

RESOLUTION NO. 2608

August 9, 2022

**A RESOLUTION OF THE COMMISSION OF
PUBLIC UTILITY DISTRICT NO. 1 OF BENTON COUNTY, WASHINGTON,
ADOPTING THE 2022 INTEGRATED RESOURCE PLAN PROGRESS REPORT**

WHEREAS, RCW 19.280.030, requires utilities with more than 25,000 customers that are not full requirements customers to develop or update an Integrated Resource Plan (IRP), defined as an analysis describing the mix of generating resources, conservation, methods, technologies, and resources to integrate renewable resources and, where applicable, address over-generation events, and efficiency resources that will meet current and projected needs at the lowest reasonable cost to the utility and its ratepayers, by September 1, 2008; AND

WHEREAS, RCW 19.280.030, also requires, at a minimum, progress reports reflecting changing conditions and the progress of the integrated resource plan to be produced every two years thereafter and an updated integrated resource plan to be developed at least every four years subsequent to the 2008 integrated resource plan; AND

WHEREAS, RCW 19.280.050, requires each consumer-owned utility to transmit a copy of its plan to the Department of Commerce by September 1, 2008, and transmit subsequent progress reports or plans to the department at least every two years thereafter; AND

WHEREAS, in 2019, RCW 19.280.030 was amended with the passage of the Clean Energy Transformation Act (CETA) to include additional IRP requirements; AND

WHEREAS, The Energy Independence Act (EIA) approved in 2006 requires all utilities with customers exceeding 25,000 to meet 3% of their load by 2012, 9% of their load by 2016, and 15% of their load by 2020 with qualifying renewable resources; AND

WHEREAS, The District's last IRP update (the "2020 IRP") was adopted by Commission Resolution No. 2549 on August 11, 2020; AND

WHEREAS, The District has developed a 2022 IRP Progress Report to reflect the changing conditions and progress since the 2020 IRP; AND

WHEREAS, RCW 19.280.050 requires the governing body of a consumer-owned utility that develops an IRP to encourage participation of its consumers in development and approval of the plans and progress reports after it has provided public notice and hearing; AND

WHEREAS, A notice of the July 26, 2022 Commission review of the draft 2022 IRP Progress Report was published on July 22, 2022, and on July 26, 2022 the Commission approved a motion setting a Public Hearing on the final draft for August 9, 2022, at 9:00 a.m., to allow additional public comment prior to the commission considering final approval and adoption; AND

WHEREAS, A notice of the August 9, 2022 Public Hearing was published on August 5, 2022;
AND

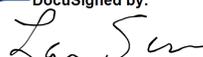
WHEREAS, On August 9, 2022 the Commission closed the public comment period regarding the District's 2022 Integrated Resource Plan Progress Report.

NOW THEREFORE BE IT RESOLVED that the Commission of Public Utility District No. 1 of Benton County approves and adopts the attached 2022 Integrated Resource Plan Progress Report.

APPROVED AND ADOPTED By the Commission of Public Utility District No. 1 of Benton County at an open meeting, with notice of such meeting being given as required by law, this 9th day of August, 2022.

DocuSigned by:

69B2EFD7319E4CC
Jeffrey D. Hall, Secretary

DocuSigned by:

D78F53D0CFE13435
Lori Kays-Sanders, President

PUBLIC UTILITY DISTRICT NO. 1
OF BENTON COUNTY
2022 INTEGRATED RESOURCE PLAN
PROGRESS REPORT

AUGUST 2022

PREPARED IN
COLLABORATION WITH
THE ENERGY AUTHORITY



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Section 1: Overview

Washington State Law

Public Utility District No. 1 of Benton County (the District) is required by Washington State law, Chapter 19.280 of the Revised Code of Washington (RCW), to develop an integrated resource plan (IRP) that explains the mix of generation and demand-side resources it plans to use to meet its customers' electricity needs in both the short term and the long term. State law requires, at a minimum, progress reports reflecting changing conditions and the progress of the IRP to be produced every two years and an updated IRP must be developed at least every four years (RCW 19.280.030).

Additionally, state law requires the governing body of a consumer-owned utility that develops a plan to encourage participation of its consumers in development of the plans and progress reports and to approve the plans and progress reports after it has provided public notice and hearing.

Reporting Cycle

The District's last IRP (the "2020 IRP") was adopted by Commission Resolution No. 2549 on August 11, 2020 and is available for review on the District's Resource Planning website.¹ This 2022 IRP Progress Report is intended to reflect the changing conditions and progress since the 2020 IRP and is not considered a full update of the IRP. The District's next full IRP update, per the four-year requirement, will be in 2024.

The Washington State Department of Commerce (DOC) also requires annual submittal of an IRP reporting "cover sheet" that is essentially a listing of the District's loads and resources, with annual energy and seasonal peaks identified for a base year and a 5-year and 10-year outlook. The District will be submitting the final adopted 2022 Progress Report and its 2022 IRP cover sheet to DOC by the September 1 deadline. Refer to the DOC website for a copy of the cover sheet.²

Progress Report Layout

Section 2: Changing Conditions is a high-level summary of the major changes, since the 2020 IRP, focused on those changes related to the District's load and resource balance and its resource strategy. Some of the changes may use footnote references to point the reader to additional details within Section 3. For discussion on other changes in the industry, refer to those topics within the context of the Section 3 progress report.

Section 3: Action Plan Progress includes two tables that list every action item from the 2020 IRP action plan (Table 3-1), including the Clean Energy Action Plan (Table 3-2), and then includes a progress report write-up for each action item.

Appendix A: Price Forecasts includes natural gas and power market price forecasts prepared by The Energy Authority (TEA) in conjunction with this progress report.

¹ <https://www.bentonpud.org/About/Planning-Performance/Integrated-Resources-Plan>

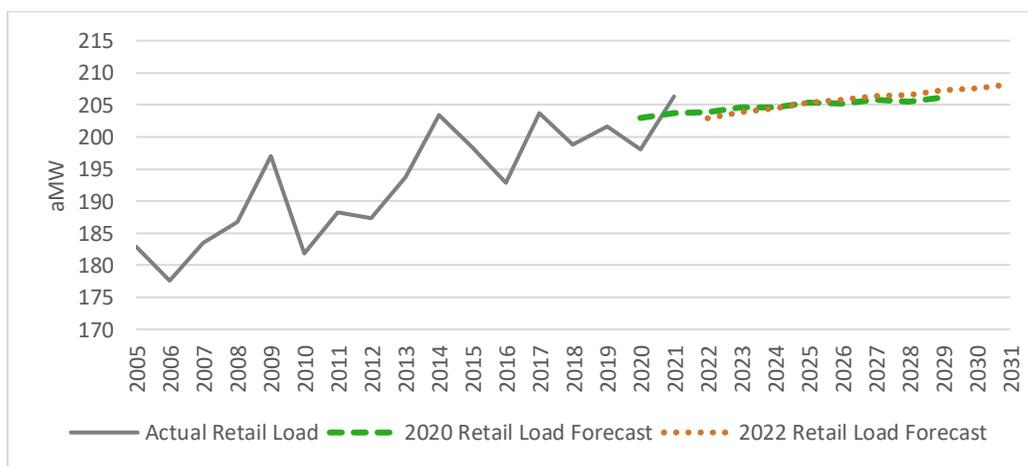
² <https://www.commerce.wa.gov/growing-the-economy/energy/utility-resource-plans/>

Section 2: Changing Conditions

Loads

The District’s ten-year load and customer forecast was updated in April 2022 and it incorporated an updated Conservation Potential Assessment (CPA) that was completed in October 2021.³ The 2022 load forecast only varies moderately from the base case forecast used for the 2020 IRP. The annual variance was one average megawatt or less for each of the eight overlapping years in the forecasts for the period 2022 through 2029. The 2022 base case scenario forecasts an average annual rate of growth (AARG) of 0.29% for retail load, compared to the 0.17% AARG forecast in 2020.

Figure 2-1 – Annual Retail Load Forecast



Resources

Most of the District’s power supply continues to be supplied under long-term contract by the Bonneville Power Administration (BPA) through their Slice and Block products. The District also has long term contracts with three renewable projects: Nine Canyon Wind (through July 1, 2030), White Creek Wind (through December 31, 2027), and Packwood Lake Hydroelectric (ongoing). The District’s contract for 50 MW of the Fredrickson natural gas combined cycle unit expires August 31, 2022. Lastly, the District has a seasonal capacity, heavy load hour, call option contract in place for 2022 through 2025, for 25 MW in December, January, and February and 75 MW in July and August.

Besides the Fredrickson contract ending, the only changes to the District’s existing resources, since the 2020 IRP, has been BPA’s adjustment of the District’s rate period high water mark (RHWM) allocation—the amount of energy available to purchase at Tier 1 rates—which is subject to change during each two-year rate period, per the BPA Slice contract. Since the completion of the 2020 IRP analysis, the District’s RHWM allocation is anticipated to be a net increase by 0.709 aMW, effective October 1, 2023, based on BPA’s preliminary RHWM calculations for fiscal years 2024-2025.⁴

³ Refer to the District’s Resource Planning website (see footnote 1) for a copy of the 2022 load forecast and the 2021 CPA. Additionally, refer to Item #4 of Table 3-1 for more details about the 2021 CPA.

⁴ For additional details on RHWM changes since the 2020 IRP, refer to Item #6.d of Table 3-1.

Load & Resource Balance

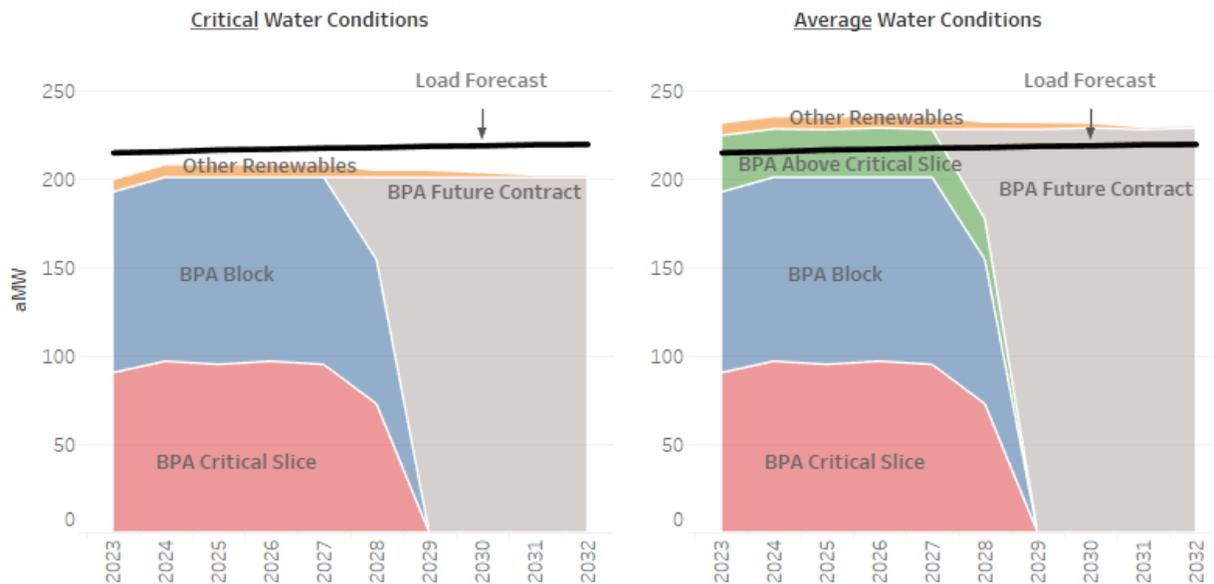
The load and resources presented in this section reflect the changes since the 2020 IRP, including BPA’s preliminary fiscal year 2024-2025 RHWM values, as detailed below in Table 2-1.

Table 2-1 – 10-Year Annual Average Net Position^{5,6}

Resource Name	Calendar Year									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Packwood Hydro	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Nine Canyon Wind	2.7	2.7	2.7	2.7	2.7	2.7	2.7	1.4	0.0	0.0
White Creek Wind	3.0	3.0	3.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0
BPA Future Contract	0.0	0.0	0.0	0.0	0.0	50.7	228.0	228.9	228.0	228.9
BPA Above Critical Slice	32.0	27.3	26.9	27.9	27.0	23.0	0.0	0.0	0.0	0.0
BPA Critical Slice	90.4	96.9	95.1	96.9	95.1	72.8	0.0	0.0	0.0	0.0
BPA Block	102.2	104.1	105.9	104.1	105.9	81.7	0.0	0.0	0.0	0.0
Total Resources (aMW)	231.8	235.5	235.1	236.1	235.2	232.4	232.2	231.8	229.5	230.4
Load Forecast (aMW)	215.2	215.8	216.9	217.3	217.9	218.2	218.9	219.2	219.8	219.9
Net Position (Average Water)	16.6	19.7	18.2	18.8	17.3	14.2	13.3	12.6	9.7	10.5

Figure 2-2 below, compares the District’s load to its resources under critical hydro conditions (left) and average hydro conditions (right). The District’s existing resources are not sufficient under critical water conditions, however, under average water conditions the additional Slice generation (“BPA Above Critical Slice”) is enough to remain in load and resource balance on an annual basis beyond 2032.

Figure 2-2 – 10-Year Annual Average Load & Existing Resources



⁵ The 2020 IRP included a small energy contribution from the District’s seasonal on-peak capacity contract in its evaluation of annual average energy; this was an error. For this report, the call option has been excluded from Table 2-1 and Figure 2-2.

⁶ “BPA Future Contract” is a continuation of the District’s existing Slice/Block contract amount, for reference only, and is not intended to represent any decisions as to which BPA product the District may select in the future.

While Figure 2-2 is showing that the District has sufficient resources, assuming average water on an annual average basis, it is well understood that these resources do not have the capacity to serve all the District's load during seasonal peak periods and therefore the District relies on the wholesale market to make up these deficits, per the resource strategy discussed in the next section.

Resource Strategy

Energy & Capacity

The District's 2020 IRP preferred portfolio and resource strategy called for continuing to utilize market purchases, hedged by financial products to gain price certainty, to cover forecasted energy and capacity deficits. Additionally, the 2020 IRP strategy called for purchasing a second capacity call option to reduce reliance on the market during peak load events, to insure against the growing risk of physical generation shortfalls in the region, and to maintain the District's flexibility to continue utilizing market purchases when it is more economic.

Per the 2020 IRP strategy and IRP Action Item #1, the District issued a request for proposals in the Fall of 2020 to procure a second capacity call option for the Summer and Winter periods beginning December 2025 through August 2028. The District evaluated the limited responses and made the decision to not move forward with any of the responses and to instead explore other emerging options to meet forecasted energy and capacity deficits, including the option of changing from the BPA Slice/Block product to the Load Following product. On June 30, 2022, BPA confirmed that it will allow the District a one-time option to change to the Load Following product effective October 1, 2023, through the existing contract end date of September 30, 2028.⁷

The District is currently in the process of assessing the costs, risks, and opportunities of changing its BPA purchase obligation and will be bringing this emerging resource strategy to its Commission in September 2022 for consideration. If the District decides to move forward with a conversion to the full requirements Load Following product, BPA requires the District to provide written notice by October 31, 2022.

Renewable Portfolio Compliance

The District has acquired sufficient renewables resources and renewable energy credits (RECs) to comply with the 15% Renewable Portfolio Standard (RPS) requirement through 2024. Beginning in 2025, the District will need to acquire additional RECs to meet its RPS requirement, which is the same timing as reported in the 2020 IRP. To meet this obligation, the District will continue with the primary strategy of purchasing unbundled RECs from the market, consistent with the 2020 IRP strategy. The details of the District's RPS and REC net position are shown below in Table 2-2. Also refer to this topic within Item #5 of Table 3-1.

⁷ For more details on this IRP action item and the one-time option to change to Load Following, refer to Item #1 of Table 3-1.

Table 2-2 – Renewable Portfolio Standard & Renewable Energy Credit Net Position

	Calendar Year									
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
RPS Requirement %	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
RPS Load Basis aMW	204.6	203.3	204.1	204.9	205.6	206.1	206.5	207.0	207.4	207.9
RPS Requirement aMW	30.7	30.5	30.6	30.7	30.8	30.9	31.0	31.0	31.1	31.2
REC Contracts										
IWP	4.0	4.0								
Biofuels	7.5	7.5	7.5							
White Creek	2.7	2.7	2.7	2.7	1.8					
BPA	3.7	3.4	3.4	3.4	3.0	2.5				
3Degrees	6.8	6.8	6.8	6.8	6.8	6.8				
RPS Advisors	4.6	4.6	4.6	4.6	4.6	4.6	4.6			
Nine Canyon	2.7	2.7	2.7	2.7	2.7	2.7	2.7	1.4		
Contract Total aMW	32.0	31.8	27.8	20.2	18.9	16.6	7.3	1.4		
RPS Net Position	1.3	1.3	-2.8	-10.5	-11.9	-14.3	-23.7	-29.7	-31.1	-31.2

Transmission

Since the 2020 IRP, the District has made the decision to convert its BPA transmission contract from point-to-point (PTP) to network (NT) transmission service. As a part of the BPA Fiscal Years 2020-2021 Rate Case and Terms and Conditions Settlement Agreement in December of 2018, BPA agreed to provide two transmission conversion opportunities, one prior to BPA Fiscal Years 2022-2023 rate period and one prior to the BPA Fiscal Years 2024-2025 rate period. Since the 2020 IRP, the District participated in the second conversion window and has consulted with both BPA and The Energy Authority to analyze impacts and to make a determination around a potential transmission service change. District staff conducted a quantitative and qualitative analysis in 2021. The analysis showed that the average annual savings over the 5-year study period (2016-2020) would have been approximately \$220,000 (≈\$1.1 million in total over the five-year period). Additionally, the NT product has a higher scheduling priority than the PTP product. This means that in the event curtailment is required due to transmission congestion on a particular transmission path on the BPA transmission network, the Firm NT product would be the last to be curtailed.

The District Commission, at its June 7, 2022 meeting, approved a motion authorizing the General Manager to execute the agreements with BPA necessary to proceed with the conversion from PTP to NT transmission service effective October 1, 2023 through the existing PTP contract end date of September 30, 2031. The District will also amend its BPA PTP contract and reduce the total transmission capacity from 423 MW to 1 MW. BPA identified through their review of the conversion that 1 MW of the PTP transmission contract was ineligible for conversion; however, it can be utilized for secondary market sales of surplus Slice generation. The District expects to execute the related agreements by August 2022.

Section 3: Action Plan Progress

Refer to the following tables for a description of the District’s progress on its 2020 IRP action items:

- **Table 3-1, Progress on 2020 IRP Action Plan**
- **Table 3-2, Progress on 2020 IRP Clean Energy Action Plan**

Table 3-1, Progress on 2020 IRP Action Plan

#	2020 IRP Action Item	2022 IRP Progress Report
1	<p>Issue a Request for Proposal (RFP) before the end of 2020 for seasonal capacity products to cover 75 MW of summer (July/August) capacity deficits and at least 25 MW of winter (December/January/February) capacity deficits for the term of December 2025 through August 2028. These are the same values used in a District RFP used to secure capacity for December 2022 through August 2025. RFP will include product definitions to meet the expected future Northwest Power Pool (NWPP) Resource Adequacy (RA) program requirements. Capacity purchases resulting from this RFP process are expected to cover a portion of the District’s possible seasonal energy shortfalls based on historical data and the probability of similar future outcomes.</p>	<p>The District issued an RFP in the Fall of 2020 to procure capacity products for the Summer and Winter periods beginning December 2025 through August 2028. The District evaluated the limited responses and made the decision to not move forward with any of the responses and to explore other emerging options to meet the needs.</p> <p>In 2021, the District participated in discussions between BPA and some Slice customers around BPA providing additional capacity to preference customers that need additional capacity to meet the Western Resource Adequacy Program (WRAP) requirements (see Action Item #2). Those discussions continued into 2022 along with larger group discussions around BPA capacity as part of the Post-2028 Contract process.</p> <p>Also in 2021, the District initiated discussions directly with BPA about a possible product switch from Slice/Block to Load Following. The District sent a letter to BPA on November 12, 2021, requesting an option to switch products. BPA subsequently offered all Slice/Block customers the opportunity to submit a formal request by March 31, 2022, so they could complete a collective analysis and determination if BPA would allow a product switch, including identification of any cost shifts. BPA issued a letter to the region with their analysis on June 10, 2022 and requested public comment by June 24, 2022. BPA issued a final close out letter on June 30, 2022, concluding that BPA <u>will</u> allow the requesting utilities a one-time option to change to the Load Following product, effective October 1, 2023, and requiring each requesting utility, by October 31, 2022, to provide BPA with written notice whether it wishes to proceed with a change to its purchase obligation.⁸</p>
	<p><i>Items 1.a through 1.d below are not action items themselves, rather these were the contributing factors listed in the 2020 IRP under Action Item #1.</i></p>	<p><i>Items 1.a through 1.d below, continue to be significant concerns as the District evaluates the emerging resource strategy of a possible BPA contract change to Load Following and how the strategy may address these same concerns. The District is continually monitoring related regional studies, including, but not limited to BPA’s Resource Program, the Western Electricity Coordinating Council’s (WECC) Western Assessment of Resource Adequacy, and the Northwest Power and Conservation Council’s (NWPPCC) Annual Adequacy Assessment.</i></p>
1.a	<p><i>The District has significant seasonal capacity deficits that cannot be reliably addressed with renewable energy resources such as wind and solar due to the intermittent nature of these technologies, specifically during long duration summer heat and winter cold events that often occur within our service territory. Battery technology is not expected to be economic or operationally proven as a way to mitigate wind and solar intermittency through 2028 which is a key District planning milestone aligned with the beginning of the new Bonneville Power Administration contract term.</i></p>	
1.b	<p><i>Regional generation resource adequacy is projected to continue to decline over the initial planning horizon due to the early retirement of coal-fired resources and the lack of firm plans by utilities to build new dispatchable capacity. The Northwest Power and Conservation Council projects the loss of load probability (LOLP) could increase to 26% by 2026 which is well above the 5% threshold used as a regional standard for adequacy.</i></p>	
1.c	<p><i>The adoption of the Clean Energy Transformation Act (CETA) law in 2019 requires the elimination of coal-fired resources to serve retail load in Washington state and includes regulatory hurdles established to disincentivize new natural gas fired resources from being built in the region. The District believes the anti-fossil fuel bias of CETA will increase the demand for existing dispatchable capacity which is limited and already included in the LOLP calculations which show the region is short.</i></p>	
1.d	<p><i>A limited number of independent power producers (IPP) with dispatchable capacity are available in the region which the District believes will be in high demand as utilities try and firm up their share of the capacity void left by coal-plant retirements while also meeting new regional resource adequacy standards being developed by the NWPP.</i></p>	

⁸ <https://www.bpa.gov/-/media/Aep/power/regional-dialogue/2022-product-change-closeout-letter-20220701.pdf>

#	2020 IRP Action Item	2022 IRP Progress Report
2	Engage in the NWPP resource adequacy standard development and implementation processes with the intent of participating in the voluntary program. Procure additional capacity when needed to meet the District's compliance with the RA program's seasonal forward showing requirements, which is expected to include a planning reserve margin.	<p>As of October 2021, the District and 6 other utilities partnered to enable The Energy Authority (TEA) to be the aggregate Load Responsible Entity participating in the non-binding Phase 3A stage of the Western Power Pool's (formerly Northwest Power Pool) Western Resource Adequacy Program (WRAP). Learnings from Phase 3A of the WRAP (Oct 2021 to Dec 2022) will be used to develop a recommendation by December 2022 for participating, or not, in the Phase 3B that begins Jan 2023, but does not transition to binding until Summer 2025 or later.⁹</p> <p>Procurement of any additional capacity is on hold while the District considers the option of switching its BPA contract from Slice/Block to Load Following (see Action Item #1). The District is also monitoring BPA's decision on joining WRAP. BPA has indicated that under WRAP, BPA would have the resource adequacy obligation on behalf of its Load Following customers. BPA is still working on a proposal for how it will handle Above High-Water Mark (AHWM) and New Large Single Load (NLSL) within WRAP. BPA expects to post a draft close-out letter in early October 2022, receive comments for 30-days and then post the final close-out letter in December 2022.</p>
3	Seasonal energy deficits above the 75MW/25MW summer/winter capacity procurements identified previously (plus additional capacity subsequently acquired to meet NWPP RA standards) will be met through short-term wholesale market purchases hedged by financial products acquired in a 3-year purchase/sale window through the District's existing Risk Management Committee (RMC) process.	The District's RMC continues to convene monthly to review its power supply portfolio and hedge supply and price risk for a rolling 36-month period. Each month market fundamentals, forward market prices, hydrological conditions, procurement strategies and hedging recommendations are reviewed and discussed. With formal RMC approval, said strategies to balance the District's load and resources, fill seasonal energy deficits and sell energy surpluses are executed in a systematic fashion by TEA.
4	<p>Implement all cost-effective conservation consistent with the requirements and any future amendments of the Energy Independence Act.</p> <p>a. The most recent Conservation Potential Assessment (CPA) adopted by the Commission in September 2019 includes 11.62 aMW of cost-effective conservation over 10 years.</p> <p>b. Targets in subsequent CPAs, conducted every two years, will continue to evolve as inputs change over time.</p>	<p>The District has consistently met its biennial energy efficiency targets. For the 2020-2021 biennium, the target was 1.71 aMW and the District achieved 3.27 aMW, as reported to Commission May 10, 2022, and subsequently submitted to the Department of Commerce. On October 26, 2021, the Commission adopted an updated CPA, which is available on the District's Resource Planning website (see footnote 1).</p> <p>The 2021 CPA identified the following cost-effective conservation potential:</p> <ul style="list-style-type: none"> • 2-Year (2022-2023) 1.52 aMW • 4-Year (2022-2025) 3.59 aMW • 10-Year (2022-2031) 11.72 aMW
5	RPS requirements will be met by executing new Renewable Energy Credit (REC) purchase contracts as existing REC purchase contracts begin to expire in 2024.	The District has consistently met the annual Renewable Portfolio Standard (RPS) requirements, which currently require the District to acquire certain eligible renewable resources to serve at least 15% of its total annual retail customer demand. Historically, the District has annually retired renewable energy credits associated with its long-term power supply contracts for the White Creek and the Nine Canyon wind projects, BPA Tier 1 REC allocation, and then procured additional quantities from the REC market when needed. The District will continue to use REC purchases to meet part of its 15% RPS requirement and as a clean energy strategy to backfill behind long-term renewable contracts as they expire. Refer to Section 2 and Table 2-2 for additional details on the District's REC and RPS net position.

⁹ Some WRAP details are subject to non-disclosure. Refer to WPP's website for public information, <https://www.westernpowerpool.org/about/programs/western-resource-adequacy-program>

#	2020 IRP Action Item	2022 IRP Progress Report
6	<p>Complete resource/market related analyses and studies to enhance the 2022 IRP process, inputs, and resource acquisition evaluations including the following:</p> <ul style="list-style-type: none"> a. The District will investigate alternative approaches for risk simulation analysis to account for peak loads and capacity needs consistent with the requirements of the NWPP regional RA initiative. This approach should be identified by 9/1/2021. b. Develop a white paper that describes a process for determining a Levelized Cost of Capacity for use in the 2022 IRP process. Complete by 8/31/2021. 	<p>During 2021, the District engaged The Energy Authority (TEA) to perform a holistic review of its long-term utility planning processes and to realign the approach. The result of this review has been the development of a white paper that describes a multiple step process to assess loads and resources at an hourly level across the study period to determine the magnitude, duration, and frequency of the District’s future resource needs. This level of modeling granularity will provide greater insights into monthly and seasonal peak capacity needs and will inform resource adequacy and energy and capacity planning standards. In addition, an improved resource screening methodology will assess the contribution of new resources, demand response and energy storage technologies to serving identified peak needs and the associated cost for that contribution. This multi-step process to assess load and resources results in new metrics that can guide resource additions that best meet District forecast future needs. The whitepaper “Integration of Resource Adequacy Methodologies for Utility Planning,” was finalized in March 2022 and documents this revised long-term resource planning approach and methodology.</p>
6.c	<p>Explore how to and consider developing a demand response potential assessment and supply curves that could be implemented in synergy with the District’s smart meters as a potential resource for meeting hourly peak loads.</p>	<p>In 2021, the District contracted with EES Consulting to complete the District's first Demand Response Potential Assessment (DRPA) in conjunction with the routine task (updated every 2 years) of completing the District's 2021 Conservation Potential Assessment. EES completed the CPA in Oct and the DRPA in Nov 2021 and it's expected that both will be updated every two years going forward. The District also contracted in 2022 with IRZ Consulting to explore demand response opportunities for agricultural irrigation customers. The District is still evaluating the DRPA results and developing its demand response strategy, with a Commission workshop planned for Fall 2022. The DRPA (and CPA) will be updated again in 2023 and will serve as an input into the 2024 IRP analysis to determine if demand response is a cost-effective, feasible and reliable resource.</p>
6.d	<p>The District will monitor BPA’s FY2022/2023 rate period high water mark process, analyze the impact of reduced BPA generation due to the change in hydro operations as outlined in the preferred portfolio identified in the Columbia River System Operations Final Environmental Impact Statement (EIS), and incorporate the results of the analysis into future power supply planning including the District’s 2022 IRP update.</p>	<p>Every two years, BPA has a public process—the Rate Period High Water Mark (RHWM) process¹⁰—to determine the size and allocation of the BPA Tier 1 Firm Critical System Output for the next rate period. The District routinely monitors this process and incorporates any changes into its power supply planning.</p> <p>In May 2020, as the District was preparing the 2020 IRP report, BPA published preliminary values for fiscal years 2022-2023 showing the District’s RHWM allocation being reduced by 8.213 aMW (from 200.214 to 192.001 aMW). In September 2020, BPA published its final RHWM values for fiscal years 2022-2023, which matched the preliminary values. The reduction was primarily due to spill pattern changes for fish and other recommended system and configuration improvements as outlined in the preferred portfolio of the Columbia River System Operations Final EIS. Given that the 2020 IRP analysis was completed prior to BPA releasing the preliminary values, the 2020 IRP continued to reflect the RHWM derived from the fiscal year 2020-2021 process (200.214 aMW).</p> <p>In March 2022, separate from the BPA RHWM process, the District’s slice allocation was modified due to a small portion of load being annexed by the City of Richland, resulting in a RHWM decrease of 0.199 aMW (from 192.001 to 191.802 aMW).</p>

¹⁰ <https://www.bpa.gov/energy-and-services/rate-and-tariff-proceedings/rate-period-high-water-mark-process>

#	2020 IRP Action Item	2022 IRP Progress Report
		As of June 2022, BPA’s preliminary RHWI analysis for fiscal years 2024-2025 is showing an increase of 8.922 aMW (from 191.802 to 200.923 aMW). The increase is primarily attributed to BPA’s decision to move away from defining critical water as the 1937 water year and instead using the monthly tenth percentile (P10) of recent 30 years (1989-2018). Other factors contributing to the increase include BPA incorporating changes to streamflow data, water supply forecasts and project operations. BPA expects to have final numbers by September 30, 2022. This report is using the preliminary values in Table 2-1 and Figure 2-2.
6.e	<p>Prepare a study about post-2028 BPA product offering in 2021 as additional information is available.</p> <p>a. Evaluate scenarios of BPA supply of energy, capacity, and non-emitting attributes.</p> <p>b. Include various changes in the BPA resource, BPA augmentation, and regional loads placing Net Requirements on BPA.</p>	The District continues to participate and engage in regional discussions and with BPA regarding post-2028 BPA product offerings, product enhancements and various policy determinations. Public power delivered a Conceptual Framework document to BPA in March 2022 and then BPA unveiled its Provider of Choice Concept Paper on July 14, 2022. ¹¹ Policy meetings will continue into fiscal year 2023 and contract negotiations are planned for early 2024 to mid-2025, to be followed in September 2025 by release of the contract policy record of decision. Contract offers and executions are slated to run from September to December 2025.
6.f	If significant new industrial load (greater than 10 MW) commits to the District’s service territory or the District experiences a sudden increase in commercial and light industrial load (greater than 5 aMW), prepare a report that analyzes the impacts on energy purchases and transmission infrastructure.	The District has not added any new loads of the size and type described; however, the District does frequently receive exploratory inquires and therefore is continually considering the potential for such loads and how to incorporate into our power supply and distribution system planning.
6.g	Monitor the cost and availability of regional developments of pumped hydro storage, solar plus storage, and standalone battery storage.	As part of resource planning efforts, the District both monitors changes to and works with third parties to refresh cost and availability information for regional resource development (e.g., Montana wind resources, solar plus storage, community solar and battery projects, etc.). This information will be an input to future IRP updates.
6.h	The District will analyze the impacts of the CAISO’s proposed Enhanced Day Ahead Market (EDAM) on the recommendation to use the market as the preferred portfolio to meet energy needs. The District is concerned EDAM could reduce market liquidity for bi-lateral transactions in northwest wholesale electricity markets.	The CAISO’s proposed EDAM came to a halt following a summer heat event that caused rolling blackouts in California in August 2020. The CAISO put all policy initiatives on hold at the time to focus on market enhancements needed to operate reliably for Summer 2021. The EDAM effort relaunched in October 2021 with renewed focus and momentum. With this lull in advancement, Southwest Power Pool (SPP) introduced a Markets Plus concept that builds from the Western Resource Adequacy Program and has rallied some interest. As day ahead markets are being discussed in the region, it is not clear which approach may prevail. While market liquidity for bilateral transactions in the Northwest’s wholesale electricity markets is a legitimate concern, governance and California-centric market design issues associated with any CAISO extended day-ahead market initiative also must be addressed. The District notes the lack of synchronization between the CAISO’s centralized transmission structure and the transmission rights structure in the Pacific Northwest. The differences in practices are currently a barrier to expanding the CAISO’s day-ahead market footprint. The District will continue to monitor and stay apprised of evolving markets through its participation in Public Generation Pool and through TEA.

¹¹ <https://www.bpa.gov/energy-and-services/power/provider-of-choice>

#	2020 IRP Action Item	2022 IRP Progress Report
6.i	<p>The District will continue to monitor the regulatory environment and modify its resource strategy as necessary, including reviewing PURPA regulation changes and closely monitoring CETA rulemaking for impacts to this action plan.</p>	<p>Regarding the Public Utility Regulatory Policies Act of 1978 (PURPA), the District monitored two items since the 2020 IRP: 1) On July 16, 2020, The Federal Energy Regulatory Commission (FERC) approved a final rule to modernize portions of PURPA.¹² These revisions do not impact the District at this time. 2) The 2021 Infrastructure Investment and Jobs Act (IIJA) amended PURPA section 111(d) to add two new “must consider” standards; numbered and titled as (20) demand response practices; and (21) electric vehicle charging programs. The District is currently evaluating the IIJA requirements and its related PURPA changes.¹³</p> <p>In 2019, Governor Inslee signed the Clean Energy Transformation Act (CETA) into law. CETA established milestones for utilities to be greenhouse gas neutral by 2030 and carbon free by 2045. Refer to Table 3-2, Progress on 2020 IRP Clean Energy Action Plan, for details on the District’s progress to comply with CETA.</p> <p>During the 2021 legislative session, Washington state passed the Climate Commitment Act (CCA). This legislation established a cap-and-trade program to reduce emissions economy wide in Washington state beginning on January 1, 2023. The goal of the program is to achieve state emissions reductions to 45% of 1990 levels by 2030, 70% of 1990 levels by 2040, and 95% of 1990 levels by 2050. The specific program mechanisms for the allocation and distribution of no-cost allowances and other compliance details are making their way through the Department of Ecology rulemaking process. The District will have a better sense of how to model impacts associated with incremental portfolio emissions and carbon allowances in future IRP updates.</p> <p>Both CETA and CCA, include numerous reporting and compliance obligations for the District and requirements that may impact the IRP process. Since rulemaking for both CETA and CCA are expected to continue through 2022, staff will continue to participate and reflect these requirements in its future IRP analysis.</p>
6.j	<p>The District will continue to monitor energy economic fundamentals to ensure that its resource strategy provides rate payers with low cost energy with a low level of risk. Major changes to price and volatility of wholesale electricity, natural gas, and REC s may require changes to the District’s plan.</p>	<p>The District’s RMC and power planning staff monitor and evaluate energy economic fundamentals monthly and continually evaluate the impact on the District’s resource strategy. Refer to Appendix A: Price Forecasts for natural gas and power market price forecasts prepared by TEA in conjunction with this report.</p>
6.k	<p>The District will assess the 2021 White Creek Wind purchase option.</p>	<p>In 2008 the District started purchasing renewable energy from the 205 MW White Creek Wind project located in Goldendale, Washington and the contract extends through 2027. The District’s agreement had the option to consider purchasing or extending its offtake from the wind project. In 2021 the District completed its analysis and elected not to move forward with purchasing or extending its offtake.</p>

¹² <https://www.ferc.gov/news-events/news/ferc-modernizes-purpa-rules-ensure-compliance-reflect-todays-markets>

¹³ <https://www.cooperative.com/conferences-education/web-based-learning/Pages/PURPA-111d-What-Coops-Need-To-Know.aspx>

Table 3-2, Progress on 2020 IRP Clean Energy Action Plan

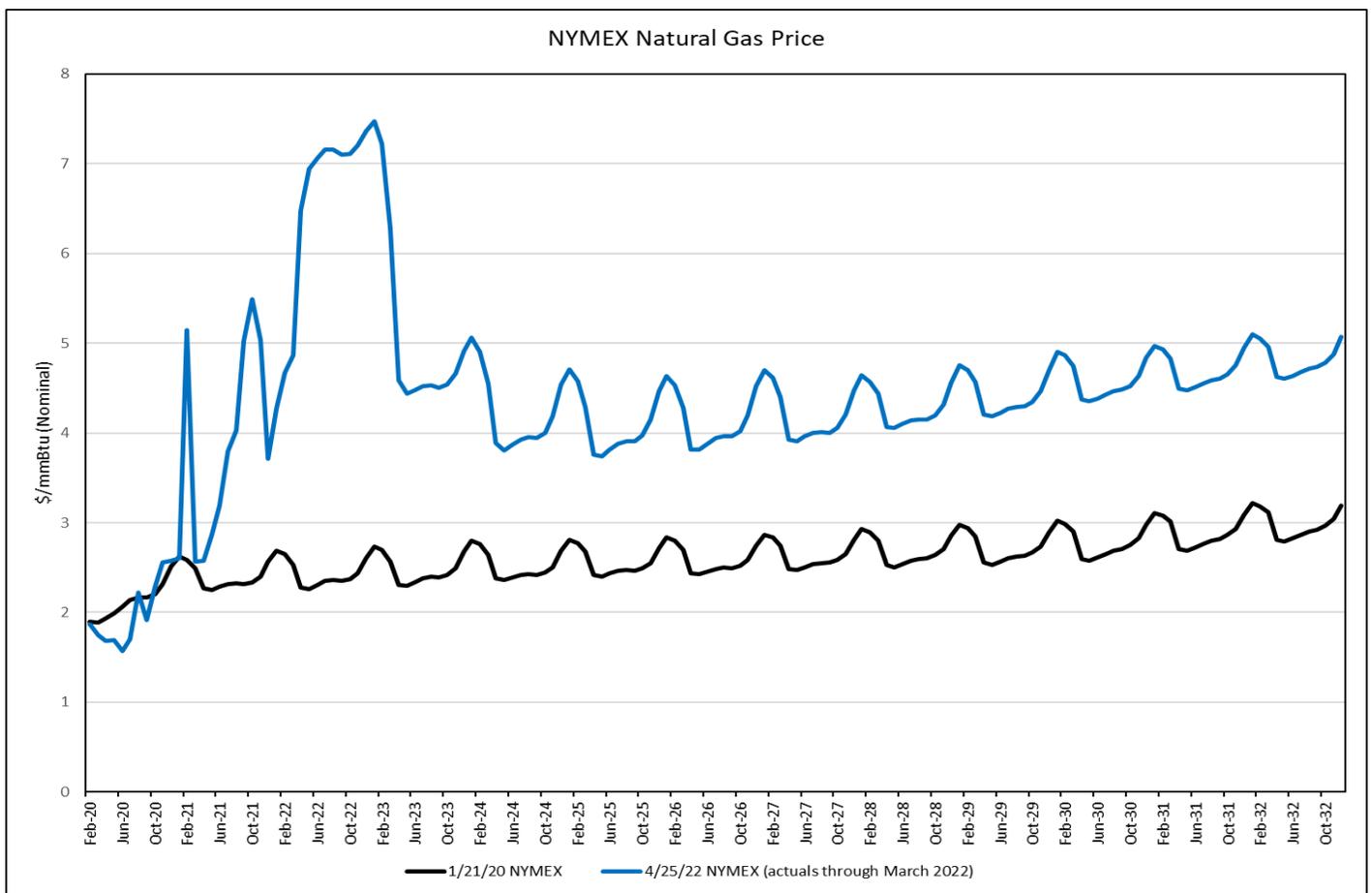
#	2020 IRP Clean Energy Action Plan (CEAP)	2022 IRP Progress Report														
1	<p>RCW 19.405.030 – Elimination of coal-fired resources by 12/31/2025</p> <p>a. The District will continue its practice of making market purchases to meet its day ahead and real-time power needs. These transactions may be from unspecified resource purchases, which could include coal-fired resources; however, per the definition of coal-fired resource in RCW 19.405.020, these transactions are exempt from the requirement because they are a limited duration wholesale power purchase that does not exceed one month. The District will ensure any longer duration wholesale power purchase transactions do not include coal-fired resources by either having these transactions originate from a specified generating source or develop another means within the rules of the statute to determine that the source of the energy purchased is not generated from a coal-fired resource.</p>	<p>To the extent the District needs to continue to make market purchases, the District expects to continue with the same action plan as described by the 2020 IRP, including complying with the no coal attestation requirements of Washington Administrative Code (WAC) 194-40-300.</p>														
2	<p>RCW 19.405.040 – Greenhouse gas neutral by 1/1/2030 (first compliance period 2030-2033)</p> <p>a. The District will continue to monitor the CETA rulemaking process for this section and develop a plan to comply with those rules once adopted.</p> <p>b. Assuming the District’s BPA contract renewal in 2028 is similarly structured as its existing BPA contract, the District will have sufficient electricity from renewable resources and non-emitting electric generation to meet, and exceed, the 80% portion of the requirement.</p> <p>c. The District will procure RECs to address the remaining need to comply with the 20% portion of the requirement, which will also satisfy its Energy Independence Act (RPS) renewable requirement per RCW 19.285.040.</p> <p>d. Future evaluations of the District’s energy/capacity needs and associated potential resource acquisition in future integrated resource plans will consider this requirement.</p>	<p>The District expects to continue with the same action plan as described by the 2020 IRP. Furthermore, in November 2021, the District approved its “2022 Clean Energy Implementation Plan” (CEIP), outlining the District’s plan for meeting the 2030 and 2045 clean energy requirements for the interim period from 2022-2025. The District held two public meetings—on July 27, 2021 and August 24, 2021—to provide an overview of the CEIP requirements and to solicit community input. As required by CETA, the CEIP was informed by the 2020 IRP’s CEAP and was consistent with the 2020 IRP’s resource adequacy requirements. The final CEIP was adopted by Commission Resolution No. 2585 on November 9, 2021 and is available on the District’s Resource Planning website (see footnote 1). The CEIP identified specific targets for energy efficiency, demand response and renewable energy targets and actions to support an equitable transition to the state’s clean energy goals, as summarized by the table below—from the Nov. 2021 Commission presentation:</p>														
3	<p>RCW 19.405.050 – 100% carbon free by 1/1/2045</p> <p>a. Continue to monitor carbon free resource development and new technology (energy storage, small modular reactors (SMR), etc.) that may assist in meeting this requirement. Meeting the District’s capacity needs with renewable resources and non-emitting generation is anticipated to be challenging during peak winter and summer events with existing technology; however, the District will assess the need to contract for a baseload non-emitting resource, such as SMRs, in excess of its energy needs in order to meet its capacity needs.</p> <p>b. The District plans to explore developing a demand response potential assessment to better understand what cost-effective demand response could be deployed in our service territory that would contribute toward meeting our peak capacity needs.</p> <p>c. Future evaluations of the District’s energy/capacity needs and associated potential resource acquisition in future integrated resource plans will consider this requirement.</p>	<table border="1"> <thead> <tr> <th data-bbox="1121 1084 1346 1125">Requirement</th> <th data-bbox="1373 1084 1955 1125">Status/Target/Indicator</th> </tr> </thead> <tbody> <tr> <td data-bbox="1121 1125 1346 1198">2030 – GHG Neutral</td> <td data-bbox="1373 1125 1955 1198">All retail sales of electricity must be 100% Greenhouse Gas (GHG) Neutral for each multi-year compliance period – Forecast to be greater than 100% for the interim period</td> </tr> <tr> <td data-bbox="1121 1198 1346 1255">2045 – Carbon Free</td> <td data-bbox="1373 1198 1955 1255">All retail sales must be supplied by 100% from renewable/non-emitting resources – Forecast to be less than 100% by 2045</td> </tr> <tr> <td data-bbox="1121 1255 1346 1304">Energy Efficiency</td> <td data-bbox="1373 1255 1955 1304">2022-2025 Target – 31,448 MWh (3.59 aMW)</td> </tr> <tr> <td data-bbox="1121 1304 1346 1344">Demand Response</td> <td data-bbox="1373 1304 1955 1344">2022-2025 Target – 0 MW</td> </tr> <tr> <td data-bbox="1121 1344 1346 1393">Renewable Energy</td> <td data-bbox="1373 1344 1955 1393">2022-2025 Target – 6,849,892 MWh (195.4 aMW)</td> </tr> <tr> <td data-bbox="1121 1393 1346 1498">Equitable Transition</td> <td data-bbox="1373 1393 1955 1498">2022-2025 Equity Area – Energy Burden Indicators: <ul style="list-style-type: none"> • Total # energy burdened customers assisted • Total \$ toward energy burdened customers </td> </tr> </tbody> </table>	Requirement	Status/Target/Indicator	2030 – GHG Neutral	All retail sales of electricity must be 100% Greenhouse Gas (GHG) Neutral for each multi-year compliance period – Forecast to be greater than 100% for the interim period	2045 – Carbon Free	All retail sales must be supplied by 100% from renewable/non-emitting resources – Forecast to be less than 100% by 2045	Energy Efficiency	2022-2025 Target – 31,448 MWh (3.59 aMW)	Demand Response	2022-2025 Target – 0 MW	Renewable Energy	2022-2025 Target – 6,849,892 MWh (195.4 aMW)	Equitable Transition	2022-2025 Equity Area – Energy Burden Indicators: <ul style="list-style-type: none"> • Total # energy burdened customers assisted • Total \$ toward energy burdened customers
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Appendix A: Price Forecasts

Natural Gas Price Forecast

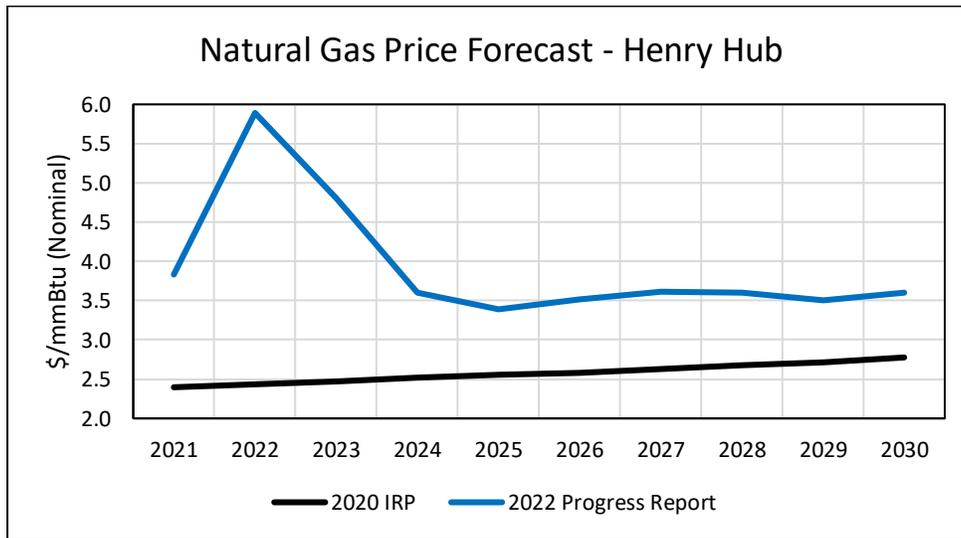
Commodity costs, supply chain issues, and the rate of inflation all have risen considerably since the 2020 IRP study was developed. The price forecast for natural gas is a key planning component as dispatchable natural gas-fired internal combustion engines and combustion turbines in simple and combined cycle configurations are competing in the near term with variable output renewable resources such as wind and solar for inclusion in utility resource plans. The natural gas forecast is a key input to the development of a market price forecast.

In the 2020 IRP, the January 21, 2020 NYMEX natural gas curve was the basis for future natural gas prices (black line in the graph below). As of April 25, 2022 when this Progress Report was being developed, NYMEX pricing for natural gas had increased over \$4.50/MMBtu for the May 2022 through March 2023 period, and an average of \$1.71/MMBtu for the April 2023 through December 2030 period.



Natural gas price forecasts developed by S&P Global Platts and Wood Mackenzie are based on supply and demand balances resulting from the analysis of market fundamentals. Both entities expect that natural gas prices will decline during the 2023 through 2025 period. The price forecast below (blue curve) is based on these recent forecasts and was used as an input to the Aurora market price forecast for the 2022 Progress Report. The updated curve for 2022 is nearly

\$3.50/MMBtu higher than the 2020 IRP assumption. The difference narrows to an average of approximately \$0.90/MMBtu between the years of 2024 and 2030.



Power Market Price Forecast

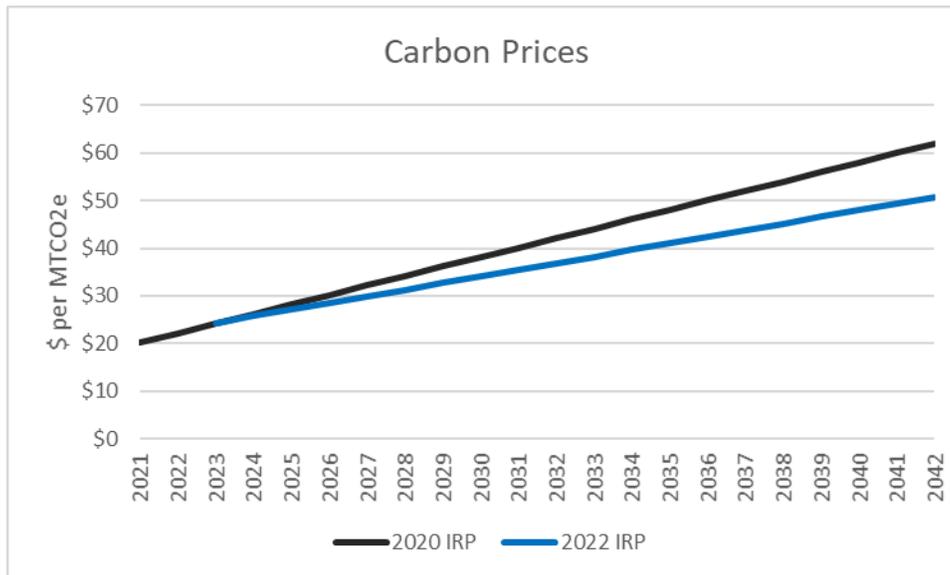
An updated electricity price simulation was conducted for this Progress Report, using the same tool —Energy Exemplar’s Aurora forecasting software — to simulate the supply and demand fundamentals of the physical power market to produce a long-term power price forecast. Using factors such as the economic and performance characteristics of supply resources, regional demand, and zonal transmission constraints, Aurora simulates the WECC system to determine an adequate generation portfolio, constrained by the limitations of the transmission network, that work together to serve load. The model simulates resource dispatch which is used to create long-term price and capacity expansion forecasts.

The main changes in assumptions for model inputs for the 2022 Progress Report are primarily twofold: higher natural gas prices described above and the implementation of carbon pricing in Washington State for the Production Cost Model Aurora run. For the 2020 IRP, the social cost of carbon was already applied during the Capacity Expansion Aurora run to develop a new resource stack, as required by 2019’s Clean Energy Transformation Act (CETA). One provision of this new law requires utilities to consider the social cost of carbon in resource planning, evaluation, and selection. The values provided by the Washington State Department of Commerce for the social cost of carbon are summarized in the figure below. The new resource stack from the Capacity Expansion run was then fed into a Long-Term Production Cost Model run with the social cost of carbon removed, since the social cost of carbon will not affect dispatch decisions in real life.

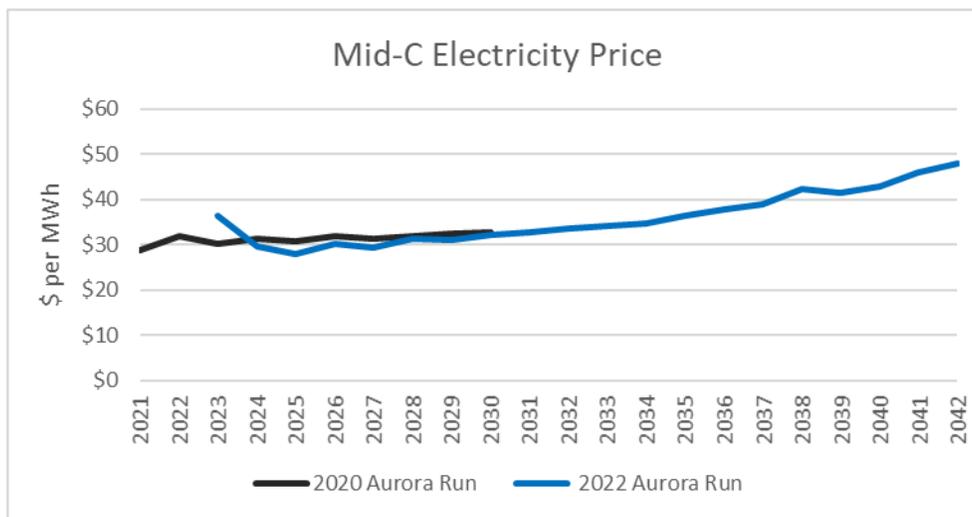
Year in Which Emissions Occur or Are Avoided	Social Cost of Carbon Dioxide (in 2007 dollars per metric ton)	Social Cost of Carbon Dioxide (in 2018 dollars per metric ton)
2020	\$62	\$74
2025	\$68	\$81
2030	\$73	\$87
2035	\$78	\$93
2040	\$84	\$100
2045	\$89	\$106
2050	\$95	\$113

With the passage of the Climate Commitment Act (CCA) in 2021 in Washington State, however, there is now a carbon market coming to Washington State starting in 2023. Although much is still unknown regarding how the CCA will operate, including pricing, the 2022 price forecast assumed carbon prices in Washington would approximate California carbon prices. Current thinking is that at some future period there may be linkage between the Washington, Oregon,

and California programs, therefore, the carbon price assumptions are based on a linear regression of the California quarterly auction settles since the start of the program nearly a decade ago. The carbon price assumptions used in the 2020 and 2022 IRP market price forecast are summarized in the chart below.



The 2020 IRP market price forecast was for the 2021 through 2030 period. The market price forecast for the 2022 Progress Report, shown below, is for the 2022 through 2044 period. Forecast results are comparable with the largest difference stemming from notably higher natural gas prices in the 2022 forecast. Recent (February 2022) higher natural gas prices have had a direct impact on the market price forecast results for the first year of the 2022 Progress study period (2023). Prices then stabilize and remain within a couple of dollars for the rest of the mutual years of the study periods (2024 through 2030).



The relatively minor change in the market price forecast since 2020 can be largely explained by the fact that hydrogeneration remains the dominant resource in the Pacific Northwest, and with renewable buildout similar in the two market price forecast studies, hydro is often the marginal unit. The higher gas prices, therefore, do not have as much of an impact on the overall energy price stream. Keep in mind, the Aurora market price forecast is the result of a long-term capacity expansion model based upon market fundamental assumptions. As such it does not consider the risk of extreme capacity events, nor does it apply a risk premium or energy price forecast volatility over the study period the way the actual forward curve does.