

2020 Integrated Resource Plan



TACOMA POWER
TACOMA PUBLIC UTILITIES

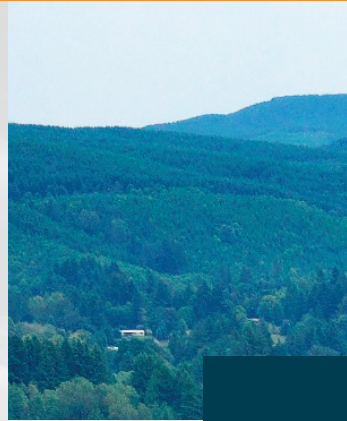


TABLE OF CONTENTS

1 INTRODUCTION	5
2 ABOUT OUR INTEGRATED RESOURCE PLAN	11
3 NEW SINCE OUR 2017 IRP	12
CLEAN ENERGY TRANSFORMATION ACT	12
EV AUTHORITY	12
THE ENERGY IMBALANCE MARKET	12
IMPACTS OF THE COVID-19 PANDEMIC	13
FOCUS ON EQUITY AND INCLUSION	13
4 ANALYSIS	14
HOW WE ANALYZE OUR PORTFOLIOS	14
PORTFOLIOS WE CONSIDER	15
RESULTS	16
5 OUR RESOURCE STRATEGY AND ACTION PLAN	18
RESOURCE STRATEGY	18
ACTION PLAN	18
MORE INFORMATION ABOUT THE IRP	19







1 INTRODUCTION

Tacoma Power has been publicly-owned since 1893. We are a division of Tacoma Public Utilities, which is governed by a five-member Public Utility Board. We were established in 1893 when the citizens of Tacoma voted to buy the privately-owned Tacoma Light & Water Company. Local citizens believed that public ownership and local control would give them a higher caliber of services and the ability to maintain control over them. That decision paved the way for us to become a national leader in providing renewable, reliable, and affordable electricity.

Today, we generate, transmit, and distribute electricity and provide energy services in an increasingly competitive marketplace. We provide electricity to nearly 179,000 homes and businesses across 180 square miles in the cities of Tacoma, Fircrest, University Place, Fife, parts of Steilacoom, Lakewood, Joint Base Lewis-McChord, and unincorporated Pierce County as far south as Roy.



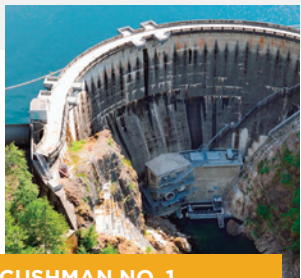
WHERE YOUR POWER COMES FROM

Nearly all of the electricity we deliver to our customers comes from hydroelectric power sources. We produce a little less than half of it at four hydroelectric projects that we own and operate: the Cowlitz River Project, Cushman Hydroelectric Project, Nisqually River Project, and Wynoochee River Project. We contract with other predominantly hydro projects for the remainder.

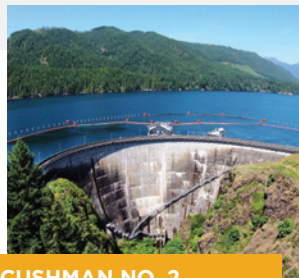


Our resources usually provide more electricity than we need to serve our retail customers. When we have surplus electricity, we sell it on the wholesale market.

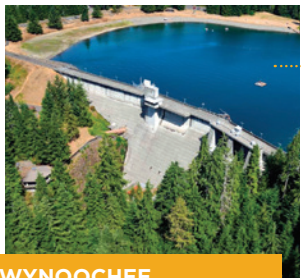
The revenue from these sales helps us maintain electric rates among the lowest in Washington State and the nation.



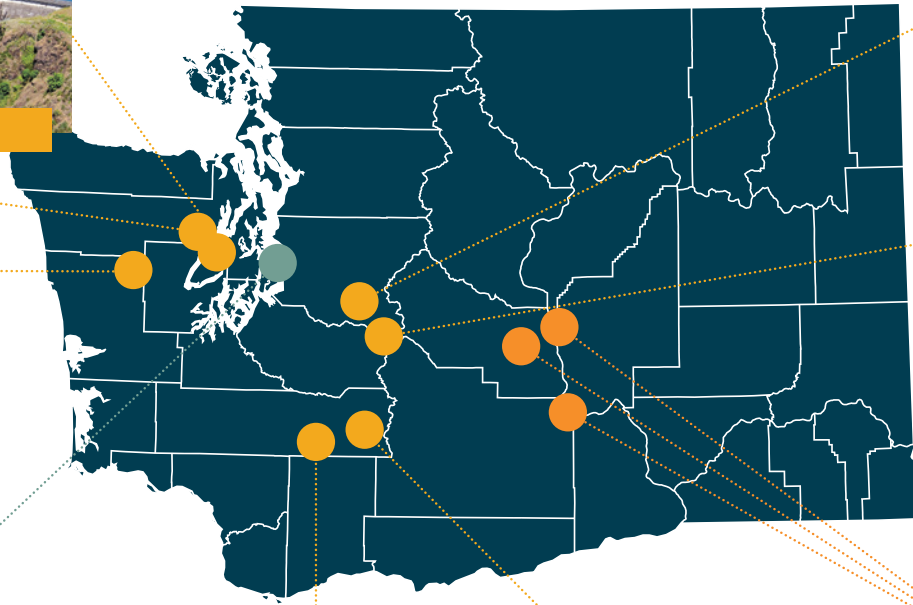
CUSHMAN NO. 1



CUSHMAN NO. 2



WYNOOCHEE



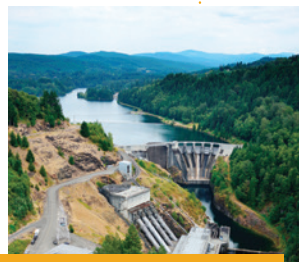
LA GRANDE



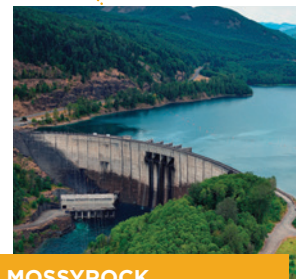
ALDER



CONSERVATION



MAYFIELD



MOSSYROCK



OUR HYDRO PROJECTS

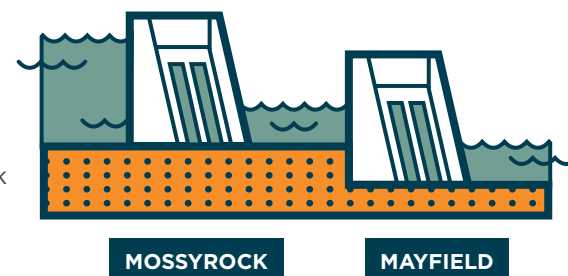
COWLITZ RIVER PROJECT

Lewis County, WA

The Cowlitz River Project is our largest hydro project and comprises two dams. Built in 1963, Mayfield Dam forms the 13-mile-long Mayfield Lake. Mossyrock Dam, built in 1968, is the tallest dam in Washington State at 606 feet above bedrock and forms the 23.5-mile-long Riffe Lake.

Fast Facts

- Total generating capacity = 555MW
- Serves equivalent of 151,200 NW homes
- Significant storage and flexibility at Mossyrock
- Continuous outflow at Mayfield
- Current license period is 2003 through 2038



CUSHMAN HYDROELECTRIC PROJECT

Mason County, WA

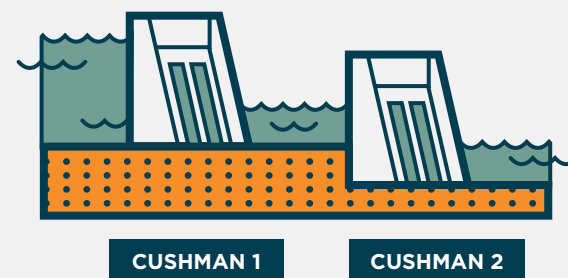
Energized in 1926, Cushman No. 1 Dam is one of the first major dams in the Pacific Northwest. The dam creates Lake Cushman.

Cushman No. 2 Dam is just downstream and was completed in 1930. It forms the 150-acre Kokanee Lake. Its powerhouse sits several miles below the dam, overlooking Hood Canal along U.S. Highway 101.

Electricity moves from the Cushman Hydroelectric Project to Tacoma on a 40-mile-long transmission line that spans more than a mile and a quarter between towers in Tacoma and Gig Harbor.

Fast Facts

- Total generating capacity = 134.6MW
- Serves equivalent of 30,200 NW homes
- Flexible when there are sufficient flows
- Current license period is 2010 through 2048



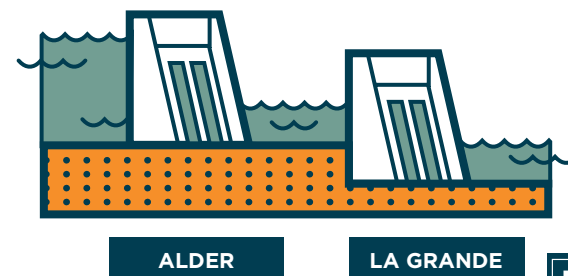
NISQUALLY RIVER PROJECT

Pierce County, WA

Today, the Nisqually River Project is our second-largest hydro project. We began generating hydroelectricity from the Nisqually River in 1912. At that time, we used the diversion dam to direct water to a powerhouse. That changed in 1945 when we replaced it with two much larger concrete structures: Alder Dam and LaGrande Dam. Alder Lake is the 3,000-acre reservoir formed by Alder Dam.

Fast Facts

- Total generating capacity = 115.6MW
- Serves equivalent of 45,600 NW homes
- Flexible when there are sufficient flows
- Current license period is 1997 through 2037



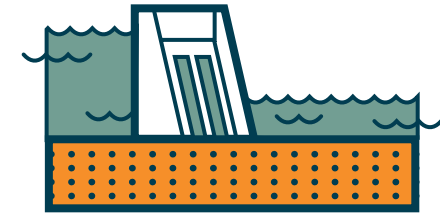
WYNOOCHEE RIVER PROJECT

Grays Harbor County, WA

Completed in 1972, the City of Aberdeen owns the Wynoochee Dam. It was built by the U.S. Army Corps of Engineers to provide flood control, irrigation, and industrial water storage for Aberdeen. The dam is located in the foothills of the Olympic Mountains in Grays Harbor County and forms Wynoochee Lake. We created the Wynoochee River Project in 1994 after building a powerhouse a quarter-mile downstream from the Wynoochee Dam.

Fast Facts

- Total generating capacity = 12.8MW
- Serves equivalent of 2,500 NW homes
- Run-of-river operations
- Current license period is 1987 through 2037



WYNOOCHEE



THE BENEFITS OF HYDROPOWER

Hydropower is a renewable, flexible, secure, and affordable source of power.



Renewable

Each year, rain and snow replenish our supply of hydropower. Hydropower produces no emissions or waste products and is the largest source of clean power in the United States.



Flexible

By changing the amount of water flowing through dams, hydropower facilities can instantly adjust how much power they produce. This flexibility makes hydropower particularly good at meeting rapid-changing demands for electricity throughout the day, which supports the integration of other renewable resources with less predictable output, like wind and solar.



Secure

Our water supply is not vulnerable to foreign supply disruptions, international political crises, transportation outages, or unpredictable changes in fuel costs.



Affordable

Hydropower's operating costs are low because the fuel that powers our dams—water—is free. As a result, customers in states like Idaho, Washington, and Oregon that get most of their electricity from hydropower benefit from lower energy bills than the rest of the United States.

HYDRO POWER CONTRACTS

BONNEVILLE POWER ADMINISTRATION

Most of the power we buy is from the Bonneville Power Administration (BPA). We rely on BPA for about half of our power supply in an average year. BPA sells its power from federally-owned hydro projects in the Columbia River Basin, several renewable projects in the Pacific Northwest, and the Columbia Generating Station, our region's sole nuclear power plant. The Northwest Power Act requires BPA to provide power to each publicly owned utility that requests BPA power to meet its power needs. Each utility's power need is calculated as the difference between its customers' demand for power and its existing supply of power from other generating resources. We have been a BPA customer since 1940, and as a municipal utility, we are one of its "preference customers."



We rely on BPA for about half of our power supply in an average year.

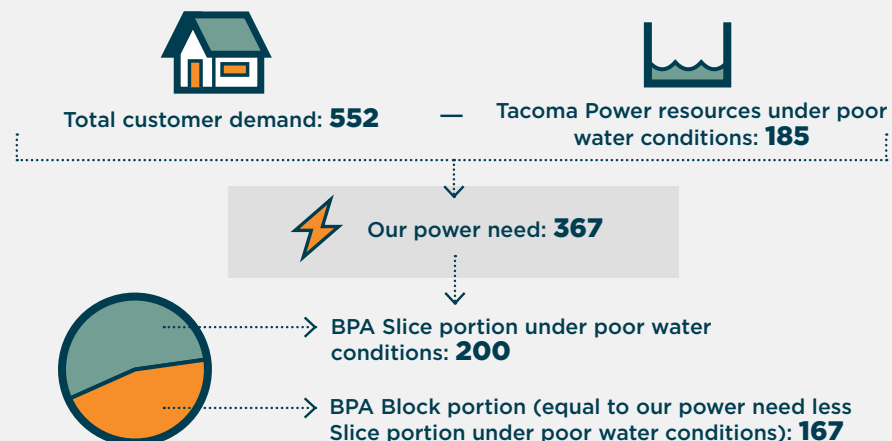
We receive energy from BPA through a hybrid Slice/Block product. Under the "Slice" portion of our contract, we receive approximately 3% of the power BPA produces, an amount that varies by year and season depending on streamflow conditions. Under the "Block" portion of our contract, BPA guarantees us a certain amount of energy every month that does not change with streamflow conditions.

Our current contract with BPA ends on September 30, 2028. Our 2020 IRP asks the following three questions regarding the renewal of our BPA contract in 2028:

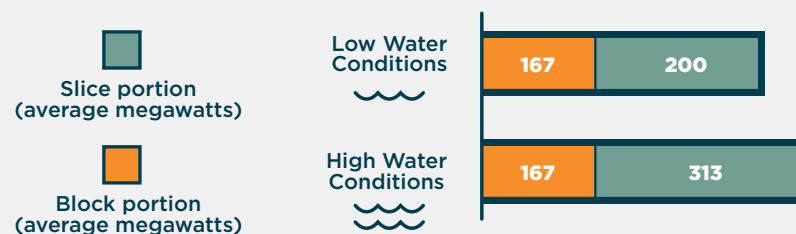
1. Should we renew our contract with BPA in 2028?
2. If we renew our contract with BPA, which BPA product looks most promising?
3. If we renew our contract with BPA, is there value in diversifying our portfolio by replacing part of our BPA contract with another source of non-emitting generation, like wind or solar?

Our next few IRPs will continue to evaluate these questions as 2028 approaches.

EXAMPLE OF HOW BPA CALCULATES OUR POWER NEED



ANNUAL ENERGY WE RECEIVE FROM THE BPA SLICE/BLOCK PRODUCT VARIES EACH YEAR BASED ON WATER CONDITIONS



COLUMBIA BASIN HYDRO

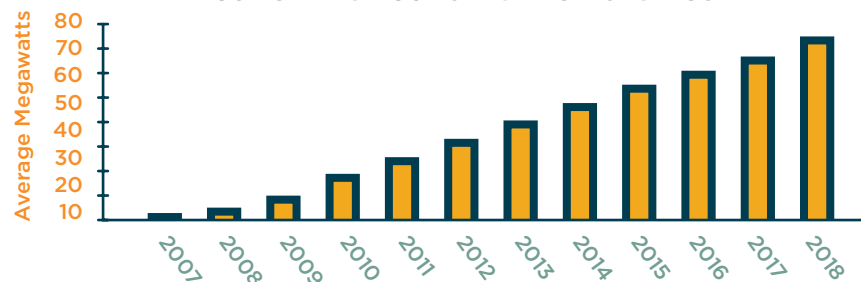
We receive a small share of our power (roughly 3% of our generation in an average year) from Columbia Basin Hydropower (CBH) through contracts for 50% of the output from five hydro projects on irrigation canals. The supply is limited to the irrigation season (mainly summer months). Our contracts begin to expire in 2022 and terminate in 2027 completely. Because our contracts start to expire in the near future, a key question we consider for our current IRP is whether we should renew our contracts with CBH or let them expire.











CONSERVATION

For years, energy conservation has been the only resource we acquire, and we continue to help our customers reduce energy use, which assists us with avoiding the need to invest in costly generation facilities. We consistently meet or exceed our energy conservation goals. Thanks to our and your investments in energy conservation since 2007, each year we save the same amount of power as we generate annually at Mayfield Dam.

CUMULATIVE CONSERVATION SAVINGS



CONSERVATION PROGRESS

Year	2012-2013	2014-2015	2016-2017	2018-2019
Average Megawatt Goal	 11.27	 8.10	 9.54	 9.99
Average Megawatt Achieved	 15.37	 14.60	 11.47	 13.98

TRANSMISSION RESOURCES

We use a combination of transmission lines we own and transmission we purchase from other providers to transport power from our generating resources to our local distribution system. Like most utilities in the Pacific Northwest, we rely heavily on BPA for transmission services. Because building transmission lines is very costly and can take decades, we do not consider construction of new transmission lines in our 2020 IRP.



LEDs now make up 92% of Tacoma's streetlights.

PROJECT HIGHLIGHT: LED STREETLIGHT REPLACEMENT PROJECT

Tacoma's streetlight replacement project is an example of how effective collaboration and sharing of duties between our utility and the City of Tacoma Department of Public Works enabled us to complete this energy conservation project three months early and almost \$2,000,000 under budget.

The City's Environmental Action Plan recommended upgrading 21,000 of Tacoma's inefficient HID streetlight fixtures that had been in service long past their useful life, to new LEDs. Meanwhile, Public Works faced a backlog of maintenance issues and delays in servicing existing streetlights due to staffing constraints. Limits to General Government's budget also made group fixture replacement impossible.

To help manage electricity costs, the City sought help from Tacoma Power for a solution. We created a new rate for LED streetlight service to recover

the project's capital and electricity costs by combining the expense of the LED fixtures with their energy use. The rate enabled us to fund and replace 15,400 HID fixtures with LEDs, and Public Works to replace 2,800 HID fixtures with LEDs through our Bright Rebates program. The City will save approximately 11,869,024 kWh of electricity. That amount equals the electricity use of almost 1,000 average homes.

The City will cut its lighting load by approximately 71%, reducing its electricity costs by almost \$560,000 each year. In addition to saving the City money through energy conservation and reducing maintenance costs, citizens and visitors in Tacoma have better quality and more consistent light levels that improve nighttime safety.

DEFINITION

Transmission

Transmission carries power from a generating source to a local power distribution system. Transmission power lines are typically taller, higher voltage lines than the ones used to distribute power to your home or business.





We work to ensure that IRP stakeholder group participants represent various segments of our customers, local and regional environmental groups, and organizations committed to economic justice.

2 ABOUT OUR INTEGRATED RESOURCE PLAN

Our Integrated Resource Plan (IRP) is a tool that helps us plan for an uncertain future so we can continue to provide reliable, low-cost power to our customers for decades. In each IRP, we look out over the next 20 years. We use sophisticated modeling tools and a great deal of analysis to help us understand how a potential decision about an energy resource might impact our customers, and our utility, under a broad range of future conditions. We create a new IRP every four years because our projections of what the future might hold evolve. We also revisit and make small updates to the plan in the interim every two years.

COMMUNITY INPUT

Input from the communities we serve is an integral part of developing each IRP. Each time we develop an IRP, we hold a series of stakeholder workshops. The workshops are open to the public, and we post meeting materials (including a video recording of each workshop) on our IRP webpage. We held most of our 2020 workshops virtually due to COVID-19. We advertise workshops in advance through a variety of channels (website, social media, email to interested parties, etc.). We work to ensure that participants represent various segments of our customers, local and regional environmental groups, and organizations committed to economic justice.

We address and consider the feedback provided by our stakeholders. When we can, we incorporate suggestions into our modeling immediately. During our 2020 workshops, for example, several stakeholders suggested we consider demand response in some of our potential resource plans. Based on their feedback, we developed a simple demand response product to include in our analysis, and it is included in our final resource strategy. We will also continue to investigate more complex forms of demand response in our Action Plan, which we discuss later in this document. We save some other suggestions for consideration in future IRPs due to time constraints.





3 NEW SINCE OUR 2017 IRP

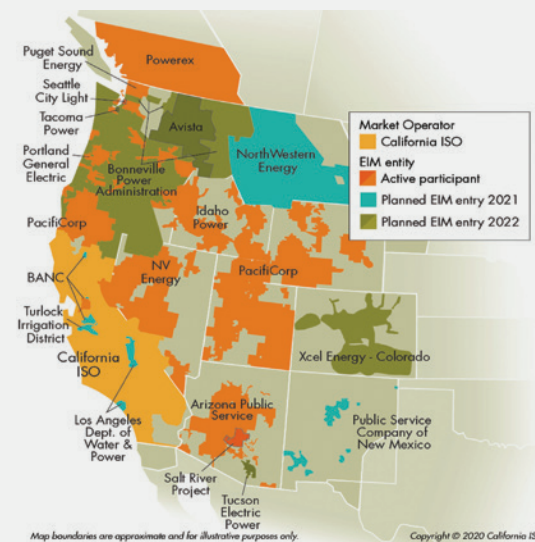
CLEAN ENERGY TRANSFORMATION ACT

On May 7, 2019, Governor Jay Inslee signed into law the Clean Energy Transformation Act (CETA) (E2SSB 5116, 2019), which commits the State of Washington to an electricity supply free of greenhouse gas emissions by 2045. The landmark law imposes new clean energy mandates on electric utilities in Washington as well as planning and reporting requirements. Stakeholders and state government officials from the departments of Commerce, Ecology, Health, and the Washington Utilities and Transportation Commission are working together to establish the rules to implement CETA. The rulemaking process is scheduled for completion by mid to late 2022. As a result, we did our best to comply with the spirit of the law in our 2020 IRP, but it may not reflect all CETA requirements.

EV AUTHORITY

SB 1512 was passed into law by the 2019 Washington State Legislature, and the bill is codified as RCW 35.92.450. The law provides that customer-owned utilities can create their own Transportation Electrification Plan (i.e., electric transportation plan) and, with adoption by their governing body, promote electric vehicles through programs, advertising, and direct incentives. The law strikes a balance by allowing utilities to promote electric vehicle adoption but seeks to uphold traditional utility principles that protect customers from program-related spending that could lead to significant rate increases.

On July 22, 2020, the Tacoma Public Utilities Board voted to adopt our first Transportation Electrification Plan, which establishes guiding principles for designing and delivering programs to support electric vehicle adoption. We also developed our first Transportation Electrification Action Report in 2020 and will update it annually.



THE ENERGY IMBALANCE MARKET

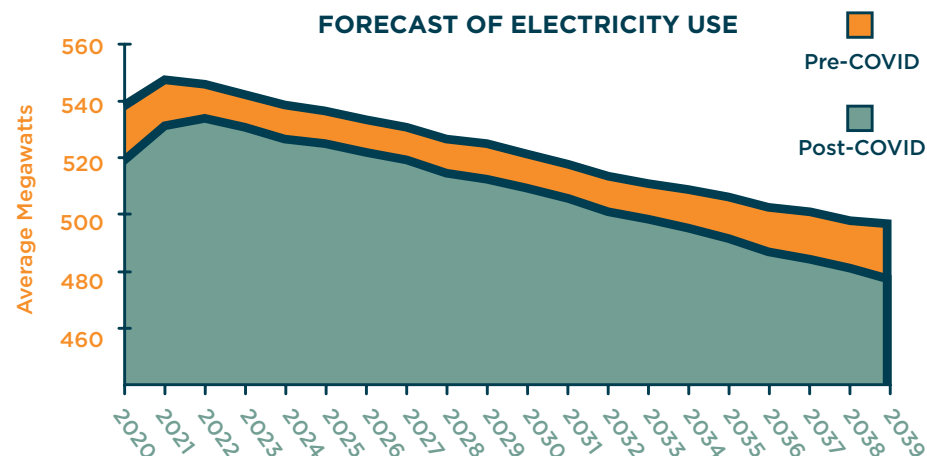
The Western Energy Imbalance Market (EIM), which is operated by the California Independent System Operator (CAISO), provides participating utilities the ability to improve their balance of supply and demand for energy within time intervals as short as five and fifteen-minutes. Prior to the development of the EIM in the Northwest, real-time energy was only bought and sold between two entities, with most transactions lasting for one hour. Within the markets that CAISO operates, however, real-time trading occurs through a centralized and automated market that optimizes the bids for buying and selling of all market participants. Coordination improves reliability and reduces system costs.

To expand the capabilities of its system, in 2014 the CAISO began expanding the EIM outside of California in partnership with PacifiCorp. It has since grown to include 11 organizations, with nine more committed to joining by 2022, including BPA and Tacoma Power. The process of our EIM implementation is fully underway, with a targeted “go live” date of March 2022.



IMPACTS OF THE COVID-19 PANDEMIC

We finalized the assumptions for our 2020 IRP modeling before the onset of the COVID-19 pandemic and do not directly take its impacts into account in our modeling. As commercial activity shut down locally, commercial customers' demand for electricity dropped. The relatively small uptick in residential usage was not enough to replace that loss. Economists expect national economic recovery might be slow, uneven, and fragile and that some industries might not recover for years. As a result, we revised our long-term forecast of electricity consumption to account for the on-going pandemic and economic downturn. The revised forecast is between 2.0% and 5.0% below our October 2019 forecast that we used in the IRP. While we do not include the updated forecast in our analysis, we do consider a range of forecasts in our modeling, including one where the demand for electricity goes down over time.



FOCUS ON EQUITY AND INCLUSION

We recognize that the historical legacies and current manifestations of systemic racism and other forms of oppression create disparities in our communities and service areas. While overtly racist laws and practices such as redlining are no longer in use, our communities and service areas are still impacted by them. As a public entity, it is important that we incorporate racial and other equity into our work so that we do not unintentionally perpetuate these disparities.

To that end, the Tacoma City Council unanimously adopted the City's Equity and Empowerment framework in 2014. In August 2019, the Tacoma Public Utility Board adopted Strategic Directive #1 pertaining to equity and inclusion. More recently, the Tacoma City Council adopted Resolution Number 40622, outlining a commitment to anti-racist system transformation.

In addition to our internal commitments as an organization, there is also language in CETA that requires utilities to consider equity in resource planning. According



As a public entity, it is important that we incorporate racial and other equity into our work so that we do not unintentionally perpetuate these disparities.

to CETA, utilities must ensure that all customers benefit from the transition to clean energy through the equitable distribution of energy and non-energy benefits, and the reduction of burden to vulnerable populations and highly impacted communities.

There are two areas where our IRP can address equity and inclusion:

- 1. During public stakeholder outreach.** When we conduct outreach to our stakeholders, we are intentional in organizing a diverse group of stakeholders for their feedback. We will continue to improve our inclusivity in our outreach in the future.
- 2. In our IRP analysis.** Incorporating equity into our IRP analysis calls for quantitative metrics. As part of CETA rulemaking, the Washington State Department of Health leads a workgroup that is developing a cumulative impact analysis framework that will serve as the basis for utilities to incorporate equity considerations into their planning. That process was not complete before filing our 2020 IRP. Our resource planning team participates in all public meetings relating to the development of those equity metrics and will incorporate equity metrics into our IRPs in the future.





4 ANALYSIS

We consider many different power generating technologies and demand-side resources like energy conservation and demand response to meet our needs in the future. We combine them into portfolios, run each portfolio through our models, and compare their performance based on a set of performance criteria.

HOW WE ANALYZE OUR PORTFOLIOS

We assess our portfolios using several metrics. While the metrics evolve, we always include two fundamental criteria:

1. That our portfolios leave us with enough resources to meet customer needs (resource adequacy) and,
2. That our costs are as low as possible given our other constraints and priorities.

In our 2020 IRP, we assess our portfolios based on five metrics (see page 16 for more details):

- i. compliance with Washington's CETA,
- ii. resource adequacy,
- iii. expected portfolio cost,
- iv. financial risk; and
- v. carbon emissions.

We treat the first two criteria (resource adequacy and CETA compliance) as hard constraints, meaning that portfolios must meet these criteria to be viable. Our 2020 IRP metrics are consistent with our Public Utility Board's Strategic Directives.

A CONNECTION TO THE STRATEGIC DIRECTIVES OF THE PUBLIC UTILITY BOARD

The metrics we use to evaluate portfolios are tied closely to the Public Utility Board's strategic directives (SD) below.



Equity and Inclusion (SD1)

- Portfolio cost (keep rates low for financially disadvantaged customers)
- Equity metric to be developed for our next IRP



Financial Sustainability (SD2) and Rates (SD3)

- Portfolio cost
- Financial risk



Environmental Leadership (SD5) and Decarbonization (SD11)

- CETA compliance
- Portfolio carbon emissions



Reliability and Resiliency (SD7)

- Resource adequacy

The strategic directives below are not tied to the metrics we use to evaluate portfolios, but they guide our process.



Stakeholder Engagement (SD4)

- Stakeholder input sought in portfolio selection
- Metrics of engagement to be developed to gauge success of public process



Innovation (SD6)

- May be considered qualitatively in future IRPs



Resource Planning (SD14)

- We conduct our IRP according to the values described in the Resource Planning directive

PORTFOLIOS WE CONSIDER

We evaluate 23 portfolios that include different combinations of products from BPA, CBH, wind, solar, additional hydropower at our facilities, pumped storage, natural gas, nuclear power, and demand response. Of the 23 portfolios we evaluate, 22 include only carbon-free resources. All of the portfolios include our current hydro projects and energy conservation. View some examples of the portfolios we evaluate below.

EXAMPLES OF PORTFOLIOS WE CONSIDER

 Slice/Block Portfolio	 Shapeable Block Portfolio
 Reduced Slice/Block with Eastern Washington Wind Portfolio	 Reduce Block with Eastern Washington Wind Portfolio
 Slice/Block + 80MW Eastern Washington Wind Portfolio	 Slice/Block + Columbia Basin Hydro (CBH) Portfolio
 Slice/Block + 10MW Demand Response Portfolio	 Wind + Pumped Storage Hydro (PSH) + Demand Response (no BPA) Portfolio

 Conservation

 Demand Response

 Eastern Washington Wind

 Eastern Washington Wind (partially replaces BPA)

 Gorge Wind

 Montana Wind

 PSH at the Cowlitz River Project

 Renew CBH

 Shapeable Block

 Slice/Block

 Tacoma Power Hydro

DEFINITIONS

Demand Response

Demand response is a change or shift in the timing of customer energy consumption. Customers choose to consume less energy at times when our power supply is tight or wholesale power prices are high and more at times when supply is plentiful and wholesale prices are low. Examples can include thermostats or water heaters that are programmed to shift energy use to certain times. It can also be industrial customers scheduling their production processes around certain times of the day. Because demand response is beneficial to the utility and helps keep rates low, customers receive compensation for participating. Demand response is a demand-side resource, meaning that we invest in altering customer consumption rather than investing in additional generating technologies.



Conservation

Energy conservation is also a demand-side resource. Conservation and energy efficiency are defined differently by different people and are sometimes used interchangeably. For us, conservation means reducing energy consumption through the use of more efficient technologies or practices that provide the same amount of heat, light, work etc. It does not include reducing energy use in ways that compromise productivity or comfort.



BPA Slice/Block Product

We currently receive energy from BPA through a hybrid Slice/Block product. Under the "Slice" portion of our contract, we receive approximately 3% of the power that BPA produces, which varies with streamflow conditions. Under the "Block" portion of our contract, we are guaranteed a certain amount of energy every month that does not change with streamflow conditions.



BPA Shapeable Block Product

This Block-only product from BPA guarantees us a specific amount of energy each month, with some flexibility to determine when we receive that energy across certain hours of the day.



Pumped Storage Hydro (PSH)

PSH is a type of hydroelectric energy storage. When water is plentiful, it is pumped from a lower reservoir to an upper reservoir, where it is stored. Water is released from the upper reservoir and run through turbines to generate power when it is needed.



Portfolio

A portfolio is a specific combination of power generation resources and demand-side resources. The combination of resources is used to serve customers' power needs.



RESULTS

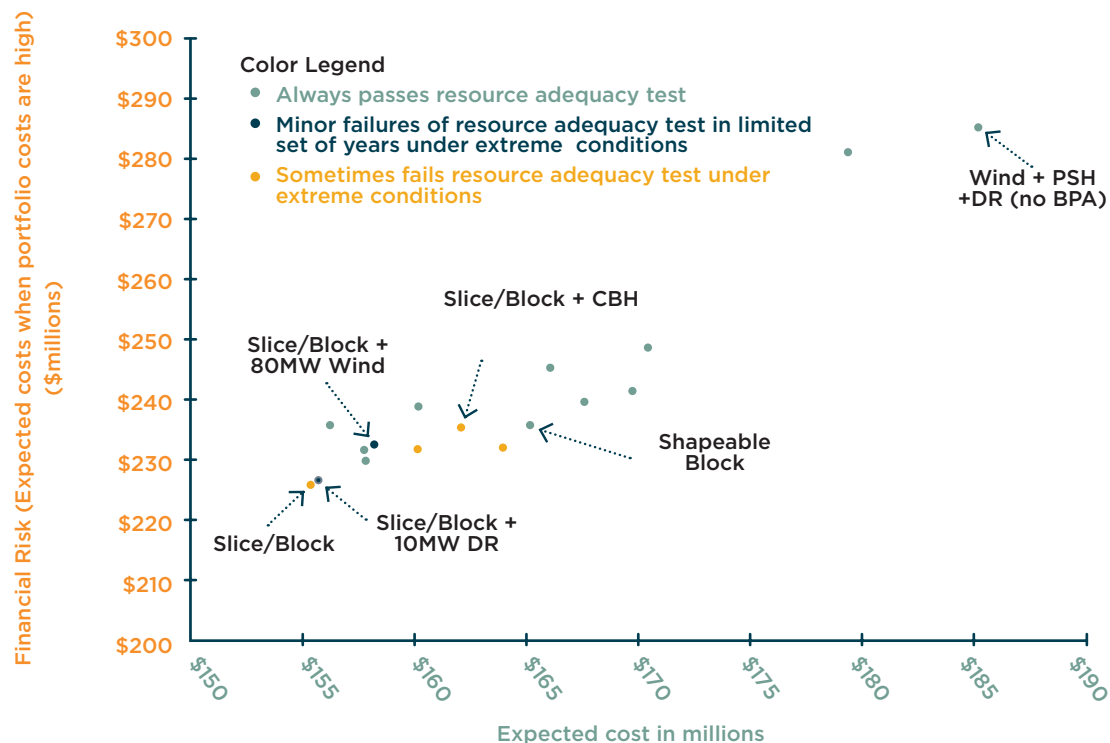
CETA COMPLIANCE:

Any portfolio we consider must meet the requirement that we serve at least 80% of our load by carbon-free power by 2030. All of the portfolios we analyze in our 2020 IRP comply with this requirement. CETA will eventually require that we serve 100% of our load by carbon-free power by 2045. We will begin to address post-2024 compliance after CETA rulemaking concludes.

RESOURCE ADEQUACY

Resource adequacy means having enough power resources available to serve electricity demands across a range of conditions. We evaluate each potential portfolio based on three resource adequacy metrics that measure the magnitude, duration, and frequency of potential shortfall events. We eliminate portfolios from consideration if they do not meet a certain threshold for each metric. Out of the 23 portfolios we consider, 17 pass our resource adequacy tests, though some still present minor resource adequacy concerns under extreme low water conditions. Generally, our analysis finds it is difficult to replace our BPA contract with other sources of renewable power like wind and solar. Portfolios that include the renewal of our BPA contract with the Shapeable Block product are always adequate whenever we renew them at current resource levels. Portfolios that include the renewal of our BPA contract with the current Slice/Block product result in some occasional concerns unless we add more winter capacity into the portfolio. These occasional adequacy challenges are not consistent issues that are likely to occur in many years. They result from low probability events (nearly one-in-60-years) but are potentially high impact when they do occur due to the potential for large shortfalls.

PORTFOLIO PERFORMANCE



PORTFOLIO COST & FINANCIAL RISK

Among the portfolios we examine, our analysis finds that those with the lowest cost and lowest financial risk involve renewing our BPA contract with the Slice/Block product. However, they do sometimes fail our resource adequacy standard due to the challenge the product can cause in extremely low water conditions. We find that adding 10MW of demand response is the lowest cost and least risky way to improve the adequacy of Slice/Block in extremely low water conditions.

CARBON EMISSIONS

Because all of the portfolios that passed our resource adequacy tests include only non-emitting generating resources, the only carbon entering our portfolio comes from market purchases we make or from those made by BPA that pass through to us. As a result, all of our portfolios are very low carbon.

THE IMPACTS OF CLIMATE CHANGE

We took some first steps to consider climate change in our 2015 IRP by conducting a study to understand the potential impacts of climate change on our resource supply. In our 2020 IRP, we take the next step and made the first attempt at including climate change projections in our model. We will continue improving our approach in our next IRP. Based on the modeling work in our 2020 IRP, we find:



1. Because temperatures are warmer, customers use less during the winter, when we tend to see the highest demand for power. While summer usage increases, the winter reduction is larger.



2. Inflows and power generation tend to be higher overall across the year, especially during the winter. Winter inflows increase because warmer temperatures mean more precipitation falling as rain and less being stored as snow in the mountains. Summer inflows and generation are a little lower because less snowpack is left to melt in the summer, but the summer reduction is smaller than the winter increase.

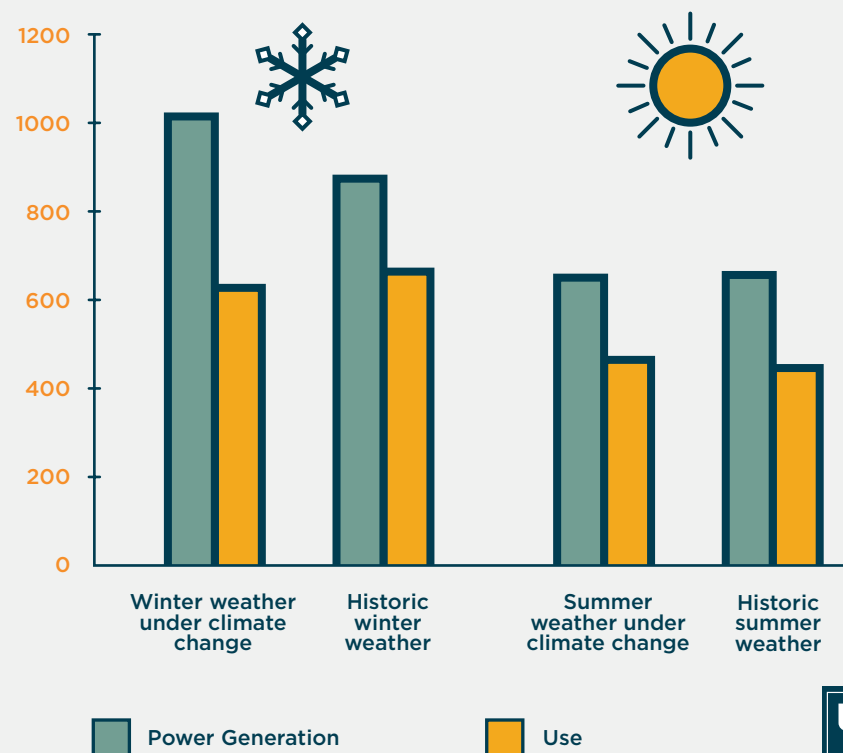


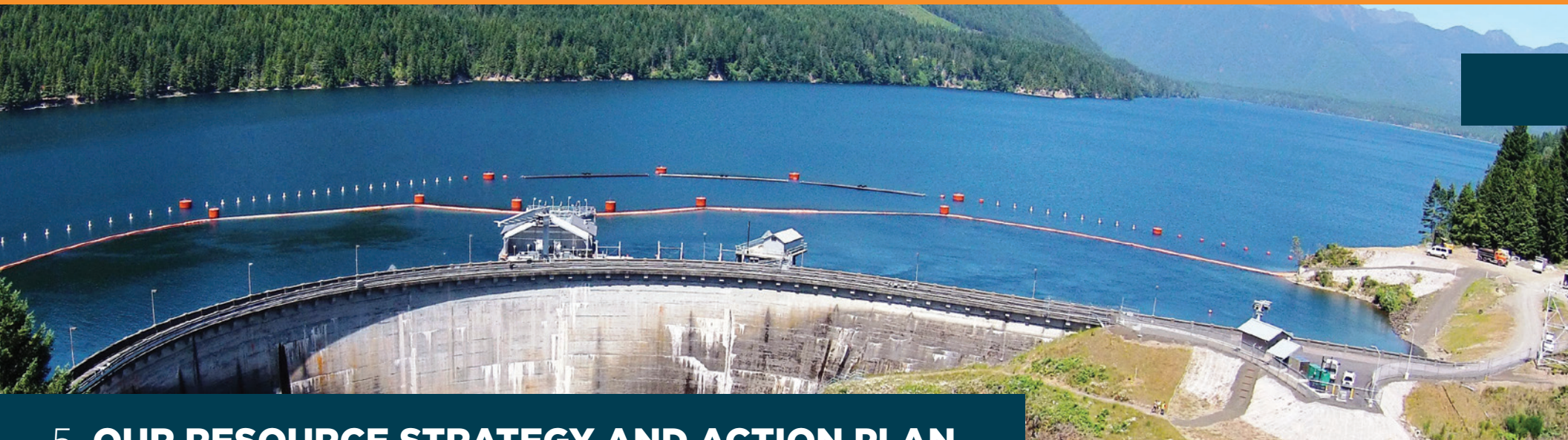
3. The combination of lower winter loads and more winter water generally improves our resource adequacy, but it also points to a change in the type of event we see. Rather than the very low-probability, high-impact events seen with historical weather conditions, some climate models project a higher probability of low-impact events (i.e., small, short-duration events).

Our analysis does not address other types of risks associated with climate change, such as flood risk, transmission system risk from wildfires, or risk to fish from changes to stream temperatures.



AVERAGE POWER GENERATION AND USE WITH CLIMATE CHANGE





5 OUR RESOURCE STRATEGY AND ACTION PLAN

RESOURCE STRATEGY

Our analysis finds that, among the options we model, the lowest cost and least risk resource strategy for 2020:

1. Acquires all the economic and achievable conservation we identify in our 2020 Conservation Potential Assessment (CPA).
2. Allows our CBH contracts to expire without renewal.
3. Adds 10 megawatts of demand response to our portfolio by 2024.
4. Renews our BPA contract with the same product we have now and at the same resource level when the current contract expires in 2028 but continues to evaluate this question in our future IRPs.

ACTION PLAN

Each time we conduct an IRP, we develop an action plan to implement the resource strategy we select and prepare for future IRP analyses. Our action plan takes into account stakeholder and Public Utility Board suggestions, as well as our understanding of the work we need to undertake to move our IRP forward. Our 2020 IRP Action Plan is categorized by the type of action and separated by immediate actions (within two years) and long-term actions (within 10 years).

Action items relating to **resource acquisition or retirement** follow our resource plan, which includes acquiring all cost-effective energy conservation, acquiring 10MW of demand response, and allowing our CBH contracts to expire.

Action items relating to further **resource investigation** over the next two years focus on the two types resources we include in our IRP—BPA products and demand response—and, in the long run, on resources that might hold particular promise for the future, including pumped storage.

Two-year action items relating to the **continued improvement of our modeling tools and analysis approach** represent priority improvements. Over the long run, we will continue to make additional improvements.

Action items relating to **equity and inclusion** are consistent with the priorities of the City of Tacoma and Tacoma Public Utilities to promote equity and inclusion. These action items include developing a metric that will take equity into account in resource decisions and continuing to improve inclusivity in our outreach efforts over the next two years.

VISUAL ACTION PLAN

	NEXT TWO YEARS	NEXT TEN YEARS
Resource Acquisition/Retirement	<ol style="list-style-type: none"> 1. Do not renew CBH and notify parties of our CBH renewal decision 2. Acquire our two-year CPA potential. 	<ol style="list-style-type: none"> 3. Acquire our 10-year CPA target. 4. Pilot cost-effective demand response options and acquire 10MW of demand response
Further Investigation into Resources	<ol style="list-style-type: none"> 5. Actively participate in discussions with BPA about future product options. 6. Conduct a demand response “potential assessment.” 	<ol style="list-style-type: none"> 7. Continue to evaluate our BPA renewal options. 8. Continue to investigate the value of pumped storage. 9. Continue to follow the development of new technologies.
Continue to Improve Modeling and Analysis	<ol style="list-style-type: none"> 10. Refine our climate change modeling. 11. Refine our approach to modeling demand response. 12. Model conservation as a resource in our system model 13. Refine modeling of storage in our WECC and system models. 14. Analyze additional scenarios: electric vehicles and electrification of buildings, ban on natural gas generation in Washington, and lower Snake River dam removal. 	<ol style="list-style-type: none"> 15. Continue to improve the functionality of our system model.
Equity and Inclusion	<ol style="list-style-type: none"> 16. Develop metric(s) to account for equity and inclusion in our decisions about resource acquisition. 17. Continue to improve inclusivity in our stakeholder outreach. 	<ol style="list-style-type: none"> 18. Fully incorporate equity and inclusion into our resource acquisition decisions.



MORE INFORMATION ABOUT THE IRP

Visit [MyTPU.org/IRP](https://www.mystpu.org/IRP) to read the full technical 2020 IRP.



2020 Integrated Resource Plan