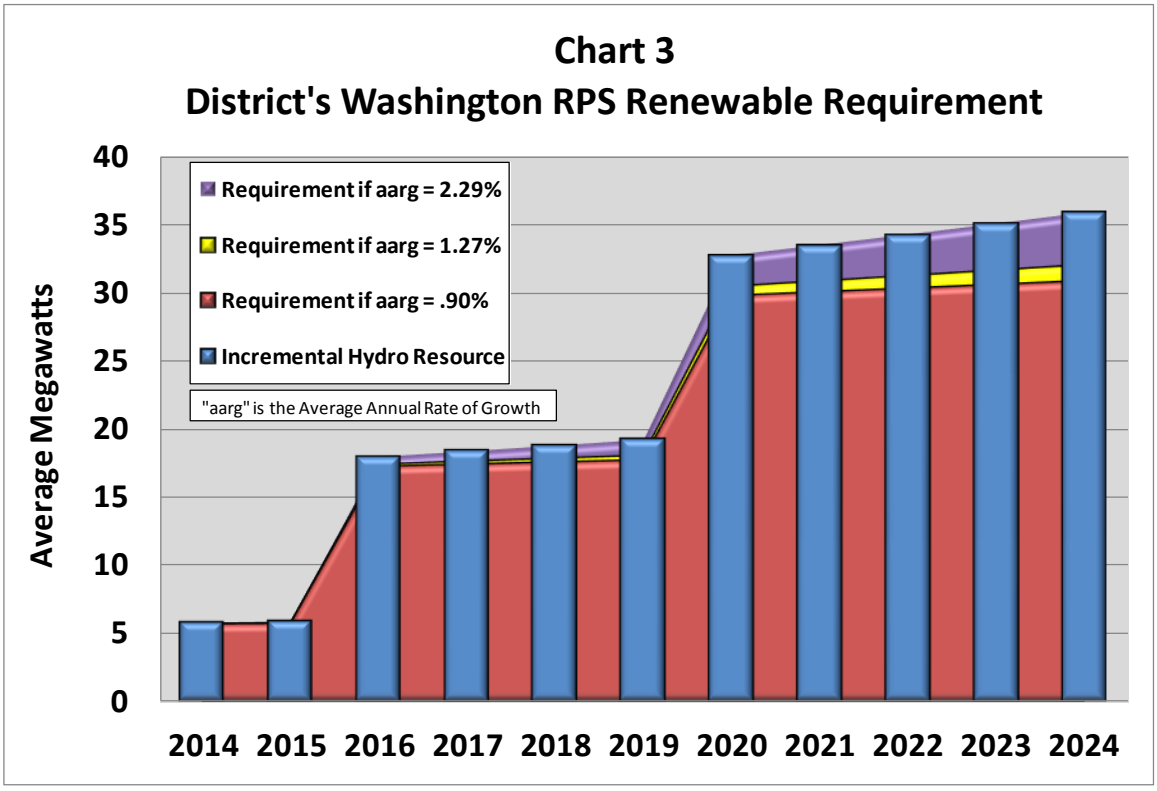
The District is actively participating in the NWPP EIM effort and will continue to assess the potential benefits that such a market would bring to the region and the District.

Renewables

The District began complying with Washington State RPS renewable requirements when it became mandatory in 2012. The renewable energy section of the initiative requires utilities to serve percentages of retail load, which increase over time, with eligible renewable energy, RECS or a combination of both. Most hydropower is not an eligible renewable resource under the Washington RPS statute, though certain efficiency gains resulting in incremental hydropower are eligible.

Chelan PUD's existing mix of generating resources complies with the District's understanding of the renewable requirement of the RPS throughout the planning period. The District plans on meeting these renewable requirements with incremental hydropower. Incremental hydropower is derived from efficiency gains at the District's existing hydropower projects resulting from equipment and operational upgrades, or increased power generation with the same amount of water. The District has made significant investments in equipment upgrades such as generator and turbine rehabilitations, new transformers and trash rack installations. In addition, the District has installed systems designed to optimize generation which have resulted in operational efficiency gains. Only those equipment and operational improvements placed in-service after March 31, 1999 qualify under Washington State RPS rules. The District uses a Hydro Optimization Model to calculate its qualified incremental hydropower under average water conditions.

Based upon the current base load forecast, the amount of renewable resources required will be approximately 5-6 aMW in 2014-2015, approximately 17-18 aMW in 2016-2019 and approximately 30-32 aMW in 2020-2024. Chart 3 shows the potential target requirements based on the District's three load forecasts.



The District continues to evaluate options to meet compliance requirements. For the purpose of evaluating the financial impact of the RPS, the District analyzes the cost of renewables as compared to its existing hydro resources. Because Chelan PUD is long resources relative to its retail load, the District's existing hydro resources are considered its "substitute resource" as defined by the Washington Administrative Code (WAC) rules that pertain to the RPS.

Legislative changes to the RPS were approved in March 2014. The definition of eligible renewable resources was again expanded to include hydroelectric generation from in-state wastewater, irrigation and domestic water pipes and irrigation canals. The generation must not result in new water diversions or impoundments.

In 2012, an advisory opinion process for eligible renewable resources was authorized to provide additional clarity and certainty. The District is utilizing this process to confirm incremental hydropower from both Rocky Reach and Rock Island is qualified under the Washington State RPS. The District is monitoring and evaluating the impact of these changes as appropriate.

The western renewable markets continue to evolve as compliance rules change and since renewable targets have become a reality for utilities. Chelan PUD is monitoring these renewable compliance markets and evaluating the potential impacts. The District continues to look for opportunities in both the voluntary and compliance renewable markets.

Conservation

Since 2010, Washington's RPS has required that "each qualifying utility pursue all available conservation that is cost-effective, reliable and feasible." The RPS defines conservation as any reduction in electric power consumption resulting from an increase in the efficiency of energy use, production or distribution.

Each utility shall establish a biennial acquisition target for cost-effective conservation that is no lower than the utility's pro rata share for the two-year period of the cost-effective conservation potential for the subsequent 10 years. Every succeeding two years, utilities must review and update their 10-year assessment. In January 2014, Chelan PUD submitted its most recent update. In June 2014, the District submitted its third annual conservation report to Commerce. The report documented the District's progress in 2012 and 2013 toward meeting the targets that were established in 2012 to comply with the RPS.

Even year reports are audited for RPS compliance by the Washington State Auditor. The District's June 2012 report was audited and met the requirements of the RPS.

There are two primary components of the RPS as it relates to conservation:

1. Documenting the development of conservation targets (i.e., setting the targets) and
2. Documenting the savings (i.e., demonstrating how the targets are being met).

Although the District used the Fifth Power Plan conservation calculator developed by the Council to set its original 10-year plan and two-year conservation target, it was decided in 2011 to use a utility-specific analysis, also known as a Conservation Potential Assessment (CPA) for the next biennium. Called Option 3 in the RPS, District staff determined this option provided the most accurate representation of the District's conservation potential.

The first CPA, conducted in 2011 by EES Consulting (EESC) for the District's 2012-2013 conservation targets and 2012 IRP, used Chelan County specific data on demographics and building construction to more accurately estimate local conservation potential. The CPA was developed in a manner consistent with the Council's methodology.

In February 2013, the District again retained EESC to update the CPA of Chelan County's conservation potential for the period of 2014 -2033. The CPA again used methodology in a manner consistent with the Council. In addition, new information gleaned from the Residential Building Stock Assessment, funded by the Northwest Energy Efficiency Alliance (NEEA) and conducted by Ecotope, Inc, garnered statistically valid data on Chelan County housing stock and demographics.

Table 1 2013 Conservation Potential Assessment Cost-Effective & Achievable Savings aMW				
Sector	**2 Year**	**5 Year**	**10 Year**	**20 Year**
Residential	.65	1.76	4.04	8.17
Commercial	.77	2.08	4.35	8.37
Industrial	.50	1.35	2.86	5.87
Distribution	.10	.52	1.53	3.73
Agriculture	.06	.16	.31	.31
TOTAL	**2.08**	**5.87**	**13.09**	**26.45**

The results of this updated CPA were used to establish the District's 2014-2015 conservation targets for RPS compliance. Also, the resulting conservation supply curves are used in the analysis of this Progress Report.

Conservation Potential Results

The District has pursued conservation and energy efficiency resources since the early 1980s. Historically, the utility offered several programs for both residential and non-residential applications. Industrial projects have dominated past conservation, however, beginning in 2010 and growing annually, there has been an increased emphasis on residential projects.

During the two-year period from 2012 through 2013, the District achieved the highest conservation totals in its history with 4.097 aMW saved. Of that total, the breakout was as follows: industrial 1.499 aMW, residential .93 aMW, District's share of the NEEA .75 aMW, commercial .876 aMW and agricultural .042 aMW.

The 2013 CPA provides estimates of energy and peak demand savings by sector for the period 2014-2033. The methodology complies with RCW 19.285.040 and WAC 194-37-070 section 6 parts (a)(i) through (xv) and is consistent with the methodology used by the Council in developing the Fifth and Sixth Power Plans.

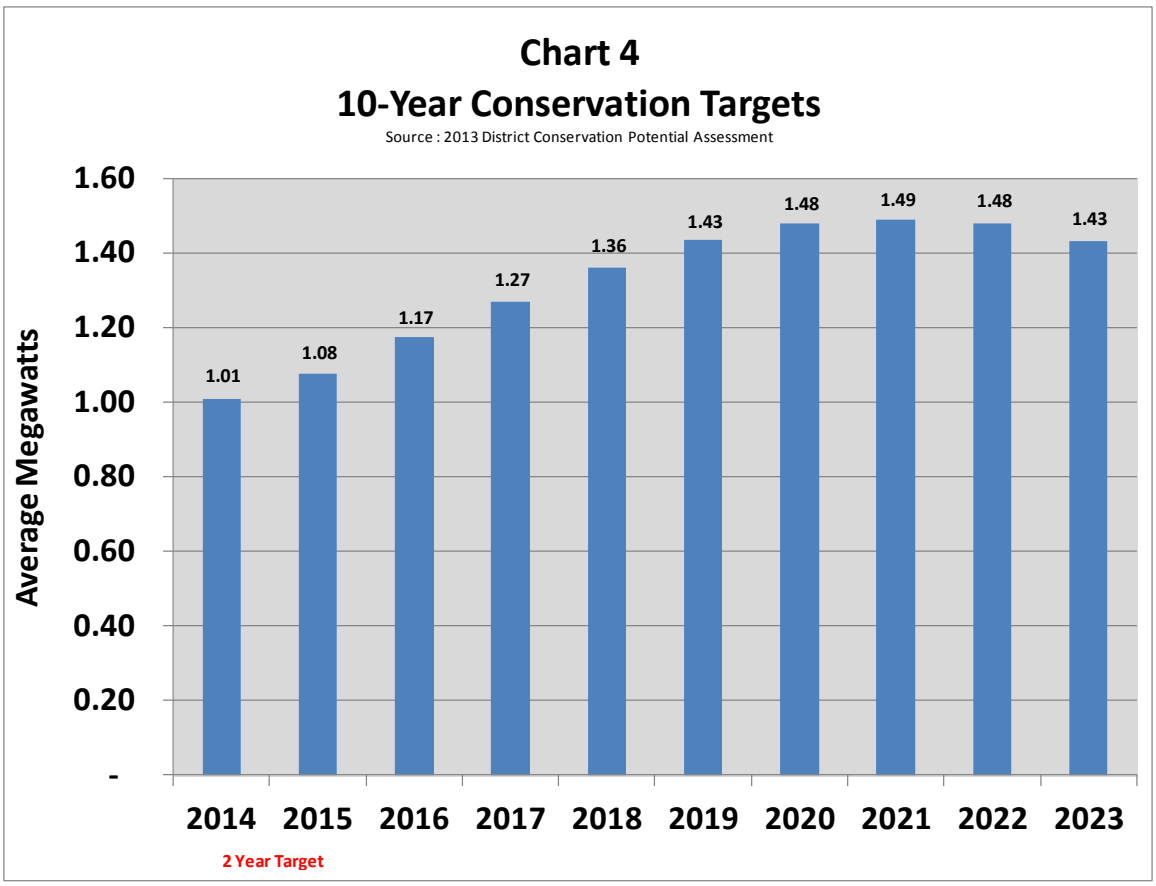
The assessment builds on the District's CPA conducted in 2011 by utilizing the same methodology and similar models. Significant changes in the marketplace have taken place since 2010, many of which were documented in the Council's Sixth Power Plan Mid-Term Assessment (March 2013). As a result, substantial revisions to the planning assumptions were required for this CPA. The primary baseline changes included the following:

- Lower avoided costs – the current market price forecast used for the avoided cost is much lower than the previous assessment.
- Code changes – significant impacts of recent code changes that have taken effect result in lower remaining potential (e.g., new lighting standards)
- Accounting for recent achievement levels included:
    - Internal programs, especially in the industrial sector
    - NEEA programs
- Revised/updated measure data from the Regional Technical Forum (RTF) is included
- Updated customer characteristics data are used
    - New housing data from the 2012 Residential Building Stock Assessment
    - New industrial sales/consumption by segment (2012)

The first step of this CPA was to carefully define/update the planning assumptions using the new data. The base case conditions were defined as the most likely market conditions over the planning horizon, and the conservation potential was estimated.

Table 1 shows the high-level results of this CPA. The economically achievable potential by sector in two, five, 10 and 20-year increments is included. The 10-year potential is approximately 13 aMW. The total 20-year energy efficiency potential is over 26 aMW.

Chart 4 illustrates the 10-year conservation potential and two-year target on an annual basis.



This CPA shows potential starting at just over 1.0 aMW in 2014 and ramping upward to approximately 1.4 aMW by 2021. Over the full 10-year planning period, the potential drops slightly the last two years due primarily to the completion of some measures.

This "ramping" effect was used in both the Council's Fifth and Sixth Power Plans and accounts for measures that aren't readily available in the early years of the planning horizon. For this CPA, most of these ramp rates were customized for Chelan PUD. The primary adjustments were related to the different starting year (Sixth Plan started in 2010 while this plan starts in 2014). Most of the Sixth Plan default ramp rates no longer make sense and would not be directly applicable to Chelan PUD. The general methodology and approach to setting the ramp rates is the same as it was for the Sixth Plan, but the specific input values were set based on local parameters.

Also embedded in these potential estimates are savings from regional market transformation efforts as well as new codes and standards. NEEA conducts region-wide market transformation efforts which will also impact savings in Chelan County. NEEA defines market transformation as "the strategic process of intervening in a market to create lasting change in market behavior by removing identified barriers or exploiting opportunities to accelerate the adoption of all cost-effective energy efficiency as a matter of standard practice." The District became a funding member of NEEA in January 2012 and can apply a pro-rata share of these regional NEEA savings toward meeting biennial targets.

Residential

In the residential sector, lighting savings drop off after the first year. This reduction is due to the changes to lighting codes and standards which effectively eliminated standard incandescent bulbs after 2014. Therefore, the traditional incandescent-to-CFL measure is not included after 2014. However, new lighting measures were added. The recent Northwest Residential Building Stock Assessment indicated that approximately one-third of all household light sockets are specialty sockets and are not covered by the new standard. These specialty

lighting applications make up the lighting potential in this CPA (specialty CFLs and LEDs).

The heat pump category includes heat pump conversions and upgrades. Water heating is also significant and includes low-flow showerhead replacements and efficient tank upgrades. Consumer electronics and appliances tend to have small per-unit savings, but larger numbers are available.

Commercial

Commercial savings for the 2014-2023 period are largely dominated by lighting measures. Commercial lighting has been impacted by the federal Energy Independence and Security Act of 2007 standard as well. The most notable change is the elimination of the T-12 measure. However, even in the Sixth Plan baseline and the prior assessment, the baseline assumption included very few T-12 lamps.

Other lighting applications such as street lighting, parking lot lighting and exterior building lighting are included.

Refrigeration and ventilation measures are the next two largest components of the commercial potential. The custom nature of commercial building energy efficiency is reflected in the variety of end-uses and corresponding measures.

Most of the commercial measures evaluated are those that were in the Sixth Plan. The RTF has made fewer updates to commercial measures than residential since 2010.

Industrial

In the industrial sector, a top-down approach is used to estimate the potential. Estimates of energy savings are calculated based on a fractional savings of end-use load.

Summing end-use savings across industry types gives total industrial potential. The industrial-sector analysis covers most of the region's non-DSI industries plus refrigerated warehouse storage. This CPA does not include savings estimates for the information technology sector (large-scale server facilities). The *Industrial Tool* Excel file was used directly for calculations to ensure consistency with methodology.

The largest portion of the industrial potential is in the refrigerated storage sector, which is consistent with its majority of the industrial energy consumption.

Agriculture

The irrigated agriculture sector is a small portion of Chelan PUD's load and therefore the energy efficiency potential is relatively small. There is some potential in upgrading irrigation hardware, which in turn reduces pumping energy. The two-year irrigation hardware upgrades potential is 0.063 aMW and the five-year potential is 0.156 aMW.

Distribution Efficiency Improvements (DEI)

Distribution efficiency measures improve the efficiency of utility distribution systems by operating in the lower end of the acceptable voltage range (120-114 volts). These results are based directly on the Sixth Power Plan and Chelan PUD's share of regional potential based on load. A detailed engineering assessment of Chelan PUD's DEI potential would be required for program planning and to refine savings potential estimates.

The ramp rates used for these measures were the same as the Council used in the Sixth Plan.

Cost

Energy saved in homes and businesses reduces the need to purchase higher-cost power on the wholesale market. Also, conservation provides additional resources that can be sold into the wholesale electric market when the District is already surplus to its own local retail load. Both cases, in turn, help keep local electric rates low.

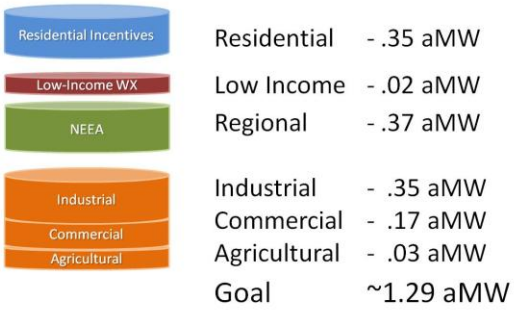
Budget costs can be estimated at a high level based on the incremental cost of the measures. If Chelan PUD spends 40% of incremental measure cost on incentives and has an overall administrative cost of 20% of measure cost, then it will need to spend approximately $3.02 million to acquire the CPA conservation in 2014 and 2015. There are many factors that could result in either higher or lower costs.

As mentioned previously, EESC utilized the utility-specific methodology as allowed by the RPS when completing the CPA. Chelan PUD utilized a forward broker market projection of wholesale market power prices as its avoided cost for the evaluation of the cost-effectiveness of potential conservation measures. The levelized cost for all conservation measures that resulted from the 2013 assessment was $17.83/MWh over the 2014-2033 period (2013 real dollars).

Current Demand-Side Offerings

The goal of Chelan PUD conservation programs is to offer diversified, cost-effective conservation programs that maximize the value to District ratepayers while striving to meet the RPS conservation targets. The District offers a variety of conservation programs to its customers. These programs include several rebates for residential customers, commercial funding assistance and industrial projects. Recent programs offered by the District are detailed below. The 2014 "stack" of expected energy savings is represented in Figure 1.

Figure 1- 2014 Conservation Program Stack



Insulation Rebates

For residential customers, the District pays 50 cents per square foot for added insulation. Requirements to qualify include: new insulation must increase the R-value by 10 or greater, existing attic insulation must be R-38 or less, floor insulation must be R-19 or less, wall insulation must be R-0, and only in-cavity insulation may be used.

Exterior Entry Doors, Window and Glass Door Rebates

Incentives are available to residential customers who replace older inefficient windows, and glass and substandard exterior entry doors.

This rebate offers customers:

- $8 per square foot on qualifying glass doors and windows. To qualify, new windows must have a U-factor of .22 or lower.
- $6 per square foot on qualifying glass doors and windows. To qualify, new windows must have a U-factor of .30 or lower. Qualifying glass doors must have a U-factor of .35or lower.
- $40 rebate per door for replacement of substandard entry doors with new Energy Star® rated insulated doors.

Multi-Family Window and Glass Door Rebates

- Incentives are available to residential multi-family apartment owners who replace older inefficient windows and glass doors. This rebate offers owners $4 per square foot on qualifying glass doors and windows. To qualify, new windows must have a U-factor of .30 or lower. Qualifying glass doors must have a U-factor of .35or lower.

Low-income weatherization

The District provides funds to the Chelan-Douglas Community Action Council (CDCAC) for low-income home weatherization. The District has partnered with the CDCAC to weatherize income-eligible electrically heated residences. Income eligibility is based on 200% of federal poverty guidelines. Chelan PUD offers an annual grant of $65,000, which is matched by the Washington State Energy Matchmaker program administered by the state Department of Commerce. CDCAC crews complete the weatherization measures which are inspected by the Department of Commerce and the District. In addition to the weatherization funding, CDCAC may install Ductless Heat Pumps in selected dwellings.

Retail buy-down of CFL and LED specialty bulbs, light fixtures and water efficient showerheads

The District buys down a portion of the cost of certain energy efficient specialty lamps, hard-wired fixtures, and showerheads sold in local retail stores. The District pays an incentive at the wholesale level and retailers agree to pass the savings on to customers in Chelan PUD's service area. This program is operated regionally by a third-party vendor.

Northwest Energy Efficient Manufactured Housing Program (NEEM)

Incentives of $850 are available to Chelan County residents who purchase and site in the county an Energy Star® or Eco-Rated manufactured home.

Energy Efficient Appliance Rebate Program

Several Energy Star® rated appliances and others qualified by the Consortium for Energy Efficiency (CEE) are eligible for rebates. Customers purchase qualifying products and submit an application and a copy of the receipt and model number. A third party vendor pays the incentive by check or gift card and invoices the District monthly. A partial list of qualifying products are:

- Heat pump water heater
- Electric storage water heater
- ES® refrigerator
- ES® freezer
- ES® clothes washer
- ES® LED downlight retrofit kit
- Air-source heat pump with 9.0 heating season performance factor and 14 seasonal energy efficiency ratio
- Electronic surge suppressors

Commercial Plan Review and Code Compliance

In 2006, the District reestablished a program originally operated in the mid 1990s to offer support to local building code jurisdictions by reviewing complex commercial building plans for energy code compliance and assisting, where requested by the code officials, with energy code-related construction compliance verification. This program has identified many potential noncompliance issues in plans and construction installation practices that have resulted in assuring achievement of lost opportunity (new construction) energy savings.

Energy Star® Portfolio Manager Support

The Portfolio Manager is an on-line software program that allows facility managers to monitor the energy consumption of their buildings and rate how they compare with similar buildings throughout the nation. Buildings receive an energy rating and can be certified as meeting Energy Star® standards if proven to be more energy efficient than 75% of comparable buildings in the portfolio manager database. Knowledge of a building's energy rating gives building operators the ability to concentrate their resources on the worst performing buildings and take steps to improve their facility's energy use rating. This program is now required (by RCW 19.27A) for public buildings in Washington State.

Refrigerator/Freezer Early Retirement and Recycling Program

The refrigerator/freezer early retirement and recycling program is a third-party vendor that collects and recycles old refrigerators and freezers to capture significant energy savings and environmental benefits. Appliances qualifying for the program include primary refrigerators and freezers displaced by new refrigerators and freezers, or older, working secondary refrigerators and freezers that many homeowners keep in a basement, garage or other storage space.

The primary goal of this program is to remove old refrigerators and freezers from customer homes and make sure they do not return to the Chelan County PUD area (or nearby regional) grid through donation, gifting, or resale.

A secondary goal of the program is to recycle the units collected through a process that captures all the hazardous materials and recycles as much material as possible (over 95%).

Resource$mart

Resource$mart is the District's program for helping commercial and industrial customers install energy efficiency equipment in their facilities by paying a portion of the up-front costs. The District can pay up to 75% of each energy efficient project. Measures include lighting projects, fast-acting doors on large refrigerated spaces, energy efficient fruit warehouse controlled atmosphere equipment, improved heating and cooling equipment and industrial tune-ups.

Next Steps

In March 2014, a legislative change was made to the RPS. Engrossed Substitute House Bill 1643 let utilities bank conservation in excess of a biennial target and use it to meet up to 20% of each of the next two targets. Banking was not previously allowed. Also, the law now provides a 5% banking bonus and increased the 20% cap to 25% for utilities using single, large-facility conservation savings, meaning savings during a biennium at the premises of a single utility customer consuming at least 5 MW prior to the conservation acquisition.

Chelan PUD already viewed the 2014-2015 conservation targets as a minimum goal and plans to exceed those targets. This legislation will give the District additional flexibility in future planning.

There are currently no industrial customers in the District's service area that use up to 5 MW of consumption. This is due to District electric rate structure that requires consumption greater than 5 MW be purchased on the wholesale market at market rates. As such, the 25% banking provision should have no impact on District industrial conservation achievements.

Portfolio Analysis

Chelan PUD is still long in terms of its resource position. The District is expected to be able to serve its retail load throughout the planning period (2014-2024) without adding new resources and is also expected to meet Washington State RPS renewable requirements through this period as well.

Additionally, Chelan PUD's resource portfolio is comprised primarily of carbon-free, base load, reliable, low-cost hydro resources. For all these reasons, as in prior analyses, no new resources were added to the portfolio of resources.

Portfolio Costs

The hydroelectric facilities' costs shown in Table 2 and Chart 5 represent all costs incurred, including debt service, operations and maintenance (O&M), taxes, reserve fund requirements, and contractual fees. The Nine Canyon cost is the District's power purchase contract payments to Energy Northwest.

The 2013 cost for the District's existing portfolio is shown in Table 2. These costs were calculated two ways. The second column, reading left to right, are the actual cost per megawatt hour based on actual costs and actual generation in 2013. Water runoff conditions were 104% of average in 2013. Wind conditions at Nine Canyon were below average at 87%. The column on the right was calculated using actual 2013 costs and average hydro and wind generation for any given year. This column illustrates what current costs are without the effects of runoff and wind variability. As seen in the table, cost per megawatt hour of generation can vary significantly depending upon actual generation. This is because almost all costs are fixed, that is, they don't vary with the amount of generation (e.g., debt service, taxes).

Table 2
District's Existing Portfolio Cost
2013

Project	$/MWh w/actual generation	$/MWh w/average generation
Rocky Reach	$15.06	$15.06
Rock Island	$32.89	$34.30
Lake Chelan	$26.90	$28.88
Nine Canyon	$71.78	$62.15

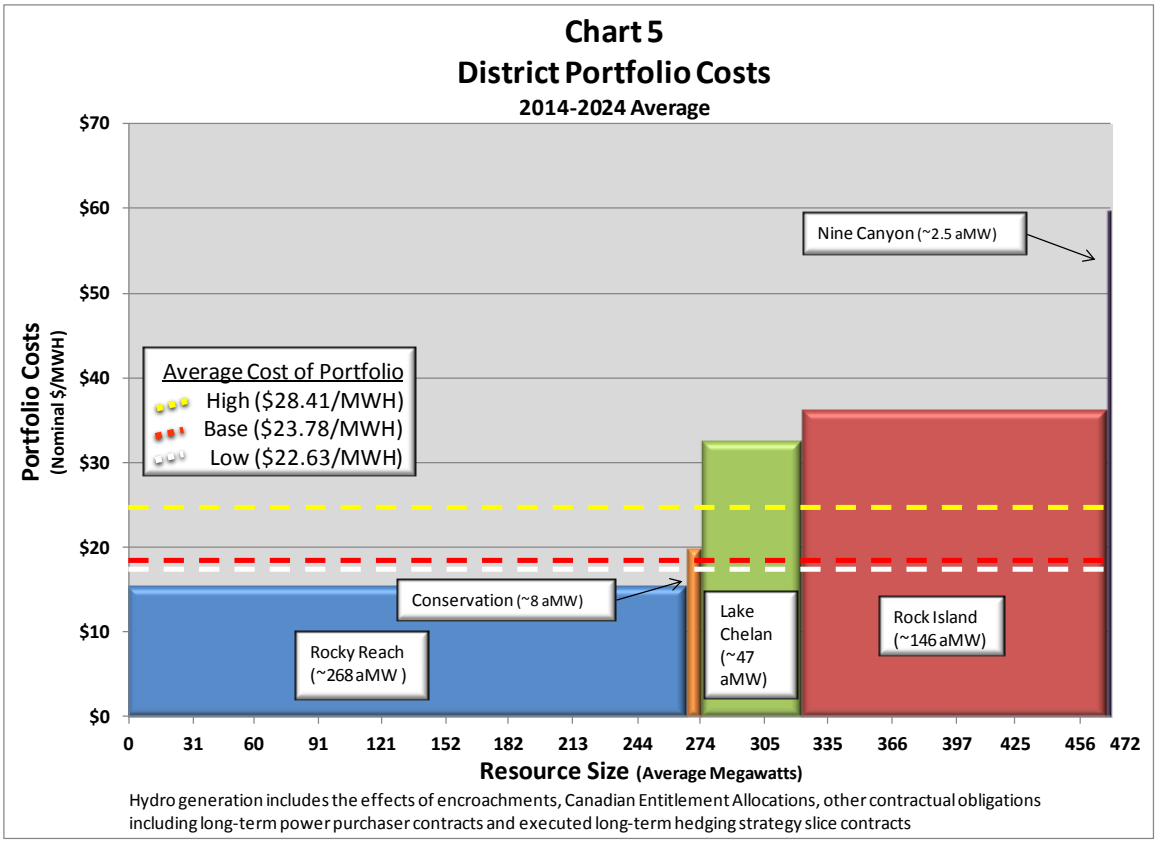


Chart 5 describes the projected base District portfolio costs by resource and relative size of each resource. To address the uncertainty in the District's hydro portfolio costs, two additional scenarios were developed along with the base costs' projection. The high scenario represents a 20% overall increase in hydro costs and the low scenario represents a 5% overall decrease in hydro costs. The weighted average cost of all resources under these scenarios are shown as dotted lines.

Hydro

The District forecasts the future costs of the hydro projects by compiling long-term operating plans and capital replacement programs, which are then incorporated into the forecasted debt service requirements of each facility. This cost-based activity is then adjusted to include other long-term power contract requirements to determine the overall cost of production.

Examples of long-term power contract requirements include, but are not limited to:

- Capital Recovery Charge (base scenario-50% of average annual capital expenditures)
- Debt Reduction Charge (base scenario-3% of outstanding project debt)

Examples of significant capital and/or operational requirements include, but are not limited to:

- Costs associated with license and habitat conservation plan implementation
    - Fish survival, hatchery programs, etc.
    - Plant rehabilitation and improvements

The forecasted hydro O&M costs for the base case scenario in this Progress Report consist of general cost growth rates for standard programs, while project-specific O&M such as unit overhauls, licensing, fish, hatchery and major park maintenance are accounted for with specific forecasts for each project. The average project O&M growth rates are:

- Rocky Reach 5.0%
- Rock Island 4.0%
- Lake Chelan 3.5%

Debt service is driven by existing debt schedules and forecasted financing needs that are driven by specific project capital requirements. In addition, the anticipated use of other long-term power contract requirements such as the debt reduction charge account and capital recovery charge account are included as offsets to future debt service needs.

Nine Canyon Wind

The projected future costs of production at the Nine Canyon Wind Project are taken from an annually updated budget that includes the next year and projected future years. The budget is developed by Energy Northwest in conjunction with project participants.

Since increasing approximately 70% in 2008 due to higher than expected maintenance and repair costs and the cessation of anticipated federal Renewable Energy Production Incentive payments, the cost of production rates have remained fairly stable. For fiscal year 2015, the rates for both Phases I and II are going to increase approximately 10% and are then projected to hold steady through 2023 at which time the Phase I and II debt is scheduled to be paid in full. Rates are then expected to decline by over 50% and hold steady through the remaining life of the purchase contract which expires in 2030. As was done in 2012 with original Phase II construction bonds, in early 2014, Energy Northwest was able to refinance Phase I bonds at a net present value savings of 8.6% to Phase I purchasers. These savings are taken into consideration in the rate changes just mentioned.

Hedging Strategy

As mentioned in previous reports, Chelan PUD has developed a comprehensive forward hedging strategy.

The District pursues the sale of market-based products such as slice contracts (i.e., a percentage share of project capacity and energy), block sales (i.e., a predetermined quantity of energy) and/or other products approved by the District's internal Power Risk Management Committee and outlined in its Power Risk Management Policy to help manage wholesale revenue risk and stabilize such revenue five years into the future. These contracts will have a maximum term of five years and can be executed up to one year in advance of a five-year term. Typically, the District uses a stair-stepped approached to hedging with more hedged in the current year and slightly less hedged in future years. As of mid 2014, slice and block contracts have been executed for as far out as 2019.

Portfolio Results

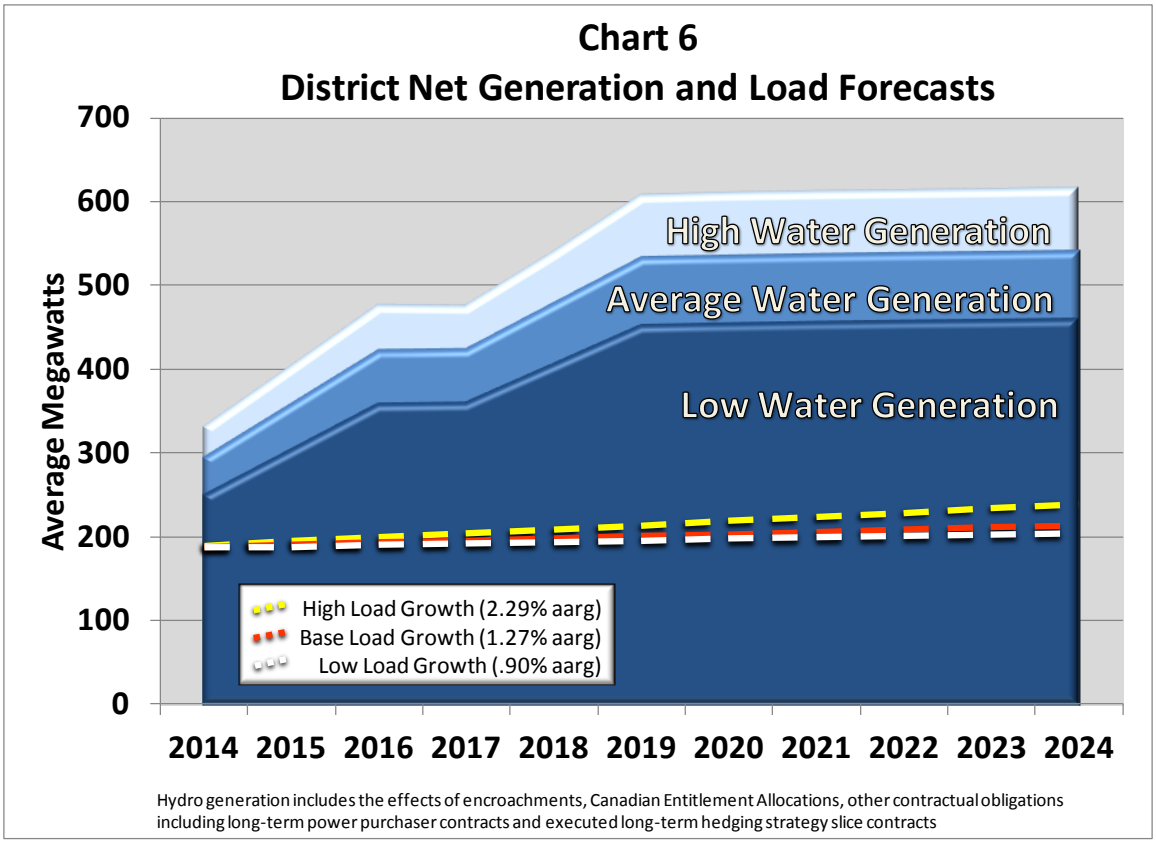
The District analyzes its forecasted portfolio of resources in relation to its load forecasts. The load/resource balance, service reliability and environmental impacts are all factors considered and evaluated.

Although it is not adding new resources, the District is focused on two major categories of risk which include uncertainties related to:

- Electricity usage by the utility's retail electric customers (loads)
- Stream flows that affect the availability of hydroelectric generation (volume and timing)

Load/Resource Balance

For this Progress Report, the District's existing mix of resources, at low, average and high levels of hydro generation, was stressed with the low, base and high load forecasts. Chart 6 represents each of these levels of generation and load projections. As mentioned previously, analysis continues to indicate that Chelan PUD is expected to be able to serve its retail load throughout the planning period without any new supply-side resource additions. The amount of demand-side resources included in this evaluation has decreased from what was included in the 2012 IRP to match Chelan PUD's 2014 required 10-year conservation plan submittal to Commerce that is approximately 1.31 aMW per year through the study period (based on the 2013 CPA previously discussed). Conservation has the effect of reducing the amount of renewable generation required under Washington's RPS because that requirement is based on a percentage of retail load.



More detail behind the District's load forecasts, resources and contracts can be found in Appendix A – Portfolio Detail & Assumptions.

Service Reliability

The District load/resource balance throughout the planning period was modeled using three hourly time periods per month. The load/resource balance showed that based on the new voluntary regional resource adequacy standard discussed previously, the District has adequate capacity and energy to meet its retail customers' load through the planning period thus providing for service reliability.

Environmental Impacts

The District's hydropower and wind generation do not produce any air emissions, but during certain hours of the year, depending upon load and hydro conditions, the District is a net purchaser in the wholesale power market. Those market purchases come from a "market mix" of different generating resources. Some of those resources produce air emissions. Table 3 shows Chelan PUD's calculated fuel mix for 2012, based on the amount of wholesale purchases the District made, as well as the overall Northwest Power Pool Net System Fuel Mix for 2012.

The cost of air emissions from CO2 remain an industry uncertainty. It is expected that any carbon-reducing regulations or other developments regarding climate change will affect the energy markets in which the District participates. Any proposed change to the District's mix of generating resources in the future would need to be evaluated for its environmental impacts.

Table 3 2012 Fuel Mix		
Generation Type	District Calculated Fuel Mix	NWPP Net System Fuel Mix
Biomass	0.10%	0.61%
Coal	5.74%	35.90%
Cogeneration	0.00%	0.00%
Geothermal	0.00%	0.00%
Hydro	91.53%	47.48%
Landfill Gases	0.02%	0.15%
Natural Gas	2.00%	12.40%
Nuclear	0.42%	2.61%
Other	0.03%	0.16%
Petroleum	0.06%	0.07%
Solar	0.00%	0.00%
Waste	0.10%	0.62%
Wind	0.00%	0.00%
TOTAL	100.00%	100.00%

Short-Term Plan

In its 2012 IRP, the District completed a "short-term plan" as required by RCW 19.280. The following is an update to the items listed in the 2012 short-term plan.

Conservation Resources

- Continue to develop conservation potential by refining demographic data for customer classes. UPDATE - In 2013, EESC updated a detailed CPA of Chelan County using new data developed locally since 2012 and the Residential and Commercial Building Stock Assessments, regional surveys conducted by Ecotope, Inc. for NEEA.
- Study available energy efficiency measures and programs. UPDATE - Chelan PUD joined NEEA in January of 2012 and is represented on the governing board. This partnership helped enhance the District's knowledge of energy efficiency programs and emerging technologies. In addition, the District educates itself through the Regional Technical Forum, BPA workshops, energy efficiency roundtables, and other avenues dealing with emerging technologies and by attending the NEEA/BPA Efficiency Exchange Conference. New measures are reviewed for cost-effectiveness, reliability and feasibility and the most promising are added to the list of prospective energy efficiency offerings.
- Evaluate conservation potential using automated metering technologies and rate design. UPDATE - The District used automated metering to verify energy efficiency and potential in the industrial sector, primarily fruit controlled atmosphere facilities. Evaluation of current and emerging efficiency technologies is ongoing.

  The District is exploring reducing connection fees as an incentive to build energy efficient structures.
- Look for economies of scale in conservation efforts with other utilities. UPDATE - The District participates in several NEEA and BPA-sponsored programs including Simple Steps Smart Savings energy efficient lighting and showerhead buy-downs, Smart Water Heat heat pump water heater program, Northwest Ductless Heat Pump Project, and Northwest Energy Efficient Manufactured Home Program. The District also grants funds to the Chelan-Douglas Community Action Council, which are used in conjunction with Commerce funds and federal funds to weatherize low-income residential properties, both single and multi-family.
- Refine and expand the District's in-house system to better track and report goals and conservation achievements. UPDATE – Since 2012, the District continued to use

staff resources in refining the in-house tracking and reporting tool. Updates to reports and processes have streamlined daily use and reporting. Current emphasis is to use the tracking system as an automated control tool for tracking accuracy of conservation data entry and reporting.

- Produce a business plan for conservation, including conservation targets to meet Washington State RPS. UPDATE – After extensive study of available conservation measures through the CPA process, the District used an in-house economic analysis tool to further evaluate potential programs. Several measures rose to the surface as having the most economic potential. A two-year target was then developed. A budget and 10-year plan to meet the RPS standards were proposed. The budget and conservation targets were presented as the "stack" to the District's Board and public through a public hearing process. The stack contained a broad array of conservation measures in the residential, commercial, industrial and agricultural sectors as well as a low-income component. During a public hearing on December 2, 2013, Chelan PUD's Board established a 10-year plan and two-year conservation targets as required under the RPS. This plan is the basis for the District's two, five and 10-year planning.

- Implement cost-effective conservation programs, which comply with requirements of the Washington State RPS. UPDATE – Energy efficiency programs approved for 2014 include residential weatherization, energy efficient lighting and showerhead retail buy-down, low-income weatherization, manufactured home duct sealing, ductless heat pump installation, energy efficient new manufactured home construction, energy efficient appliance rebates including air source heat pumps, refrigerator and freezer retirement and recycling, NEEA membership, commercial lighting incentives, irrigation pumps, commercial code review of new buildings and remodels, industrial lighting, industrial and commercial variable frequency drives, customer industrial and commercial projects, and industrial tune-ups. The two-year conservation target for 2014- 2015 is 2.08 aMW. New programs for this biennium are energy efficient new manufactured home construction, air source heat pump incentives, Energy Starr rated entry doors, ductless heat pumps for commercial buildings and high efficiency windows.

Resource Planning

- Continue to refine modeling and implementation of the hedging strategy utilizing the IRP model as well as other more granular, shorter-term modeling tools to inform the District about uncertainty in wholesale revenue and to focus on robust strategies that will return favorable results given different uncertain outcomes. UPDATE – The District has continued to improve its modeling and reporting capabilities in regards to wholesale power positions in the last couple of years in an effort to have more expedient and accurate forecasts for decision making.

- Study the fundamentals of the NWPCC's interim wholesale power price forecast expected to be released in 2012 including the price of natural gas, the cost of new generating resources, the potential cost associated with CO2 regulation, the development of RPS resources surplus to regional needs and regional energy and capacity reserve margin targets. UPDATE – The District elected not to model wholesale revenues for this Progress Report, but continues to study and understand the aforementioned fundamentals.

- Continue to study Council and Forum development, implementation and documentation on the new resource adequacy standard. Consider application in and ability to model in current and/or potential new District load/resource

modeling. UPDATE –The District continues to monitor the implementation of the latest voluntary resource adequacy standard. Although the District doesn't use a model specifically calculating a LOLP, the District load/resource balance throughout the planning period was modeled using three hourly time periods per month and has adequate capacity and energy to meet its retail customers' load through the planning period.

- Evaluate the change in how system losses are accounted for as contracts for long-term power purchasers change and the effect on District load is observable. Refine loss percentage in econometric load forecast model to accommodate for the effects of these changes. UPDATE –With more years of history under the new long-term power contracts, the District has been able to better analyze the effect of system losses on District load and refine such loss calculations.
- Continue to track climate change and other environmental legislation, federal, state and regional, and how they may impact the District's resource portfolio. UPDATE – With recent state executive action and new federal proposed regulations both targeted at reducing carbon emissions, the District is in a wait-and-see position with regards to how cap-and-market programs may develop and any opportunities that may bring to the District with its carbon-free portfolio of generating assets.
- Continue to monitor for any changes to the Washington State RPS that may impact the District's renewable portfolio. UPDATE – Although changes to the law have increased the number of allowable renewables, none currently have a direct affect on Chelan PUD. The District is utilizing an advisory opinion process for eligible renewable resources to provide additional clarity and certainty regarding the District's incremental hydropower.
- Continue to review emerging research and regional discussions regarding the impact of climate change on regional hydrology and the potential effect on the District's future hydro generation. UPDATE – As discussed, it will be difficult for the District to evaluate future impacts without knowing how Grand Coulee will reregulate potentially changing streamflows. This District will continue to monitor CIG and others as science and experience help determine the best methods for predicting water and snowpack inventories and reshaping flood curves.
- Continue to observe the impact of increasing amounts of wind capacity and generation on the regional power grid and effect on reliability, reserves and wholesale power market prices. In conjunction, monitor the development and implementation of BPA's Oversupply Management Protocol and its effect on the aforementioned elements. Consider the effect on the District's risk associated with any of those elements. UPDATE –The District continues to monitor the effects of increasing wind in the region. Based on the District's resource position and analysis, its own risks related to reliability and reserves are minimal. However, seasonal price risk during overgeneration events remains a somewhat higher risk for the District that is continually monitored and mitigated through the hedging strategy.
- Continue to monitor the growth of EVs in the automobile marketplace and their presence in Chelan County as well as applying the latest in technical developments to the modeling of projected EV load in the District's service territory. UPDATE –For modeling EV load in this Progress Report, the District continued to use Council methodology, however, EV market share rates were lowered based on industry experience. Based on the District's current analysis, the potential impacts remain very minimal during the planning period.

Final Remarks

Chelan PUD intends to retain its existing supply-side resources while implementing its 2013 CPA results. Complying with both the renewable resources and conservation portions of the Washington State RPS remains a significant focus as the District utilizes an advisory opinion process for eligible renewable resources to provide additional clarity and certainty. The District will continue to monitor uncertain variables that affect its load/resource balance, including available stream flows, recently made more challenging with the Wanapum Project reservoir drawdown, and District load. Additionally, the District will continue to evaluate and implement its hedging strategy to help reduce the risks associated with these and other uncertainties.

Chelan PUD will publish a new IRP in 2016.

Appendix A – Portfolio Detail & Assumptions

Resources

Hydro

- To represent the stream flow uncertainty, historical monthly re-regulated stream flow data, 1929-1997, supplied by PNUCC and actual hydro project data from 1998-2011 was grouped together to create average, low and high stream flow scenarios. The average scenario is the average of the entire dataset, the low scenario is the bottom 20% percentile and the high scenario is the top 20% percentile. The monthly values in each scenario were then allocated to each hour using normalized historical hourly flow values.
- A model that is informed with system constraints (capacity, pond limits, outage estimates, etc.) is used to convert the hourly stream flow estimates into generation.
- For each month, three time periods are modeled; one representing Monday – Friday, one representing Saturday and one representing Sunday. The model requires hourly inputs for each time period. The model optimizes the generation within each time period. The outputs are then aggregated up to a monthly and annual granularity for reporting.
- Generation is net of all project obligations (i.e., Canadian Entitlement Allocations (CEAs) and encroachments).
- Rocky Reach – Chelan PUD's share (net of long-term purchaser contracts and executed slice contracts)
    - 21.46% -1/2014 through 12/2014
    - 27.46% -1/2015 through 12/2015
    - 33.46% -1/2016 through 12/2017
    - 38.46% -1/2018 through 12/2018
    - 43.46% -1/2019 through 12/2024
- Rock Island – Chelan PUD's share (net of long-term purchaser contracts and executed slice contracts)
    - 27% - 1/2014 through 12/2014
    - 33% - 1/2015 through 12/2015
    - 39% - 1/2016 through 12/2017
    - 44% - 1/2018 through 12/2018
    - 49% - 1/2019 through 12/2024
- Lake Chelan – Chelan PUD's share
    - 100% - 1/2014 through 12/2024

Wind

- All available historical Nine Canyon hourly wind generation (2004-2013) was used to calculate average energy

Conservation

- Used the quantities from the 2013 CPA (also used for RPS compliance in January 2014)

Contracts

Long-term Power Sales

- Rocky Reach
  - Puget – 25% - 1/2014 through 12/2024
  - Alcoa – 26% - 1/2014 through 12/2024
  - Douglas – 5.54% - 1/2014 through 12/2024
- Rock Island
  - Puget – 25% - 1/2014 through 12/2024
  - Alcoa – 26% - 1/2014 through 12/2024

Executed Slices of Rocky Reach & Rock Island

- Executed "slice of the system" contracts as part of long-term hedging strategy
- Slice contracts represent between 0% and 22% of the capacity and energy of Rocky Reach and Rock Island from 2014-2024
- Slice contracts are removed from Chelan PUD's shares of Rocky Reach and Rock Island listed under "Resources" above

Load

- The three load forecasts represent average annual rates of growth of :
  - .90% - low, 1.27% - base, 2.29% - high

Table 4 shows the District's average annual resources for the planning period. The generation is the amount available to serve load under normal hydro conditions and includes the effects of encroachments, fish and other spill, CEA's, the long-term power purchaser contracts and the executed slice contracts.

Table 4
District's Average Annual Resources (aMW)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Net Rocky Reach Gen	152	195	238	237	274	309	309	309	309	309	309
Net Rock Island Gen	91	111	131	131	148	166	166	166	166	166	166
Net Lake Chelan Gen	47	47	47	47	47	47	47	47	47	47	47
Net Nine Canyon Gen	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Conservation	1.01	2.08	3.26	4.53	5.89	7.33	8.81	10.30	11.78	13.21	14.57

Appendix B – Washington State Electric Utility Integrated Resource Plan Cover Sheet 2014

	Base Year			5 Year Estimate			10 Year Estimate		
Estimate Year		2013			2019			2024	
Period	Winter	Summer	Annual	Winter	Summer	Annual	Winter	Summer	Annual
Units	(MW)	(MW)	(MWa)	(MW)	(MW)	(MWa)	(MW)	(MW)	(MWa)
Loads	429.00	233.00	185.78	475.30	247.87	200.53	520.02	261.32	213.70
Exports									
Resources:									
Future Conservation/Efficiency				12.29	8.99	7.33	24.64	17.86	14.57
Demand Response				20.00	20.00	0.00	20.00	20.00	0.00
Cogeneration									
Hydro	454.00	306.00	195.00	858.00	564.00	361.00	858.00	564.00	361.00
Wind	0.00	0.03	2.14	2.21	0.37	2.22	2.21	0.37	2.22
Other Renewables									
Thermal - Natural Gas									
Thermal - Coal									
Net Long Term Contracts									
Net Short Term Contracts									
BPA									
Other									
Imports									
Distributed Generation									
Undecided									
Total Resources	454.00	306.03	197.14	892.50	593.36	370.55	904.85	602.23	377.79
Load Resource Balance	25.00	73.03	11.36	417.20	345.49	170.02	384.83	340.91	164.09

The following notes help to describe the numbers in the table above.

- Requirements
  - Loads
    - Peak and annual energy loads are based on the District's Base Load Growth Forecast.
    - Peak and annual energy loads, including the base year (2013), are adjusted for normal weather (i.e. an expected or 1 in 2 peak).
    - Peak and annual energy loads, including the base year (2013), do not include conservation savings.
- Resources
  - Hydro
    - For all years, it was assumed that during a single hour winter peak demand period, all projects would be at full seasonal capability. For all years, it was assumed that during a single hour summer peak demand period, 1936-37 PNUCC critical period generation was available to all projects. Values reported are net of encroachments and CEAs.
    - For all years, annual energy was calculated by using 1936-37 PNUCC critical period generation data. Values reported are net of encroachments and CEAs.
    - For all years, hydro is reported net of long-term purchaser contracts and executed slice contracts.
  - Wind
    - Base year (2013) wind data reflects actual Nine Canyon experience in that year.
    - 2019 and 2024 projected peak wind capacity is based on median (50th percentile) hourly Nine Canyon historical generation (2004-2013).
    - 2019 and 2024 projected average annual wind energy is based on median (50^{th} percentile) average annual energy from Nine Canyon historical generation (2004-2013).

Acronyms

aarg	Average Annual Rate of Growth
aMW	Average Megawatt
APGI	Alcoa Power Generating, Inc.
BPA	Bonneville Power Administration
CDCAC	Chelan-Douglas Community Action Council
CEA	Canadian Entitlement Allocation
CEE	Consortium for Energy Efficiency
CFL	Compact Fluorescent Lamp
CIG	Climate Impacts Group
CO2	Carbon Dioxide
CPA	Conservation Potential Assessment
DEI	Distribution Efficiency Improvements
DR	Demand Response
EESC	EES Consulting, Inc.
EIM	Energy Imbalance Market
EPA	Environmental Protection Agency
EV	Electric Vehicle
FERC	Federal Energy Regulatory Commission
GHG	Greenhouse Gas
HCP	Habitat Conservation Plan
IRP	Integrated Resource Plan
KW, kWh	Kilowatt, Kilowatt-hour
LED	Light-Emitting Diode

LOLP	Loss of Load Probability
Mid-C	Mid-Columbia
MW, MWh	Megawatt, Megawatt-hour
NEEA	Northwest Energy Efficiency Alliance
NEEM	Northwest Energy Efficient Manufactured Housing Program
NWPCC	Northwest Power and Conservation Council
NWPP	Northwest Power Pool
O&M	Operations and Maintenance
OFM	Office of Financial Management (Washington State)
OMP	Oversupply Management Protocol
PNDRP	Pacific Northwest Demand Response Project
PTC	Production Tax Credit
PUD	Public Utility District
RAAC	Resource Adequacy Advisory Committee
RCW	Revised Code of Washington
REC	Renewable Energy Credit
RPS	Renewable Portfolio Standard
RTF	Regional Technical Forum
WAC	Washington Administrative Code
WECC	Western Electricity Coordinating Council
WSU	Washington State University

Glossary

Average Annual Rate of Growth (aarg)

The average percentage increase in value of a given item over the period of a year. The energy load forecast is referred to in terms of the average annual rate of growth.

Average Megawatt (aMW)

A unit of energy for either load or generation that is the ratio of energy (in megawatt-hours) expected to be consumed or generated during a period of time to the number of hours in the period (total energy in megawatt-hours divided by the number of hours in the time period).

Avoided Cost

The marginal cost that a utility avoids by not having to acquire one more unit of power whether by producing the power from owned resources, building new resources or purchasing it from another entity.

For evaluating future energy acquisitions, including conservation, Chelan PUD uses a forecast of wholesale power market prices as its avoided cost measure due to its surplus energy resource position.

Base Load Generation Resource

Electric generation plants that run at all times, except in the case of repairs or scheduled maintenance, to at least cover a minimum level of demand on an electrical supply system that exists 24 hours a day through the year.

Battery Electric Vehicle

A vehicle that uses only batteries as the source of energy to move the vehicle.

Biomass Resource

Any organic matter which is available on a renewable basis, including forest residues, agricultural crops and waste, wood and wood wastes, animal wastes, livestock operation residue, aquatic plants and municipal wastes. Resulting biogas is recovered and burned for heat and energy production. These biofuels are considered to be short-term "CO2 neutral", meaning they typically remove CO2 from the atmosphere and give up the same amount when burnt.

Block Power Sales

A power sales contract that establishes a fixed amount of energy to be sold for a specific period of time at a fixed price.

Canadian Entitlement Allocations (CEAs)

Energy returned to Canada to fulfill the obligation under the Columbia River Treaty between Canada and the United States for additional water storage constructed in Canada to help regulate hydroelectric generation. Canada is entitled to one half the downstream power benefits resulting from Canadian storage under the treaty.

Capacity

The maximum amount of power that a generator can physically produce.

Chelan PUD

In this report, all these references mean the legal entity of Public Utility District No. 1 of Chelan County. It is also referenced as the "District".

Climate Change

Any long-term significant change in the "average weather" that a given region experiences. It involves changes in the variability or average state of the atmosphere over durations ranging from decades to millions of years.

Cogeneration

The production of electricity using waste heat (as in steam) from an industrial process or the use of steam from electric power generation as a source of heat.

Conservation

Any reduction in electric power consumption that results from increases in the efficiency of energy use, production, transmission or distribution (from RCW 19.280: Electric Utility Resource Plans and RCW 19.285: The Energy Independence Act).

Conservation Potential Assessment (CPA)

A study designed to estimate the potential for electricity conservation in a given geographical area.

Council

See Power Plan (Fifth, Sixth, etc.)

Demand

The rate at which electric energy is delivered to or by a system at a given instant; usually expressed in megawatts.

Demand Response

Changes in electric usage by end-use customers (e.g., residential, commercial, industrial) from their normal consumption patterns in response to changes in the price of electricity, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized.

Demand-Side Resource

Peak and energy savings from conservation measures, efficiencies and load control programs that are considered a resource because they serve increased demand without obtaining new power supplies.

Dispatchable Resource

A resource whose electrical output can be controlled or regulated to match the instantaneous electrical energy requirements of the electric system.

Distribution System

The utility facilities and equipment that distribute electricity from convenient points on the transmission system to the end-use customer.

District

See Chelan PUD.

Econometric

The application of mathematical and statistical techniques to economics in the analysis of data and the development and testing of theories and models.

Electric Vehicle (EV)

A broad class of vehicles that are powered, at least in part, by rechargeable batteries that can be restored to full charge by connecting a plug to an external electric power source. A plug-in hybrid electric vehicle (PHEV) shares the characteristics of both a conventional hybrid electric vehicle, having an electric motor and an internal combustion engine, and of a battery electric vehicle (BEV), which uses batteries as its only source of energy to move the vehicle. The combustion engine in a PHEV works as a backup when the batteries are depleted.

Eligible Renewable Resource

a) Electricity from a generation facility powered by a renewable resource other than fresh water that commences operation after March 31, 1999, where: (i) The facility is located in the Pacific Northwest; or (ii) the electricity from the facility is delivered into Washington state on a real-time basis without shaping, storage, or integration services; b) Incremental electricity produced as a result of efficiency improvements completed after March 31, 1999, to hydroelectric generation projects owned by a qualifying utility and located in the Pacific Northwest or to hydroelectric generation in irrigation pipes and canals located in the Pacific Northwest, where the additional generation in either case does not result in new water diversions or impoundments; c) Qualified biomass energy; and d) For a qualifying utility that serves customers in other states, electricity from a generation facility powered by a renewable resource other than freshwater that commences operation after March 31, 1999, where: (i) The facility is located within a state in which the qualifying utility serves retail electrical customers; and (ii) the qualifying utility owns the facility in whole or in part or has a long term contract with the facility of at least twelve months or more. (from RCW 19.285: The Energy Independence Act).

Encroachments

When a downstream hydro project is built and increases the tail water elevation of an upstream hydro project, capacity and energy of the upstream hydro project is reduced. To compensate for the loss of capacity and energy, the downstream project delivers energy to the upstream project.

Energy Independence Act

Refers to RCW 19.285, a ballot initiative passed in Washington State in November, 2006. It is otherwise known as the Washington State Renewable Portfolio Standard (RPS.) Under the initiative, utilities with a retail load of more than 25,000 customers are required to use eligible renewable resources or acquire equivalent RECs, or a combination of both, to meet 3% of load by January 1, 2012, 9% by January 1, 2016 and 15% by January 1, 2020. The initiative also required that by January 1, 2010, utilities evaluate conservation resources using methods consistent with those used by the NWPCC and pursue all conservation that is cost-effective, reliable and feasible. Each utility must establish and make publicly available a biennial acquisition target for cost-effective conservation.

Fifth Power Plan

See Power Plan (Fifth, Sixth, etc.)

Fossil Fuels

They are hydrocarbons found within the top layer of the Earth's crust.

Geothermal Resource

Energy from rock and/or water that is heated by contact with molten rock deep in the earth's core. The heat can be extracted and used for space heating or to generate electricity.

Greenhouse Gas (GHG)

Gases that are present in the earth's atmosphere which reduce the loss of heat into space and therefore, contribute to global temperatures through the "greenhouse effect".

Hedging

Establishing positions in the wholesale power markets with the intent of reducing financial risk resulting from uncertain fluctuations in all the variables that affect the District's net wholesale power revenue, of which stream flows, retail load and wholesale power market prices are primary drivers.

Hydro Resource

Facilities used to produce electricity from the energy contained in falling water (river, locks or irrigation systems).

Incremental Generation

Electricity produced as a result of efficiency improvements completed after March 31, 1999, to hydroelectric generation projects owned by a qualifying utility and located in the Pacific Northwest or to hydroelectric generation in irrigation pipes and canals located in the Pacific Northwest, where the additional generation in either case does not result in new water diversions or impoundments (from RCW 19.285: The Energy Independence Act).

Integrated Resources Plan (IRP)

An analysis describing the mix of generating resources and conservation and efficiency resources that will meet current and projected needs a the lowest reasonable cost to the utility and it ratepayers (from RCW 19.280: Electric Utility Resource Plans).

Intermittent Resource

An electric generator that is not dispatchable and cannot store its fuel source, and therefore, cannot respond to changes in system demand.

Kilowatt (kW) and Kilowatt-Hour (kWh)

One thousand watts; the standard measure of electric power consumption of retail customers. A kilowatt-hour (kWh) is a measure of electric energy equal to one kilowatt of power supplied to or taken from an electric circuit for one hour.

Landfill Gas

Methane gas from landfills, created when organic waste decomposes, is recovered and burned for heat and energy production. Burning methane converts it from a highly potent GHG (methane has 22 times the GHG impact of CO2) to CO2, which is much less potent.

Levelized Cost

The constant stream of values that produces the same present value as the non-constant stream of values, using the same discount rate. In this report, levelized cost is used to refer to the cost for the NWPCC's 20-year wholesale electric market price forecasts. For the electric market price forecast, the cost is expressed in dollars per MWh. Costs are levelized in real dollars. For example, the amount borrowed from a bank is the present value of buying a house; the mortgage payment including interest on a house is the levelized cost of that house.

Load

The amount of electric power delivered or required at any specified point or points on a system. Load originates primarily at the power-consuming equipment of the customer.

The amount of kilowatt-hours of electricity delivered in the most recently completed year by a qualifying utility to its Washington retail customers (from RCW 19.285: The Energy Independence Act).

Load Forecasting

The procedures used to estimate future consumption of electricity. Load forecasts are developed either to provide the most likely estimate of future load or to determine what load would be under a set of specific conditions (e.g., extremely cold weather or changing demographics).

Load/Resource Balance

A comparative evaluation of future load forecasts in relation to the availability of demand-side and supply-side resources available to meet those future load needs.

Loss of Load Probability (LOLP)

A measure of the probability that a system load demand will exceed capacity during a given period; often expressed as the estimated number of days over a longer period.

Megawatt (MW) and Megawatt-Hour (MWh)

One thousand kilowatts, or 1 million watts; the standard measure of electric power plant generating capacity. A megawatt-hour (MWh) is a measure of electric energy equal to one megawatt of power supplied to or taken from an electric circuit for one hour.

Nominal Dollars

Dollars that are paid for a product or service at the time of the transaction. Nominal dollars are those that have not been adjusted to remove the effect of changes in the purchasing power of the dollar (inflation); they reflect buying power in the year in which the transaction occurred.

Northwest Power and Conservation Council (NWPCC)

See Power Plan (Fifth, Sixth, etc.)

Overgeneration Event

A requirement of RCW 19.280.020: "means an event within an operating period of a balancing authority when the electricity supply, including generation from intermittent renewable resources, exceeds the demand for electricity for that utility's energy delivery obligations and when there is a negatively priced regional market."

Peak Demand (Load)

The maximum demand imposed on a power system or system component during a specified time period.

Peak(ing) Resource

Power generated by a utility system component that operates at a very low capacity factor; generally used to meet short-lived and variable high demand periods.

Plug-In Hybrid Electric Vehicle

A vehicle that shares the characteristics of both a conventional hybrid electric vehicle, having an electric motor and an internal combustion engine, and of a battery electric vehicle (BEV), which uses batteries as its only source of energy to move the vehicle. The combustion engine in a PHEV works as a backup when the batteries are depleted.

Portfolio

A set of supply-side and demand-side resources currently or potentially available to a utility.

Power Plan (Fifth, Sixth, etc.)

A 20-year electric power plan that guarantees adequate and reliable energy at the lowest economic and environmental cost to the Northwest. A new plan is developed every five years as a result of the Northwest Power Act of 1980 that authorized the formation of the Northwest Power and Conservation Council (NWPCC or the Council.) The Sixth Power Plan, the most recent, was adopted in February 2010. The NWPCC is also mandated to develop a fish and wildlife program to protect and rebuild populations affected by hydropower development in the Columbia River Basin and conduct an extensive program to educate and involve the public in the their decision-making processes.

Probability

The likelihood or chance that something will happen.

Progress Report

A requirement of RCW 19.280.030: Electric utility resource plans, which reads "At a minimum, progress reports reflecting changing conditions and the progress of the integrated resource plan must be produced every two years…"

Real Dollars

Dollars that have been adjusted to remove the effects of inflation. Real dollars are sometimes called uninflated dollars, today's dollars or constant dollars.

Regression Analysis

A technique used for the modeling and analysis of numerical data consisting of values of a dependent variable (response variable) and of one or more independent variables (explanatory variables).

Renewable Energy Credit (REC)

A tradable certificate of proof of at least one megawatt-hour of an eligible renewable resource where the generation facility is not powered by fresh water, the certificate includes all of the nonpower attributes associated with that one megawatt-hour of electricity, and the certificate is verified by a renewable energy credit tracking system selected by the department (from RCW 19.285: The Energy Independence Act).

Renewable Portfolio Standard (RPS)

A regulation that an electric power provider generate or purchase a specified percentage of the power it supplies/sells from renewable energy resources. Washington State's RPS is codified in RCW 19.285: The Energy Independence Act.

Renewable Resource

A resource whose energy source is not permanently used up in generating electricity.

Electricity generation facilities fueled by: (a) Water; (b) wind; (c) solar energy; (d) geothermal energy; (e) landfill gas; (f) biomass energy utilizing animal waste, solid organic fuels from wood, forest, or field residues or dedicated energy crops that do not include wood pieces that have been treated with chemical preservatives such as creosote, pentachlorophenol, or copper-chrome-arsenic; (g) byproducts of pulping or wood manufacturing processes, including but not limited to bark, wood chips, sawdust, and lignin in spent pulping liquors; (h) ocean thermal, wave, or tidal power; or (i) gas from sewage treatment facilities (from RCW 19.280: Electric Utility Resource Plans).

Means: (a) Water; (b) wind; (c) solar energy; (d) geothermal energy; (e) landfill gas; (f) wave, ocean, or tidal power; (g) gas from sewage treatment facilities; (h) biodiesel fuel as defined in RCW 82.29A.135 that is not derived from crops raised on land cleared from old growth or first-growth forests where the clearing occurred after December 7, 2006; and (i) biomass energy based on animal waste or solid organic fuels from wood, forest, or field residues, or dedicated energy crops that do not include (i) wood pieces that have been treated with chemical preservatives such as creosote, pentachlorophenol, or copper-chrome-arsenic; (ii) black liquor byproduct from paper production; (iii) wood from old growth forests; or (iv) municipal solid waste (from RCW 19.285: The Energy Independence Act).

Resource Adequacy

A measure defining when a utility has sufficient resources to meet customer needs under a range of conditions that affect supply and demand for electricity.

Resource Mix

The different types of resources that contribute to a utility's ability to generate power to meet its loads.

Scenario

A possible course of future events. In the report, scenarios are used to compare the District's existing portfolio of generating resources under a range of possible future conditions including: various load forecasts and various hydro production cost forecasts.

Seventh Power Plan

See Power Plan (Fifth, Sixth, Seventh, etc.)

Shape

Refers to the nature of power generation capability and loads to change in quantity over time; changing from day to day and month to month.

Sixth Power Plan

See Power Plan (Fifth, Sixth, etc.)

Slice Power Sales

A power sales contract for a specific percentage share of a generation project's capacity and energy for a specific period of time at a fixed price (i.e., there is no guarantee of the amount of energy that will result from the contract for resources such as hydro and wind where the fuel is driven by nature).

Solar Resource

The generation of electricity from sunlight. This can be direct as with photovoltaics, or indirect as with concentrating solar power, where the sun's energy is focused to boil water which in then used to provide power.

Substitute Resource

Reasonably available electricity or generating facilities, of the same contract length or facility life as the eligible renewable resource the utility invested in to comply with chapter 19.285 RCW requirements, that otherwise would have been used to serve a utility's retail load in the absence of chapter 19.285 RCW requirements to serve that retail load with eligible renewable resources (from WAC 194-37: Energy Independence).

Supply-Side Resources

Those power resources that come from a power generating plant or facility.

Surplus Energy

Energy that is not needed to meet a utility's load or contractual commitments to supply firm or non-firm power.

Transmission System

Often referred to as the "grid", it is the system of electrical lines that allows the bulk delivery of electricity to consumers typically between a power plant and a substation near a populated area. Due to the large amount of power involved, transmission normally takes place at high voltage (110 KV or above) and because of the long distances often involved, overhead transmission lines are usually used.

Waste-to-Energy Resource

Incineration process in which solid waste is converted into thermal energy to generate steam that drives turbines for electricity generators.

Wastewater-Treatment Gas Resource

Methane gas, given off in the digestion of sewage, is recovered and burned for heat and energy production. Sewage gas consists of approximately 66% methane and 34% CO2. Burning methane converts it from a highly potent GHG (methane has 22 times the GHG impact of CO2) to CO2, which is much less potent.

Weather-Normalized Load

Actual energy load data that has been mathematically adjusted to represent an energy load that would have occurred in an average weather year.

Wind Resource

Energy generated when wind turns the blades of a wind turbine which drive a generator. The longer the blades and the faster the wind speed (up to a point), the more electricity that is generated.