CITY OF CENTRALIA

2024 ELECTRIC UTILITY RESOURCE PLAN UPDATE

Required by: RCW 19.280.030

Prepared by:

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EXECUTIVE SUMMARY

The City of Centralia's (City) energy future is essential to its economic health. The City has long benefited from having access to low-cost electricity from the Bonneville Power Administration (BPA) system; as well as, low-cost energy from its Yelm hydroelectric generation plant (Yelm). However, as the world and the energy industry change, the City faces a challenge to its economy in the form of rising electricity costs. This document is intended as a roadmap to assist the City in meeting its future energy requirements over the next ten years. Planned resources include a mix of BPA resources, City resources, Renewable resources, and Conservation resources.

This resource plan is written to satisfy the requirements set forth in Washington State law RCW 19.29A, 19.280, and 19.405. In 2023, 94 percent of the City's power resources were non-carbon producing. The City will continue its efforts to bring the remaining 6 percent of carbon-sourced power to zero by 2030.

Centralia City Light (Utility) will continue to purchase clean carbon-free hydroelectric power from BPA and to produce clean hydroelectric power from its Yelm Hydroelectric plant. The Utility will continue to offer conservation-related programs that promote the efficient use of energy. The Utility has expanded its commitment to support the deployment of solar-related net metered services by increasing the upper limits of allowable net-metered installations to 2.341 MW. The Utility will purchase additional power from BPA to meet its above Rate period High Water Mark power requirements.

While this Plan is not a legally binding document, it provides a description of current power loads and resources, as well as the forecasted power loads and resources for the 2029 and 2034 time periods as required by RCW 19.280.030. The Plan is available to the public[1] and will next be updated in 2026.

The City has less than 25,000 customers and is exempt from meeting the mandatory conservation and renewable portfolio standards required for larger utilities (I-937). However, this 2024 Plan still places emphasis on energy efficiency and conservation opportunities.

[1] 2022 Resource Plan is available on the City's website: https://www.cityofcentralia.com/236/Electric-Utility-Resource-Plan

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1. DEFINITIONS

aMW: means average megawatts for one year.

ARHWM: means Above Rate period High Water Mark which is the power required by the Utility to meet its TRL obligations less the RHWM allocation by BPA and less any existing resources that the Utility might have. The ARHWM value only includes whole MW increments of this calculation. Under the regional dialog contract with BPA the Utility is obligated to purchase additional power (either federal or non-federal) to cover its ARHWM obligations.

BPA: means the Bonneville Power Administration, a federal agency.

City: means the City of Centralia.

CETA: means the Clean Energy Transformation Act which was codified (Senate Bill 5116) on May 7, 2019. This law seeks to eliminate all carbon-sourced generation from electricity by January 1, 2045 and prohibits electricity generation from coal based resources from being used within the State of Washington after 2025.

CMC: means Centralia Municipal Code.

Commission: means the Washington Utilities and Transportation Commission. The Commission does not establish, approve, or set rates for publically-owned utilities.

Conservation: means any reduction in electric power consumption that results from increases in the efficiency of energy use, production, transmission, or distribution.

Contract: means the 20-year Power Sales Agreement #09PB-13016 with BPA starting in 2008 and ending in 2028.

Council: means the Centralia City Council. It is the governing body of Centralia City Light with the authority to set and approve rates.

Demand Response: means changes in electric usage by demand-side resources 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 response" may include measures to increase or decrease electricity usage on the customer's side of the meter in response to incentive payments.

Department: means the Washington State Department of Commerce

Distributed Energy Resource: means a Non-emitting electric generation or Renewable Resource or program that reduces electric demand, manages the level or timing of electricity consumption, or provides storage, electric energy, capacity, or ancillary services to an Electric Utility and that is located on the distribution system, any subsystem of the distribution system, or behind the customer meter, including conservation and energy efficiency.

Electric Utility or **Utility**: means Centralia City Light electric utility.

Energy Transformation Project: means a project or program that: provides energy-related goods or services, other than the generation of electricity; results in a reduction of fossil fuel consumption and in a reduction of the emission of greenhouse gases attributable to that consumption; and provides benefits to the customers of an Electric Utility.

FERC: means the Federal Energy Regulatory Commission which is the licensing agency for the Utility's Yelm Hydroelectric Plant.

Fossil Fuel: means natural gas, petroleum, coal, or any form of solid, liquid, or gaseous fuel derived from such a material.

Fuel Mix: Identifies the source of fuel used by an Electric Utility to provide electric service to its customers during the previous calendar year using the following standardized categories: (a) Coal; (b) Hydroelectric; (c) Natural gas; (d) Nuclear; (e) Petroleum; (f) Solar; (g) Wind; (h) Other generation; (i) Unspecified sources.

Greenhouse Gas (GHG): includes carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and any other gas or gases designated by the department of ecology by rule under RCW 70.235.010.

Megawatt (MW): is a unit of electric capacity or electric load. A MW is equal to 1,000 kilowatts (kW). Watts are a measurement of power, describing the rate at which electricity is being used at a specific moment.

Megawatt Hour (MWh): is a unit of measure of electric energy. A MWh is 1,000 kilowatt-hours (kWh). A MWh is the amount of electricity generated by a one megawatt (MW) electric generator operating or producing electricity for one hour.

Natural Gas: means naturally occurring mixtures of hydrocarbon gases and vapors consisting principally of methane, whether in gaseous or liquid form, including methane clathrate. Does not include renewable natural gas or the portion of renewable natural gas when blended into other fuels.

NEMS: means the Northwest Energy Management Services which is a trade organization set up to purchase non-federal power for its members.

NIES: means the Northwest Intergovernmental Energy Supply which is a part of NEMS that is set up to purchase non-federal power for intergovernmental agencies such as municipalities and public utility districts.

Non-emitting Electric Generation: means electricity from a generating facility or a resource that provides electric energy, capacity, or ancillary services to an Electric Utility and that does not emit GHG as a by-product of energy generation. This does not include renewable resources or nuclear power generation.

NRU: means Northwest Requirements Utilities

P28 Contract: means the yet to be developed and approved Post 2028 20-year Power Sales Agreement with BPA covering the time frame between 2028 and 2048.

RHWM: means Rate period High Water Mark which is set by BPA and establishes the amount of Tier 1 power the Utility may receive from BPA during the given rate period which occurs in two-year increments.

RCW: means the Revised Code of Washington

Renewable Energy Certificate or Credit (REC): means a tradable certificate of proof of one megawatt-hour of power generated by a Renewable Resource. The certificate includes all of the non-power 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.

Renewable Resources: means 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 or liquid 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) by-products 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.

Resource Plan: means an assessment that estimates electricity loads and resources over a defined period of time and complies with the requirements in RCW 19.280.030(2).

Total Retail Load (TRL): means the amount of megawatt-hours of electricity delivered in a given calendar year by an electric utility to its retail electric customers.

TRM: means Tiered Rate Methodology used in the regional dialog contract with BPA.

Unspecified Source: means an electricity source for which the fuel attribute is unknown or has been separated from the energy. This electricity is obtained in a transaction where the seller does not identify a specific generating source, typically through short-term transactions in the bulk power markets.

YELM: means the City's Yelm hydroelectric generation facility located in Yelm, Washington.

2. INTRODUCTION

Located in southwest Washington, the town of Centralia was founded by George Washington, an African American who came west in 1850 to escape discrimination. Washington first settled in Oregon Territory, but was barred from owning land there, so he moved north and eventually obtained a land claim at the junction of the Skookumchuck and Chehalis rivers. When the Northern Pacific Railroad built a line through the area in 1872, Washington recognized the opportunity to start a town. In early 1875, Washington and his wife Mary Jane formally platted the town of Centerville, later to be renamed Centralia.

In 1893, the Centralia City Council authorized formation of Centralia City Light for $13,000. In 1895, citizens of Centralia approved the formation of Centralia City Light through a public vote with 259 people for and 98 people against.

In 1929, the City passed Ordinance #658 to purchase, acquire, and construct the Yelm Hydroelectric generation plant, canal, diversion dam, and transmission line for a total of $955,000. Of this, the City authorized a $650,000 revenue bond and provided the remaining $305,000 from its existing funds to complete the project.

Today, the city owns and operates a complete electrical system consisting of a hydroelectric generating plant, transmission system, substations, and distribution system serving the City and surrounding area. The intent of this Resource Plan is to identify the resources required to meet the City's electricity needs in both the short term (five years) and the long term (ten years).

3. LEGISLATIVE MANDATE

The Utility is required by the State of Washington under RCW 19.280.030 to develop an Electric Utility Resource Plan (Plan) that must be submitted to the Department by September 1, 2024. This statute specifies the requirements for utilities that need to develop a fully integrated resource plan (utilities with 25,000 or more customers) or simply a resource plan (utilities with fewer than 25,000

customers). The City of Centralia currently serves fewer than 25,000 customers and submits this document per the requirements set forth within the RCW for an electric resource plan.

The Council encourages participation of its consumers in development and approval of the Plan. The Plan will be made available on the City of Centralia's website prior to a public hearing to be held in August 2024. Results of the public hearing will be included in Appendix D.

3.1. RCW 19.280.030

An electric utility that is required to develop a resource plan under RCW 19.280.030 was required to complete its initial plan by September 1, 2008 and update the plan on a regular basis at a minimum interval of every two years. In 2008, 2010, 2012, 2014, 2016, 2018, and 2020 the Utility submitted plans to meet the requirements of RCW 19.280.030. This report is an update of the 2020 Plan.

The intent of RCW 19.280.030 is to encourage the development of new safe, clean, and reliable energy resources to meet demand in Washington for affordable and reliable electricity. This legislation requires utilities to 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 and long terms. Information obtained from these plans will be used to assist in identifying and developing new energy generation, conservation and efficiency resources, methods and commercially available technologies and facilities for integrating renewable resources, and related infrastructure to meet the state's electricity needs.

This Plan:

a) Estimates loads for the next five and ten years; and

b) Enumerates the resources that will be maintained and/or required to serve those loads; and

c) Explains why the resources in (b) of this subsection were chosen and, if the resources chosen are not:

   (i) Renewable resources;

   (ii) Methods, commercially available technologies, or facilities for integrating renewable resources, including addressing any over-generation event; or

   (iii) Conservation and efficiency resources, why such a decision was made.

d) By December 31, 2020, and in every subsequent resource plan, identify how the utility plans over a ten-year period to implement RCW 19.405.040 and 19.405.050.

3.2. RCW 19.405.040

This is an abbreviated description of the requirements set forth in the RCW. This RCW requires that all retail sales of electricity to Washington Retail electric customers be GHG neutral between

January 1, 2030 and December 31, 2044. An Electric Utility must demonstrate its compliance using a combination of Non-emitting Electric Generation and electricity from Renewable Resources, or alternate compliance options. To achieve compliance with this standard an Electric Utility must:

a) For the four-year compliance period beginning January 1, 2030, and for each multiyear compliance period thereafter through December 31, 2044, must demonstrate its compliance with this standard using a combination of Non-emitting Electric Generation and electricity from Renewable Resources, or alternative compliance options, as provided in this section.

    (i) Pursue all cost-effective, reliable, and feasible Conservation and efficiency resources to reduce or manage TRL, using the methodology established in RCW 285.040, if applicable; and

    (ii) Use electricity from Renewable Resources and Non-emitting Electric Generation in an amount equal to one hundred percent of the Utility's TRL over each multiyear compliance period.

b) Through December 31, 2044, an Electric Utility may satisfy up to twenty percent of its compliance obligation under (a) of this subsection with an alternative compliance option.

c) Electricity from Renewable Resources used to meet the standard under (a) of this subsection must be verified.

d) Hydroelectric generation used by an Electric Utility in meeting the standard under (a) of this subsection may not include new diversions, new impoundments, new bypass reaches, or expansion of existing reservoirs constructed after May 7, 2019.

3.3. RCW 19.405.050

There are eight elements to this legislation.

1) It is the policy of the state that Non-emitting Electric Generation and electricity from Renewable Resources supply one hundred percent of all sales of electricity to Washington retail electric customers by January 1, 2045.

2) Each Electric Utility must incorporate subsection (1) of this section into all relevant planning and resource acquisition practices including, but not limited to: Resource planning under chapter 19.280 RCW; the construction or acquisition of property, including electric generating facilities.

3) In planning to meet projected demand consistent with the requirements of subsection (2) of this section and RCW 19.285.040, if applicable, an electric utility must pursue all cost-effective, reliable, and feasible Conservation and efficiency resources, and Demand Response. In making new investments, an Electric Utility must, to the maximum extent feasible:

    a. Achieve targets at the lowest reasonable cost, considering risk;

b. Consider acquisition of existing Renewable Resources; and

c. In the acquisition of new resources constructed after May 7, 2019, rely on Renewable Resources and energy storage, insofar as doing so is consistent with (a) of this subsection.

4) The Commission, Department, Energy Facility Site Evaluation Council, Department of Ecology, and all other state agencies must incorporate this section into all relevant planning and utilize all programs authorized by statute to achieve subsection (1) of this section.

5) Hydroelectric generation used by an Electric Utility to satisfy the requirements of this section may not include new diversions, new impoundments, new bypass reaches, or expansion of existing reservoirs constructed after May 7, 2019.

6) Nothing in this section prohibits an Electric Utility from purchasing or exchanging power from the Bonneville Power Administration.

7) Affected market customers must comply with the obligations of this section.

8) Any market customer that purchases electricity exclusively from carbon-free resources and eligible Renewable Resources, as defined in RCW 19.285.030 as of January 1, 2019, pursuant to a special contract with an investor-owned utility approved, prior to May 7, 2019, by order of the commission is subject to the requirements of such an order and not to the standards established in this section.

4. HISTORIC LOADS

4.1. Background

The Utility owns and operates an electric system that serves customers within the City, Centralia's Urban Growth Area, and areas surrounding the City. The Utility currently serves approximately 10,886 residential and general service electric consumers. Electric Utility customers fall into the following six service classes:

- Residential
- Small General Service (less than 50kW demand)
- Medium General Service (50kW to 200kW demand)
- Large General Service (200kW to 1,000kW demand)
- Extra Large General Service (greater than 1,000kW demand)
- Public Street Lighting

4.2. Base Year Loads

The five previous reports utilized 2013, 2015, 2017, 2019, and 2021 as their respective base years. This report will use 2023 as its base year. The base year begins on January 1st and ends on December 31st. Table 2 illustrates the base year loads for the City. These loads are broken out by service class, total energy consumption, and annual peak demand.

Table 1 - Base Year Loads

	Base Load					
Load Category	2013	2015	2017	2019	2021	2023
Service Class (aMW)						
Residential	13.44	12.14	13.90	13.34	13.98	14.27
Small General Service (<50kW)	3.91	3.71	3.90	3.73	3.78	3.78
Medium General Service (50kW - 200kW)	2.99	2.94	2.98	2.84	2.79	2.71
Large General Service (200kW - 1,000kW)	3.28	3.14	3.30	3.24	4.24	4.19
Extra Large General Service (>1,000kW)	5.96	5.92	6.24	6.28	5.60	5.29
Street Lighting	0.13	0.13	0.05	0.05	0.05	0.05
Losses/Utility Usage	1.06	1.66	1.43	1.30	1.13	1.00
Total Retail Loads (aMW)	30.77	29.64	31.81	30.78	31.574	31.289
Total Energy Consumption (MWh)	260,342	245,099	266,120	258,189	266,701	265,359
Peak Demand (MW)	64.32	61.02	67.85	63.09	62.68	62.30

4.3. Service Class Loads

Total loads for the base year can be broken down by service class. The pie chart in Figure 1 shows the distribution of electricity by service class for the base year. In the base year, residential customers consumed 47.10% of the total retail load while general service customers (small, medium, large, and extra-large) consumed 52.73% and street lighting consumed 0.16%.

Figure 1 - 2023 Base Year by Customer Class

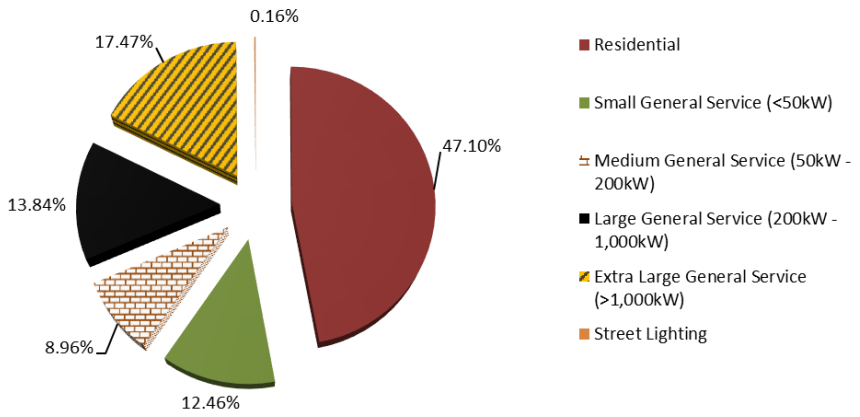
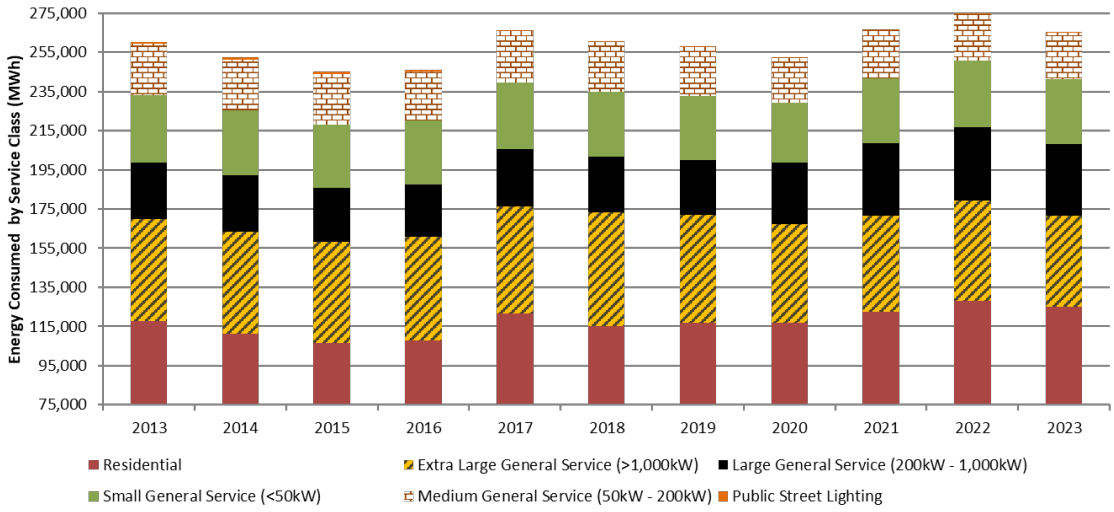


Figure 2 illustrates historic energy sales distributed by service classes between 2013 and 2023. The dominant retail loading for the Utility comes from its residential service class followed by extra-large general service loading.

Figure 2 - Historic Energy Consumption by Customer Class



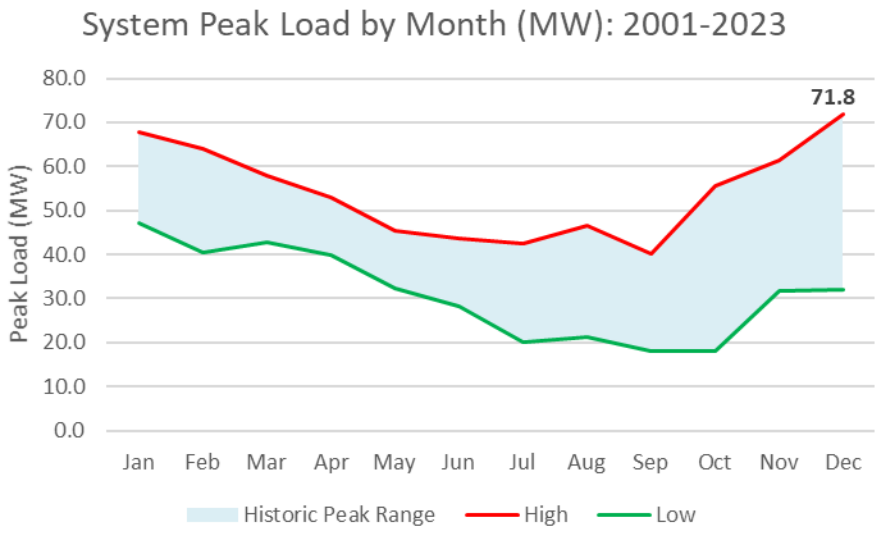
4.4. Peak Loads

Figure 3 provides a range of historic system peak loads for each month of the year between 2001 and 2023. The City's historic system peak of 71.8 MW occurred on December 9, 2009. The range of peak loading is greatest during the fall and winter months. This further supports the notion that the City's induction heat loading from residential customers is weather dependent. On very cold winter years the peak will rise and during mild years it approaches the total system average TRL. Loading during spring and summer follows a fairly narrow band between high and low system

loading. During summer months the system peaks are most likely developed by the use of air conditioning during warmer summers.

The availability of power during winter peak loading conditions is of great concern to the Utility. This is promulgated by the closure of carbon sourced base load generation plants and the State of Washington's ban on importing power that is generated with carbon based resources. With the increased emphasis on variable generation resources (i.e. solar and wind resources) it may become difficult to meet the Utility's peak loading requirements during critical loading conditions. Since the Utility's system peak loads occur during winter months, it must ensure the resources are available to support peak loads. The variability of renewable resources, especially during the cold winter months gives pause to the possibility that these resources will be dependably available when the Utility's customers are the most vulnerable. The Utility's peak loads are totally driven by weather.

Figure 3 - System Peak Loading



5. FORECASTED LOADS

This plan is based on typical customer growth rates, trends in customer energy use, and collaboration with BPA forecast planners. BPA's 2022 TRL forecast was used to update the Utility's load forecast for the next five (5) and ten (10) years (2029 and 2034 respectively). BPA forecasted that the Utility's load would see minimal fluctuation from 33.385 aMW in 2024 to 33.773 aMW in 2029 and 34.177 aMW in 2034 as illustrated in Table 3. All loads are estimated assuming the Utility continues to implement reductions from conservation and/or demand response programs. This forecast is based on an inclining growth rate between 2024 and 2034 where the average annual growth rate is projected at 0.234%.

The Utility estimates a majority of its TRL will continue to come from residential sales. The Utility expects that all other service class retail loads will continue to lag behind expected residential loads. This of course excludes any extra-large general service loads that may develop (exceeding one aMW) during this time frame. At this point in time, the Utility cannot accurately estimate additional extra-large general service (exceeding one aMW) loads. The Utility has established criteria in its rate ordinances[2] that require any new extra-large general service loads to enter into an Electric Service Agreement (ESA) with the City to reduce power purchasing risks associated with the purchase of ARHWM resources to meet loads generated by new extra-large general service customers (Appendix A).

Table 2 - TRL Load Forecast

Year	BPA Load Forecast TRL* (aMW)
2024	33.385
2025	33.455
2026	33.535
2027	33.614
2028	33.704
2029	33.773
2030	33.853
2031	33.932
2032	34.012
2033	34.094
2034	34.177

** This represents the projected Total Retail Load*

6. EXISTING RESOURCES

The Utility receives federal power from the Bonneville Power Administration (BPA) and power from its own Hydroelectric Generation plant in Yelm. BPA has two pricing tiers to capture the difference in costs associated with existing BPA resources (Tier 1) and new resources (load growth) or market based purchases (Tier 2) which may be required to meet a utility's load growth power supply needs that exceed the current capability of the BPA system.

Table 4 provides a breakdown of resources for the base year. In 2023, the Utility had 31.358 aMW of total resources available to serve its TRL. Figure 5 provides a percentage breakdown showing the

[2] CMC 13.04.045 Extra Large General Service Rate

source of these resources. BPA Tier 1 and Tier 2 resources provide 85 percent of the available resource to the Utility. Non-federal resources contributed 13 percent. The Utilities Yelm Hydroelectric plant provides 9.3 percent. The remaining comes from Conservation and Renewables.

Figure 4 illustrates resources by the type of resource between 2013 and 2023. Non-federal resources were increased in 2022 and 2023 while the Yelm Hydroelectric plant's operation was restricted by FERC. FERC instituted streamflow license restrictions in 2020 to reduce the potential risk of a canal failure between the head works and the hydroelectric facility (9.1 miles). The Utility has been actively pursuing mitigation options to reduce or eliminate these risks and expects to see these restrictions reduced and/or eliminated in 2024/25.

Table 3 - Base Year Resources

	Base Year					
Resource Category (aMW)	**2013**	**2015**	**2017**	**2019**	**2021**	**2023**
Yelm Hydroelectric Project	7.907	7.652	9.486	7.134	3.512	2.921
BPA Priority Firm (Tier 1)	23.035	20.659	21.663	22.233	23.432	26.485
Above High Water Mark (Tier 2)	0.732	0.227	0.111	0.180	0.349	0.282
Non-Federal	0.000	0.810	0.252	1.009	4.243	1.500
Conservation	0.197	0.106	0.217	0.109	0.358	0.062
Renewables	0.000	0.007	0.016	0.039	0.054	0.109
Total Resources	**31.871**	**29.460**	**31.746**	**30.704**	**31.949**	**31.358**

Figure 4 - Energy Resources

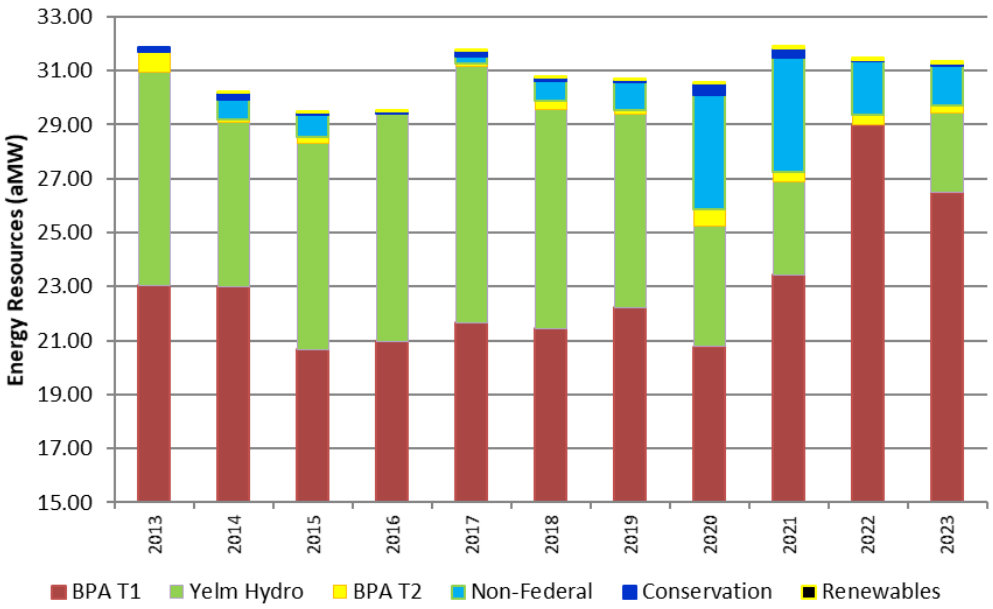
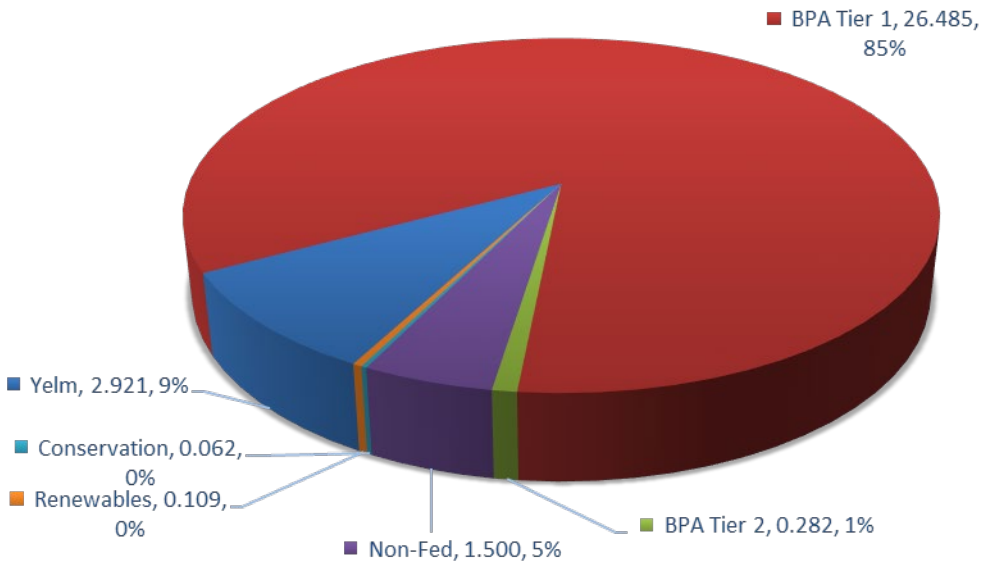


Figure 5 - Base Year Resource Pie Chart

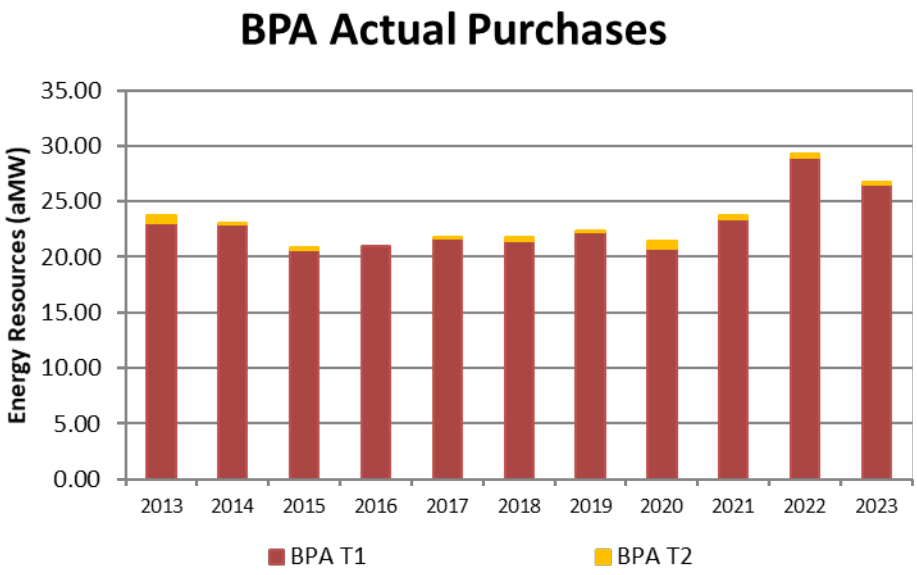


6.1. Bonneville Power Administration

The Utility has been a full requirements customer of BPA since 1941. The Utility signed the 20-year Power Sales Agreement #09PB-13016 (Contract) with BPA that started in 2008 and terminates in 2028. The Contract is based on BPA's Tiered Rate Methodology (TRM). The Utility will continue to be a full service customer of BPA for its Tier 1 energy requirements in excess of the Yelm Hydroelectric Facility (YELM) until 2028. The Utility intends to enter into a Post-28 (P28) Contract with BPA when it is ready in 2025.

The Base Year 2023 electricity resources supplied by BPA were Priority Firm (PF) purchases (Tier 1) totaling 26.485 aMW. The Utility also received BPA's Load Shaping resources in the amount of 0.282 aMW. Figure 6 illustrates the amount of Tier 1 and Tier 2 power supplied to the Utility between 2013 and 2023.

Figure 6 - BPA Historical Resources



6.2. Yelm Hydroelectric Plant

The Utility owns and operates a hydroelectric facility on the Nisqually River in Yelm, Washington. The facility diverts water through a man-made canal from the Nisqually River approximately nine miles upstream of the powerhouse. This facility is connected to the City of Centralia via a 26.1-mile 69KV transmission line that traverses through Thurston County to the Utility's May Street Substation. All power produced by Yelm must be used by the Utility and cannot be sold to third parties. The Yelm Hydroelectric Project was originally built in 1929 and is licensed[3], with a

[3] FERC License #10703 in 1997

maximum rated capacity of 12 MW, through 2037. The project operated during the Base Year providing around 2.921 aMW to the distribution system.

Figure 7 shows historical generation amounts for Yelm between 2013 and 2023. The BPA load following power purchase contract specifies that the Utility must produce 7.114 aMW each year and 7.109 aMW during leap years. When the Utility does not meet this requirement it must purchase additional power from BPA to meet system load requirements. The amount of power generated is dependent on the amount of water available in the Nisqually River.

During the past twenty-five years, the YELM plant has generated varying amounts of power as indicated in Figure 8. Actual production of the plant depends greatly on several operational factors: having enough water in the Nisqually River; dependability of generation equipment; capacity of the nine-mile canal to deliver water; reliability of the canal; FERC license restrictions, and reliability of the 26.1-mile transmission line that delivers the power produced in YELM to Centralia. YELM's production curve varies from year to year as illustrated in Figure 8. Between 1995 and 2023 YELM generated a high average of 9.02 aMW during the peak month of February and low average of 4.82 aMW during the month of August. The Utility has experienced occasions where a single operational factor shut down power production at YELM. Power production at YELM is dependent on having all of the operational factors listed above available. For planning purposes, the Utility assumes generation at the levels specified within the BPA contract (7.114 aMW and 7.109 aMW during leap years). Since 2020, the Utility has been unable to generate levels specified in the BPA contract due to FERC restrictions on how much water the Utility can accommodate in the 9.1 mile canal.

Figure 7 – Historical Yelm Hydroelectric Generation

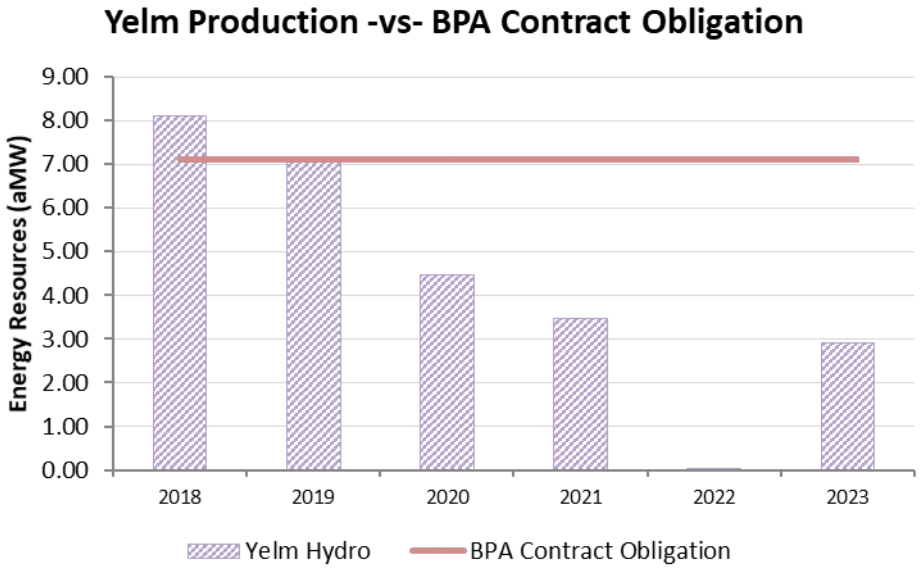
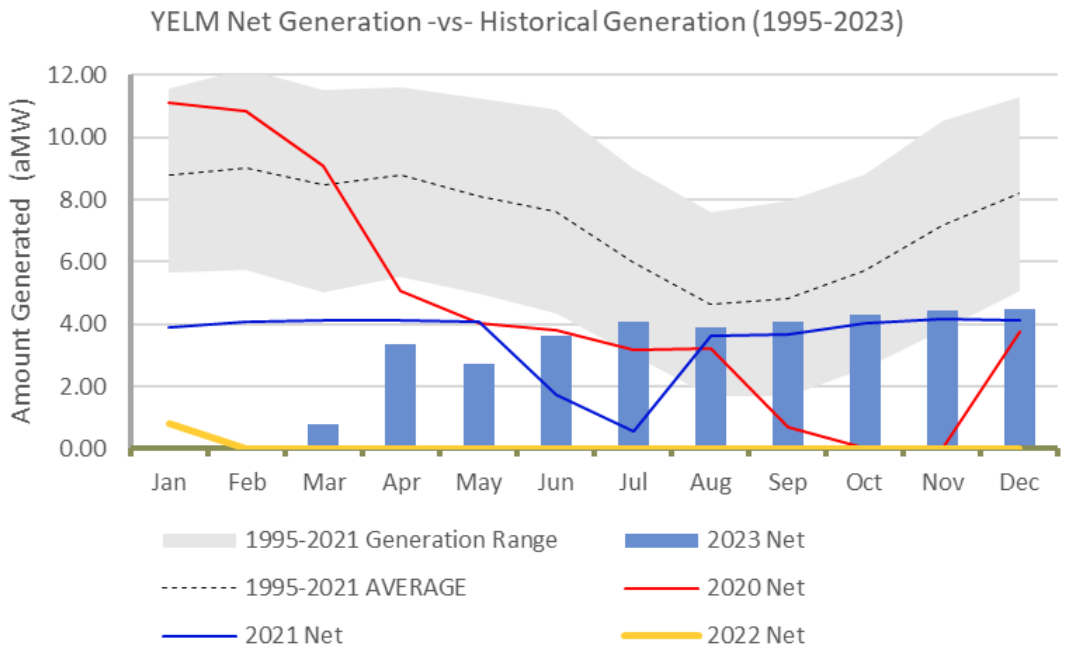


Figure 9 shows how net generation at YELM between 2020 and 2023 compares to the expected range of net generation between January and December. The expected range of generation is based on historical data between 1995 and 2023. In March 2020, FERC issued an order restricting flows in the 9.1 mile diversion canal to 300 cubic feet per second (cfs). This canal provides all of the water needed to generate power and under normal operations the Utility can utilize up to 800 cfs. The FERC order requires the utility to make improvements to the diversion canal to reduce the risk of a potential canal failure that could result in flooding and damage to private property. Because of this, net generation has fallen significantly in 2020, 2021, 2022, and 2023. Generation was restarted in 2023 with approximately 300 cfs of water available in the canal. This produced roughly 3.0 aMW in 2023. The Utility is actively pursuing the improvements requested by FERC.

Figure 8 - Yelm Production between 1995 and 2023

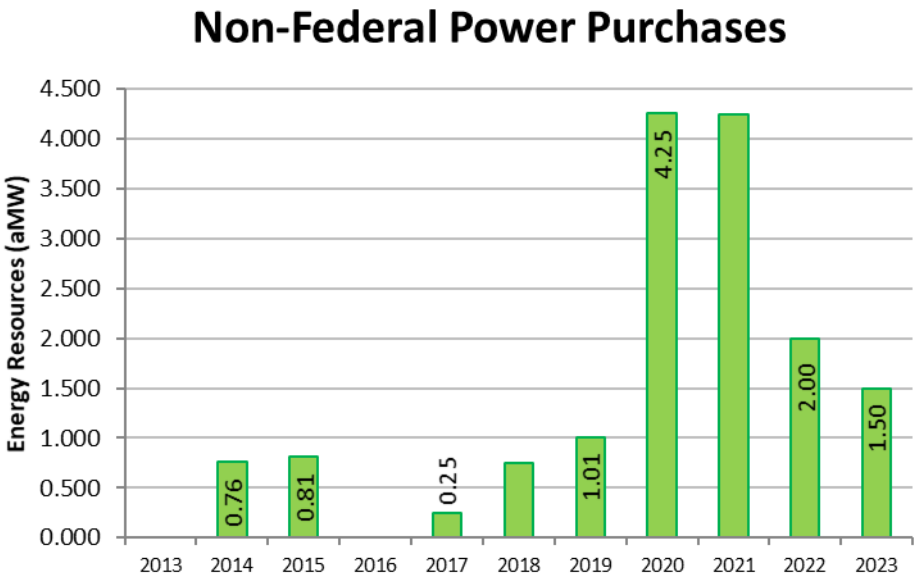


6.3. Above Rate Period High Water Mark Power

In October of 2011, BPA implemented the TRM where the traditionally low rates for power are only available for the first block of power. This first block is referred to as Tier 1, set by the Contract High Water Mark (CHWM) for each utility, and was defined by the Utility's actual 2010 loads. Within the TRM, the actual availability of Tier 1 power is adjusted every two years based on the Federal Columbia River Power System (FCRPS) and the City's Tier 1 Cost Allocator (TOCA). The TOCA and FCRPS resources are used to define the City's Rate Period High Water Mark (RHWM).

BPA established RHWM in December 2023[4] for the 2024/25 rate period equal to 24.371 aMW. The BPA contract requires that the City acquire additional resources for the amount of power required to meet the TRL. The ARHWM power equates to TRL less RHWM less existing resources. In the Base Year the City purchased 1.5 aMW of Non-Federal resources. Figure 10 provides details regarding Non-Federal purchases between 2013 and 2023.

Figure 9 - Non-Federal Power Purchases



6.4. Conservation

The City has a long history of participation in energy efficiency programs. The City has taken advantage of Conservation credits from BPA and self-funding to maintain its Conservation programs. Programs include lighting, ductless heat pumps, heat pump water heaters, track and tune, and appliance rebates. A majority of annual expenditures come from commercial and industrial lighting projects. BPA has an Energy Smart Industrial program that seeks to find energy saving measures for industrial customers.

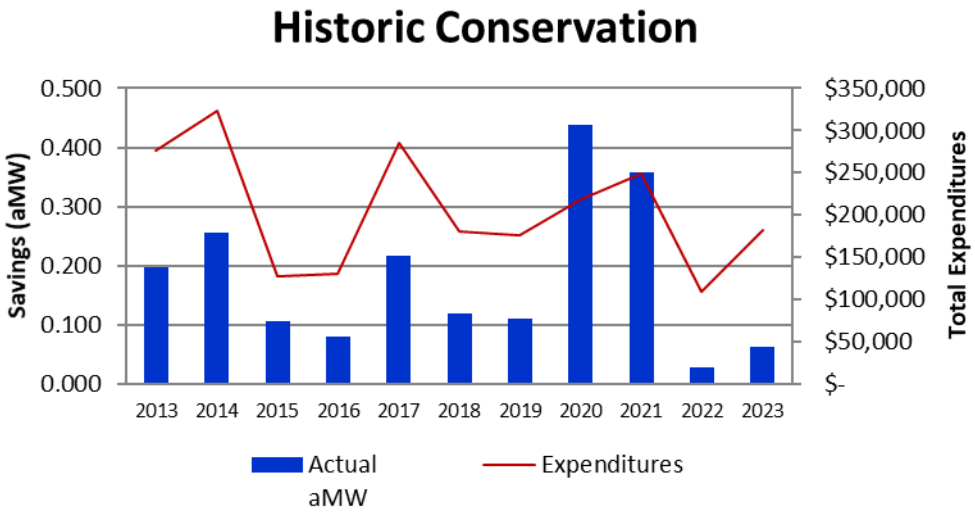
For industrial customers, the highest achievable savings are in energy management. The City has supported a track and tune project with the help of Energy Smart Industrial during the 2015-2018 timeframe. BPA has provided the City with engineering support to assist commercial customers with custom projects. The greatest achievable savings are found in lighting and HVAC for commercial customers. That is where the City has focused its funding.

[4] BPA 2024/25 Rate Case proceedings were being worked in 2022 and will be finalized in 2022.

Residential achievable savings are the highest for HVAC and water heating. The City continues to realize energy savings due to HVAC system upgrades. In the last few years, most residential conservation savings were attributed to the ductless heat pump program.

Figure 11 illustrates the conservation efforts that the City has achieved between 2013 and 2023. Total accumulated conservation between 2007 and 2023 was 2.772 aMW. The total cost for this investment was $3,443,010. The historical average cost, between 2007 and 2023, to achieve one (1) aMW worth of energy savings is roughly $1.242 million.

Figure 10 – Historic Conservation



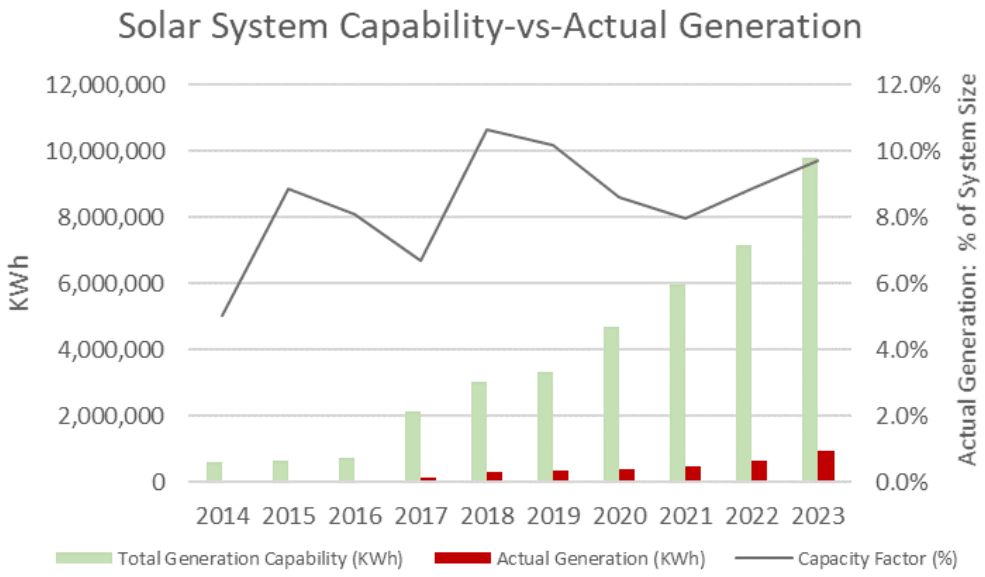
6.5. Renewables

The Utility supports a net metering program for the installation of residential and commercial solar installations (CMC 13.04.300). The Utility requires the installation of a production meter on all net metered systems. The production meter measures and records actual production of solar energy on these systems before the energy is either used by the customer or sent to the Utility's electric distribution system through the net meter. The net meter measures the amount of energy that the customer draws from the Utility's electric distribution system and the amount of energy that the customer sends to the Utility's electric distribution system if that energy is not used by the customer.

As of December 31, 2023, installed solar capacity on the Utility's electric distribution system totaled 1,117.98 KW. Figure 12 illustrates the total system capacity between 2014 and 2023. This graph shows the actual amount of generation (from production meter data) for each year. The average annual efficiency (capacity factor) of solar installations within the Utility's service territory was 9.72 percent in 2023. The annual capacity factor varies between 5.0 percent in 2014 to 10.6 percent in

2018. This variance can be attributed to annual weather conditions, solar system type, and solar system technology improvements. In 2023, the total actual production of solar energy was 0.118 aMW.

Figure 11 - Historic Solar Generation



7. PROJECTED RESOURCES

The State of Washington requires that in its projection of resources estimated to serve future loads, the Utility's plan must delineate what specific supply resources were chosen. Moreover, the Utility must provide an explanation as to why such a decision was made for the selected supply resources.

The Utility plans to utilize a mix of resources to meet its future TRL forecast in 2029 and 2034. These resources include: BPA-Tier 1; BPA-Tier 2, Yelm, Conservation, and Renewables. The Utility's goal is to support the requirements of the Clean Energy Transformation Act (CETA) which was enacted in 2019 and created RCW 19.405. The Utility intends to eliminate all sources of electricity from carbon based generation fuel sources by 2030, but is concerned that the adequacy, reliability, and resiliency of the power supply to 10,886+ customers be maintained. Projected resources requirements are 33.773 aMW for 2029 and 34.177 aMW in 2034.

7.1. BPA

During this planning cycle the Utility will need to establish a new 20-year Contract with BPA. The Utility's existing Contract was established in 2008 and expires in 2028. This first block is referred

to as Tier 1, set by the Contract High Water Mark (CHWM[5]) for each utility, and was defined by the utilities' actual 2010 loads. The Utility will continue to receive Tier 1 power from BPA for the duration of this Contract period. As of this writing, it is too early to tell what changes will be made to the P28 Contract with BPA. This resource plan assumes that the P28 Contract methodologies and allocations, between 2028 and 2034, will remain essentially the same as the Contract. It is anticipated that by the next writing of this plan in 2026, a new contract will be established and finalized.

A fundamental component of the existing TRM is BPA's RHWM[6] process which occurs on even-numbered years for the remainder of the regional dialog contract. The RHWM process is a public process in which BPA formally establishes two important values for the next two-year rate period: (a) the size of the Tier 1 System Firm Critical Output (T1SFCO) and (b) each customer's RHWM for that rate period. The Utility may then calculate ARHWM amounts for that rate period using its newly calculated RHWM and its most recently updated TRL forecasts. The ARHWM amounts are then set for the rate period. Centralia will serve its ARHWM Load using a combination of Federal and Non-Federal resources. However, if the ARHWM Load is less than one (1) aMW it may be served by BPA via load shaping charges. This Plan utilizes the RHWM of 24.371 aMW for the 2024 – 2025 period and 24.371 aMW for the 2026 – 2034 period. If the RHWM is adjusted the ARHWM amounts will be adjusted as well.

Table 6 shows BPA's load forecast along with resources that will be used to meet the forecasted loads with the impact of conservation. This table shows that the Utility will be able to meet its expected TRL only using BPA Tier 1 and Yelm generation resources. The Utility will need to purchase additional BPA Tier 2 power between 2024 and 2034.

[5] CHWM for the City is equal to 24.735 aMW and is fixed for the duration of the existing agreement between BPA and the City 09PB-13016 which expires in 2028. This represents the maximum amount of Tier 1 power that may be available to the City each year.

[6] RHWM = (CHWM / ΣCHWM) x RT1SC where: ΣCHWM = Sum of all Publics CHWM, and RT1SC = Forecast RHWM Tier 1 System Capability which is averaged for the Rate Period.

Table 4 - Load Forecast

Year	BPA Load Forecast (TRL) (aMW)	BPA Tier 1 CHWM (aMW)	BPA Tier 1 RHWM (aMW)	Yelm Generation (aMW)	TRL Less Resources (aMW)	BPA Load Shaping (aMW)	Above* RHWM (aMW)
2024	33.385	24.735	24.371	7.109	1.905	0.905	1.000
2025	33.455	24.735	24.371	7.114	1.970	0.970	1.000
2026	33.535	24.735	24.371	7.114	2.050	0.050	2.000
2027	33.614	24.735	24.371	7.114	2.129	0.129	2.000
2028	33.704	24.735	24.371	7.109	2.224	0.224	2.000
2029	33.773	24.735	24.371	7.114	2.288	0.288	2.000
2030	33.853	24.735	24.371	7.114	2.368	0.368	2.000
2031	33.932	24.735	24.371	7.114	2.447	0.447	2.000
2032	34.012	25.735	24.371	7.109	2.532	0.532	2.000
2033	34.094	26.735	24.371	7.114	2.609	0.609	2.000
2034	34.177	27.735	24.371	7.114	2.692	0.692	2.000

** This represents the amount of power that will need to be purchased.*

7.2. Yelm Hydroelectric Plant

The generating resources provided by this facility are defined within Exhibit 'A' of the Contract between the Utility and BPA. The specified resource amounts are listed in Table 7. If the Yelm plant fails to produce the amount of power (as specified within Table 7) the Utility will be placed in a resource deficient position. The Utility will need to meet this resource deficiency through acquisition of other resources (such as BPA Load Shaping or other Non-Federal resources).

If the Yelm facility were to fail, the Utility would immediately place an equal demand (about 7.109 aMW in 2024) on the BPA power system to meet its TRL at that time. BPA would then pass these additional demand impacts back to the Utility in the form of increased demand charges and power supply costs. This represents a significant risk to the Utility with the potential to create a substantial financial liability if the Yelm facility, or any of its generation and transmission assets, were to fail.

The Utility has focused its efforts in upgrading the Yelm facility to mitigate potential risks of failure. During the past several years the Utility has made significant investments in refurbishing YELM generation units, lining the canal, inspecting assets (transmission line poles), and replacing deteriorated transmission structures to improve the overall reliability of the Yelm Hydroelectric Facility. In the coming years, the Utility will need to focus its attention on reducing risks tied to the diversion of water from the Nisqually River and conveying that water over nine miles to the powerhouse.

Table 5 - Yelm Production Contractual Requirements

Year	Total (aMW)	HLH (aMW)	LLH (aMW)
2024	7.109	7.114	7.104
2025	7.114	7.129	7.126
2026	7.114	7.124	7.102
2027	7.114	7.127	7.099
2028	7.109	7.112	7.106
2029	7.114	7.129	7.126
2030	7.114	7.124	7.102
2031	7.114	7.127	7.099
2032	7.109	7.112	7.106
2033	7.114	7.129	7.126
2034	7.114	7.124	7.102

7.3. Conservation

This plan assumes that the Utility will continue to implement and participate in energy efficiency projects. Table 8 illustrates the impact of energy efficiency programs on the Utility's TRL Forecast. The TRL assumes that the Utility will continue to implement its conservation goals. If the Utility were to forego conservation efforts, it would need to acquire an additional 0.718 aMW of power by 2029 and 0.584 aMW in 2034 in order to continue to meet its expected TRL. This would result in the need to purchase an additional 1.302 aMW during this timeframe.

Table 6 - Planned Conservation Impacts

Year	BPA Load Forecast (TRL) *a*	Annual Conservation	Cumulative Conservation *b*	TRL Without Conservation *c = a + b*
2024	33.385	0.123	1.174	34.560
2025	33.455	0.120	1.294	34.749
2026	33.535	0.120	1.414	34.949
2027	33.614	0.119	1.533	35.148
2028	33.704	0.118	1.651	35.355
2029	33.773	0.118	1.769	35.543
2030	33.853	0.118	1.651	35.504
2031	33.932	0.117	1.768	35.701
2032	34.012	0.117	1.886	35.898
2033	34.094	0.116	1.767	35.862
2034	34.177	0.116	1.884	36.062

7.4. Above Rate Period High Water Mark Power

This resource plan identifies total resources needed by the Utility to meet its expected TRL in 2029 and 2034. Any of the Utility's retail loads that exceed the RHWM must be met by internal resources, additional conservation, BPA load shaping, or other Federal or Non-Federal Resources that the City acquires. The Utility's current resources provided by BPA, the Yelm Hydroelectric Facility, or conservation will not be sufficient to meet expected loads in 2029 and 2034.

As required by the TRM, the Utility will procure federal (market) Tier 2 resources to meet its ARHWM resource requirements. With these additional resources the Utility will be resource sufficient in 2029 and 2034.

7.5. Renewables

In 2023, solar production data in the Utility's service territory indicates the actual production of energy by a solar system (Capacity Factor) averages 10.99 percent of installed capacity. The average size of a residential solar installation in 2023 was 9.81 kW. As of December 31, 2023, the Utility had a total of 114 solar system connections installed in its service territory.

The Utility forecast for net-metered solar installations are shown in Table 9 and Figure 13. The forecasted resources indicate that net-metered solar installations will increase from 0.118 aMW in 2023 to 0.314 aMW in 2029 and to 0.485 aMW in 2034. The graph shows forecasted figures representing upper confidence and lower confidence beyond 2024.

If the Utility were to pursue development of a Renewable Resource, such as solar, the following considerations must be addressed. Year-to-year variations in solar radiation mean that some years a system will produce more or less energy than the typical year. Based on 30 years of historical weather data (Ryberg, 2015) for nearby Olympia, Washington, which is 17 miles north of Centralia, a Fixed (open rack) PV system has a 90% likelihood of generating at least 96% of a typical year's production (Dobos). Similarly, it has a 10% chance of generating more than 105% the typical year's output. A typical year's energy output is based on the Typical Meteorological Year (TMY) data set. The TMY for Centralia is 3.74 kWh/m2/day which is equivalent to 0.3475 kWh/ft2/day or 126.8 kWh/ft2/year. In order to produce one (1) aMW of actual solar energy in the Utility's service territory it would take approximately 69,000 square feet (or 1.6 acres) of area dedicated exclusively to solar panels.

Figure 12 - Solar Generation Forecast

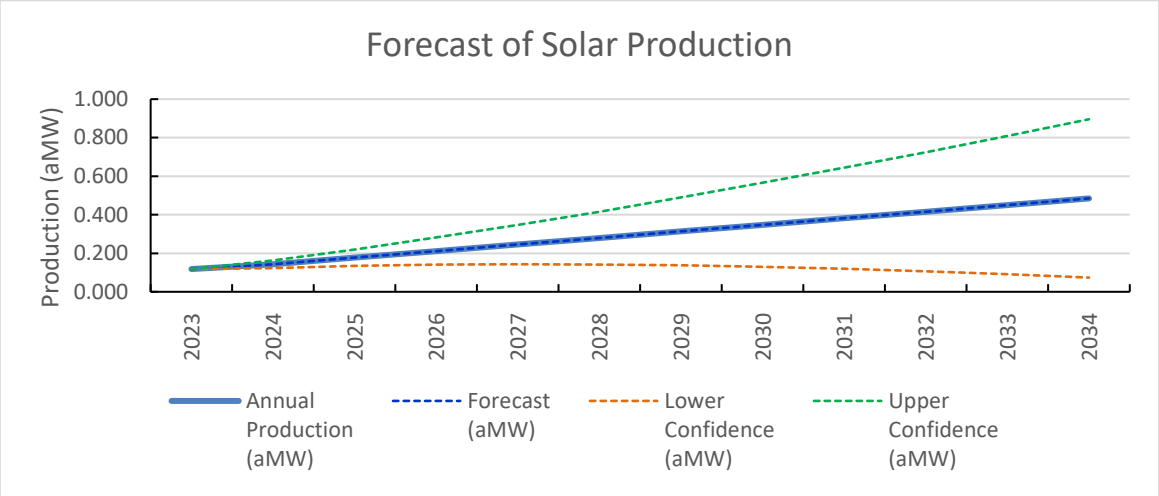


Table 7 - Forecasted Net Metered Solar

Year	Annual Production (aMW)	Forecast (aMW)	Lower Confidence (aMW)	Upper Confidence (aMW)
2023	0.118	0.118	0.118	0.118
2024	0.142	0.142	0.122	0.162
2025	0.177	0.177	0.134	0.220
2026	0.211	0.211	0.141	0.282
2027	0.245	0.245	0.143	0.348
2028	0.279	0.279	0.142	0.416
2029	0.314	0.314	0.137	0.490
2030	0.348	0.348	0.130	0.566
2031	0.382	0.382	0.120	0.644
2032	0.415	0.415	0.107	0.724
2033	0.450	0.450	0.091	0.809
2034	0.485	0.485	0.074	0.896

This could be spread out to several different locations but the Utility would need to consider distribution system requirements necessary to install the generation capacity at each location. In addition, since solar generation is only available when there is sufficient solar radiation available, such a resource would only support the Utility's TRL during a portion of daylight hours. Therefore, in order to provide support, outside of daylight hours, the Utility would need to consider development of a Utility grade battery backup system. The battery system required to support 1 aMW of capacity would conceivably need to be sized to support the power requirements outside of the normal solar generation times of the day. This can be a complicated analysis, since system demands vary throughout the day and the battery backup system would need to be sized to

accommodate the power requirements when solar radiation is zero. A detailed study would be required if the Utility were to pursue battery backup as an alternative.

For illustration purposes, let us assume that the solar system generates power 12 hours per day. In reality, this would most likely only occur during the summer months with the longest days. During winter months the number of hours of solar radiation available should be less than summer months because of the shorter winter days. If the Utility needs 12 hours of battery backup to support 1 aMW of power, it would need a 12 MWh battery backup system. This is an over simplified example but it generally lays out the potential size of what may be required in sizing a battery backup system. Without this battery backup system, it will be difficult to support the TRL demands for an entire year.

It might be in the best interest of the Utility to pursue other options than the development of renewable resources itself. If an opportunity arises for the Utility to participate in development of a Renewable Resource with another entity, the City might want to consider it.

7.6. Renewable Energy Credits (REC's)

Under Washington State Law, Utilities may purchase and use unbundled REC's to offset unspecified resource purchases made by the Utility. The Utility plans to purchase these REC's to offset unspecified purchases starting in 2030.

Unbundled REC's are the same as other REC's, as long as there is no double counting (e.g. counting null power as having renewable attributes). The "actual" sources of electricity used to serve customers can only be determined contractually and REC's are the contractual accounting instrument used in Washington to verify that a renewable energy source was used to produce the power that serves customers. REC's are not merely a Renewable Portfolio Standard (RPS) compliance mechanism, they are in fact the only credible way to verify the sources of electricity used to serve customers with renewable energy.

7.7. Nuclear

The City was one of the original utilities that invested in the construction of the Columbia Generating Station (CGS), the Pacific Northwest's only nuclear power plant. The plant is operated by Energy Northwest (EN). The plant presently produces approximately 1,200 MW of carbon-free electrical power that is sold directly to BPA. The City receives output from this facility through its purchase of power from BPA. The Utility's General Manager serves on the Board of Directors of EN.

EN is presently considering development of a Small Modular Reactor (SMR). An SMR groups up to twelve 60 MW modules that share a common cooling pond. Each one of the units can be replaced individually. The shared pond has sufficient cooling capacity so that no backup power is required to cool down the modules in the event of an emergency.

In 2011, an agreement was reached between the Centralia coal-fired generation plant owner and operator, TransAlta, and the State of Washington to decommission the coal boilers. The two identical coal-fired generating units have a combined fully-dispatchable capacity of 1,340 MW. Both units started up for commercial operation in August 1971. The first unit was shut down at the end of 2020 and the second unit will be shut down by the end of 2025. Infrastructure associated with this plant's operation include substations, transmission lines, land, and extensive dedicated water rights. This associated infrastructure will become stranded if other uses are not found for them.

One idea that has been discussed is to convert the coal-fired generation site to support an SMR. This seems to make a lot of sense, since the associated infrastructure that will become stranded could be available to support generation by an SMR. Since it can be very difficult to acquire the necessary rights to construct new transmission infrastructure and this infrastructure is already in place at the Centralia facility, placing an SMR at this site may provide a long-term source of fully-dispatchable carbon-free power to the region. This resource can be used to balance the variability associated with renewable generation resources, such as solar and wind, thereby providing the region with a reliable source of baseload power. One of the ways that the City can meet the CETA requirements for carbon-free power is to be a participant in a fully-dispatchable, carbon-free, 24/7/365 SMR installation that is free of the intermittent challenges experienced with solar and wind renewable resources.

8. CONCLUSION

The Utility's resource needs during the next five and 10 years were explored by this resource plan. The Utility should consider the following:

1. Continue to purchase BPA Tier 1 power.
2. Make improvements to the Yelm system to eliminate risks of failure and ensure power generation at the maximum allowable amount based on water availability.
3. Continue to support the Conservation program.
4. Only purchase non-federal resources when the generation source can be certified to reduce Unspecified power purchases to zero.
5. Consider partnering with other utilities if development of a Renewable Resource becomes available.
6. Develop a process, by 2030, to purchase REC's that will offset anticipated Unspecified power purchases in 2030 and beyond. Seek to supply 100 percent carbon-free power resources (with REC's) to customers by January 1, 2030.
7. Continue to support Energy Northwest and the Columbia Generating Station to develop SMR's that can provide fully-dispatchable, carbon-free, 24/7/365 power to the region.

APPENDIX A – CITY OF CENTRALIA EXTRA-LARGE SERVICE

13.04.045 Extra-large general service rate.

A. Extra-large general service rate shall be:

EXTRA-LARGE GENERAL SERVICE	2012
Greater than 1,000 kW demand	
Customer Charge—per month	same as for LARGE GENERAL SERVICE As of March 8, 2012, rates for new customers for this service or for existing customers with incremental increases in demand exceeding 1,000 kW will be covered by individual contract between the city and customer. Rates will be based on current market rate.
Energy Charge—per kWh	
Demand Charge—per kW	

B. Extra-large general service is available at:

1. Unregulated primary voltage of 7.2/12.5 kV and above at one or more points of delivery for use where the connected load is in excess of one thousand kW, and the customer owns his own primary distribution facilities, including transformers; or
2. Three-phase 480-volt secondary voltage under special arrangement with Centralia City Light.
3. In either case, subsection (B)(1) or (2) of this section, the customer shall pay for all installed facilities.

C. Available only to customers that execute a written power supply contract with the City for a period of not less than five years.

D. Loads that are determined to be new large single loads by the Bonneville Power Administration (BPA) are not eligible for this service.

E. Energy and demand amounts (kilowatt-hours and kilowatts) and power factor will be measured by meters located at or near the point(s) of delivery. (Ord. 2277 § 1, 2012: Ord. 2246 § 2 (part), 2010).

APPENDIX B – RESOURCE PLAN COVER SHEET

Resource Plan Cover Sheet

Legend

Enter your information into these shaded fields

Utility Information

Report Year	2024
Utility	Centralia, City of
Prepared by	David Hayes
Email	dhayes@cityofcentralia.com
Date of Board/Commission Approval	8/28/2024
Notes: Explain resource choices other than conservation/use of renewable energy credits	Other Distributed Renewables is from rooftop solar installation production data.

Washington State Utility Resource Plan Year 2024			
Estimate Interval	Base Year	5-year Forecast	10-year Forecast
Estimate Period	2023	2028	2033
Season	Annual	Annual	Annual
Units	aMW	aMW	aMW
Loads	31.29	33.77	34.18
Exports			
Resources:			
Energy Conservation Measures			
BTM Solar			
Demand Response			
BPA Tier 1 or Base	26.49	24.37	24.37
BPA Tier 2	0.28	0.29	0.69
Cogeneration			
Hydro	2.92	7.11	7.11
Wind			
Utility-scale Solar			
FTM Distributed Solar			
Biomass			
Biogas			
Landfill Gas			
Geothermal			
Nuclear			
Other Distributed Renewables	0.10		
Thermal Natural Gas			
Thermal Coal			
Market Purchases	1.50	2.00	2.00
Other			
Imports			
Undecided			
Total Resources	31.29	33.77	34.18
Load Resource Balance	0.00	0.00	0.00

APPENDIX C – PUBLIC COMMENTS

No comments were received by the public.

APPENDIX D – PUBLIC HEARING

The public notice and hearing required by RCW 19.280.050(1) was advertised in the local newspaper of record for Centralia (The Chronicle) on 7/27/2024 and 8/3/2024. The notice was active for a period of two (2) weeks. The public hearing was held on 8/13/2024 at 7:00pm at the City of Centralia Council Chambers.

Hearing Comments:

A public hearing was held on 8/13/2024 at 7:00pm in the City of Centralia City Council Chambers located at 118 Maple Street Centralia, WA 98531. M.L. Norton, CCL General Manager delivered a PowerPoint presentation explaining the purpose and content of the 2024 Resource Plan. The public was given an opportunity to provide written comment on this plan.

No comments were received by the public.

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