



# 2023 Integrated Resource Plan

July 2023



## 1 LETTER FROM THE GENERAL MANAGER

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The energy industry is undergoing enormous change.

In recent years, the cost of batteries, wind, and solar generation have declined, making them among the least-cost energy sources available. But substantial hurdles remain in integrating these resources into the electric grid in an efficient, cost-effective way. Dispatchable, flexible fossil fuel resources face tighter and tighter constraints, with few zero-carbon options to replace their reliable contribution to the grid. Meanwhile, transmission availability will likely be a key limitation as new renewable generation is added to the grid.

To navigate this volatile energy landscape, EWEB's 2023 Integrated Resource Plan forecasts EWEB's energy demand 20 years into the future and examines a variety of energy resources that may fit those future needs. As EWEB's current contracts expire over the next two to eight years, we will need to decide how to procure the energy that we serve to our customers.

EWEB conducted rigorous analysis to generate a set of possible future energy resource portfolios that are adapted to various possible future conditions. None of these are preferred portfolios. Rather, the portfolios offer insights into how varying future conditions affect our energy needs, and options for meeting them.

The first portfolio is a reference case, which is derived from a baseline set of assumptions that the future will largely be an extension of the present. The assumptions address future resource costs, inflation, regulatory standards, transmission availability and market conditions, among other factors. Three additional portfolios tweak those assumptions and explore how EWEB's energy options shift as future conditions depart from the present in crucial – and increasingly likely – ways.

Every portfolio falls within clear parameters incorporated into the analysis process. EWEB's analysts designed those parameters to reflect core values of reliability, affordability, and environmental responsibility.

- **Reliability:** Portfolios must meet our peak needs, which occur during the coldest winter days.
- **Affordability:** Portfolios must be the least-cost option, within other constraints.
- **Environmental responsibility:** Portfolios must abide by EWEB's Climate Change Policy, which states that our energy will be 95% carbon-free by 2030.

The 2023 IRP has yielded several key insights:

**Energy demand will rise.** Over the past few decades, EWEB's energy demand has remained flat, despite population growth. We expect this trend to change. Electrification is happening. Massive investments in electric vehicles and electric heating and cooling will add more demand to the grid. Industrial loads may also prompt increases in demand. It's not a question of if, but rather how much and how soon.

**Legacy hydropower is a good fit.** EWEB has relied on hydropower from the Bonneville Power Administration (BPA) and our own projects for many decades, and for good reason. It's a cheap, carbon-free resource that can be dispatched at a moment's notice to meet our customer's demand. We will start evaluating BPA's 2028 product options in our next IRP, which we plan to publish in 2025.

**Wind and batteries offer one viable path forward.** The reference case suggests that EWEB pursue a large buildout of batteries, paired with new wind resources. This makes sense. In the greater Northwest,

wind is an abundant renewable resource that generally produces power during the same seasons we have peak needs. And utility-scale batteries will help smooth gaps in that power generation.

**Zero-carbon, dispatchable resources will likely be necessary in the future.** Full decarbonization will require us to add a new type of resource to our portfolio – one that is zero-carbon, can dispatch energy on-demand, and has a fuel supply that can last weeks or months. Only this type of resource will allow us to reliably serve electricity when conditions are the most challenging. But the list of options is short.

**We need to develop customer programs responsive to our energy needs.** Utilities around the country are developing innovative projects and policies that partner with customers to reduce demand for electricity. Some shave peak demand through demand response programs and time-of-use rates. Others use novel rate structures to ensure that the cost of maintaining and improving the grid is equitably shared. We will need to explore similar innovations as we begin to understand our individual customer’s electricity loads better.

Though we’ve gleaned many insights from months of analysis, we’ve finished this 2023 IRP with more questions than answers. For the moment, we don’t need to procure any new resources. Our first need for energy resources occurs in 2026, but that time will arrive before we know it. We must be ready.

We know that much more work is ahead. To that end, we’ve created a list of action items (see section 3) that will guide us as we continue study, learn, develop new programs and improve our analysis abilities. And we’re already starting on the 2025 IRP, which will analyze product options from BPA.

The IRP process is iterative, and we will continue sharing results with our community as produce them, so we can all learn together and collaborate. We encourage you to read this 2023 report and tell us what you think at [www.eweb.org/irp](http://www.eweb.org/irp). Because only together can we chart our path to a future of clean, reliable, and affordable energy.

Sincerely,

Frank Lawson

## 2 EXECUTIVE SUMMARY

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The Eugene Water and Electric Board (EWEB) has been providing power to the Eugene community since 1911 when the Walterville Dam on the McKenzie River was completed. EWEB is the largest publicly owned utility in Oregon and is governed by a five-member Board of Commissioners who are elected by Eugene residents.

EWEB’s 2023 Integrated Resource Plan (IRP) is the first in a decade, although the next one will arrive much sooner. EWEB is embarking on an iterative, biennial process in which we develop and publish a new IRP every two years. This will allow EWEB staff to continually update assumptions and forecasts to plan for a more dynamic energy future.

### ***What is an IRP?***

An Integrated Resource Plan is a long-term planning document to identify EWEB’s energy needs and the best resource options to meet those needs. The IRP relies on modeling, analysis, and public input to provide a 20-year look at future portfolio options and identify a nearer-term (2-5 year) action plan.

### **Goals of EWEB’s 2023 IRP:**

1. Modernize our approach to energy resource planning to make it more robust, dynamic, routine, and useful, while developing in-house expertise.
2. Understand EWEB’s needs for energy and capacity in the future.
3. Identify least-cost, “best fit” resources.
4. Consider tradeoffs and values when developing action plans.

The 2023 IRP has accomplished these goals by providing the first step in EWEB’s iterative efforts to modernize our approach to energy resource planning. It has established an initial set of tools and analysis that can be used to identify least-cost resource portfolios and established forecasts for EWEB energy and capacity needs in the future.

Through public stakeholder engagement, the 2023 IRP process has also spurred discussion about the tradeoffs of different resource approaches and how EWEB will incorporate community feedback, climate change impacts, and principles such as diversity, equity, and inclusion into our future decision-making. Most importantly, this IRP includes a set of recommended actions that the utility can take in the next 2-3 years to make progress on long-term strategic goals related to EWEB’s power supply. These actions will be essential to providing the community with a least-cost power supply that meets EWEB’s policy target of providing 95% carbon-free electricity by 2030.

### ***Climate Change***

*EWEB expects that climate change will impact both energy loads and resource performance in the future. EWEB staff continue to look for opportunities to incorporate climate change assumptions and scenarios into future analysis.*



## ***Key Insights from 2023 IRP Modeling and Analysis***

**Energy demand will rise.** While our overall demand has fallen or remained flat in recent years due to conservation investments, we expect this trend to change starting around 2030 due to electrification.

**Peak needs will continue to occur during the winter.** EWEB’s capacity needs are calculated using a 1-in-2 peak hour standard, meaning the portfolio of resources should be sufficient to meet EWEB’s highest hour of load in a typical year. For the next 20 years, EWEB is expected to be a winter-peaking utility and the primary driver for increased peak energy use is unmanaged electric vehicle charging behavior.

**EWEB will have small peak winter capacity needs starting in 2026.** Based on an average single-hour winter peak, EWEB begins to need a small amount of capacity starting in 2026. This small need can be met through market purchases or extension/re-negotiation of existing contracts.

**Hydropower is a good fit.** Currently, more than 80% of EWEB’s energy comes from hydropower, both from the Bonneville Power Administration (BPA) and EWEB-owned projects on the McKenzie and Clackamas Rivers. IRP analysis points towards BPA hydropower remaining as a cost-effective, low-carbon way to meet most of EWEB’s needs.

**Wind and batteries are promising options.** The IRP modeling software selected primarily a combination of wind and batteries to meet growing demand in the future.

**Customer partnerships will be vital.** Customers are likely to play an integral role in helping reduce peak energy usage. Programs such as conservation, demand response, and new rate designs, such as time-of-use rates, were all selected across various portfolios.

**Zero-carbon, dispatchable resources will likely be necessary in the future.** As EWEB and the Pacific Northwest region pursue full decarbonization, there will likely be a need for dispatchable resources like small modular nuclear reactors (SMR) or geothermal that do not create emissions and can be relied upon for extended periods of time.



*EWEB’s Trail Bridge Dam.*

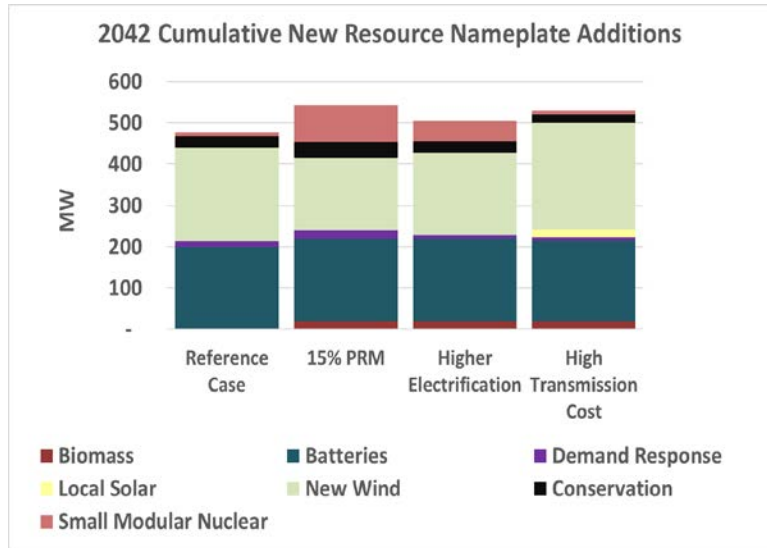


*EWEB’s High Banks Substation*

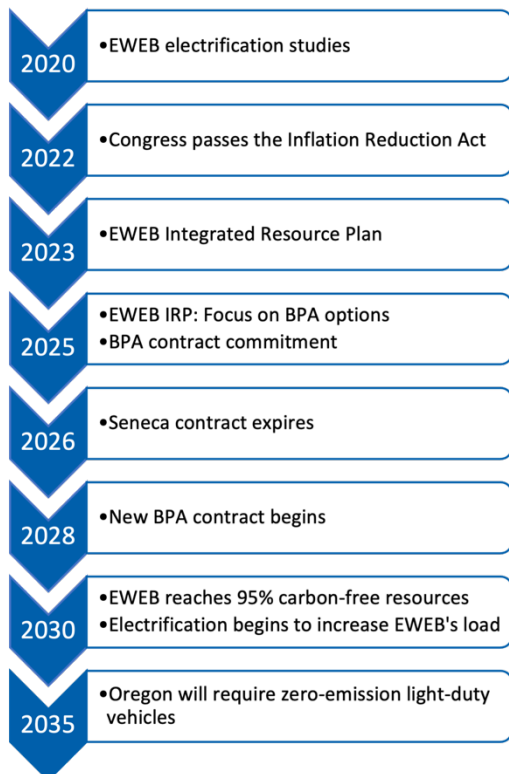
### IRP Modeling Results

The 2023 IRP contains a reference case that represents a baseline modeling result, as well as sensitivity analyses that examine portfolio selections under alternate conditions. In all of these cases, EWEB staff designed the modeling process to select the lowest cost, optimized portfolio within the constraints set by EWEB Board policy and other regulatory obligations. These constraints include a requirement for EWEB’s energy to be 95% carbon-free by 2030 in all portfolios.

Modeling results indicate that continuing EWEB’s contract with the Bonneville Power Administration (BPA) will be a key element of EWEB’s least-cost portfolio. This is assumed to be a foundation of EWEB’s portfolio in all cases. The reference case and sensitivities also suggest that additional resource needs could primarily be met with conservation, demand response, batteries, and wind power. Sensitivities with greater peak capacity needs, such as the 15% planning reserve margin (PRM) or higher electrification, selected more dispatchable, zero-carbon resources like small modular reactor (at right).



### Next Steps – 2024 and Beyond



Due to the rapidly changing energy landscape – including uncertainty around electrification, future technologies and costs, and climate change – the future is increasingly difficult to predict. In response, EWEB’s IRP process is evolving to be more iterative, continuously adapting to new information about EWEB’s electricity demands and the potential resources that could meet our needs in the future. This iterative IRP process will allow EWEB’s Board of Commissioners to develop near-term strategies while adapting to new information, assumptions, and operational conditions.

As part of the final IRP, the Board will pass a resolution to adopt the 2023 Action Plan, which is informed by EWEB’s values, public feedback, staff analysis, and modeling results. The Action Plan (section 3) identifies steps that can be taken in the next 2-3 years based on the 20-year planning horizon of the IRP.

### 3 ACTION PLAN

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#### **IRP Action Plan and EWEB Strategic Priorities (see Appendix A for detailed Action Plan)**

Over the next decade, EWEB will make decisions on power supply and local infrastructure investments worth billions of dollars. With this in mind, EWEB's [2018-2028 Strategic Plan](#) identifies several timeframes and focus areas for the utility. The 2023 IRP is part of the “Mid-Game” strategy to “build the foundational pieces that facilitate future consumption and operational flexibility.” In this context, the modeling work and analysis in the 2023 IRP will serve as a foundation to inform strategic power supply decisions.

The Action Plan considers the analysis and context documented in the IRP and provides a nearer-term (2-3 year) set of actions to build towards our long-term goals. In this context, the IRP is directional – it does not set out a specific resource strategy or require EWEB to invest in specific technologies. Many of the actions in the 2023 Action Plan direct the utility to perform more detailed analysis or collect information that will be essential to upcoming decisions.

The themes of the 2023 IRP – load growth from electrification, ongoing decarbonization, and the challenges of navigating an electric sector that increasingly relies on intermittent renewable generation – inform actions that provide EWEB with flexibility and adaptability. These actions include analysis of local, demand-side resources like conservation and demand response, as well as further engagement with existing supply-side contracts like the Bonneville Power Administration or other local resources. Information from these studies and discussions will inform the 2025 IRP, building on the iterative nature of the IRP process.

See **Appendix A: Action Plan** for a more detailed discussion of the actions identified below.

Action Plan Focus Areas:

**1. Actively engage in BPA’s post-2028 contract negotiations to develop and analyze new power products.**

EWEB’s BPA Power contract accounts for roughly 80% of our power supply. Our current BPA contract expires in 2028, and EWEB expects to be in a position to sign a new contract in the fall of 2025. Defining and negotiating EWEB’s BPA contract post-2028 is essential to understanding our other resource needs.

**2. Study energy efficiency cost and potential in EWEB’s service territory.**

Conservation has been a preferred resource for EWEB over the past decades because it is available locally, is often cost-effective due to transmission and distribution savings, and offsets the need for new generating resources. Conservation was selected in the IRP analysis, but EWEB has not recently assessed the potential to acquire new energy efficiency in our service territory. An updated assessment will be essential to understanding how much local resource is available, and at what point it will not be able to keep up with increased energy demand from electrification.

**3. Study demand response cost and potential in EWEB’s service territory, and design a product plan.**

Customer demand response programs have been highlighted as an area of interest for several years, and the IRP confirmed that they could be key resources going forward to help meet EWEB’s peak demands. With technological advancement of smart devices, rollout of smart metering infrastructure, and market penetration of electric vehicles, there are new opportunities to leverage technology and develop demand response programs. Conducting further analysis of demand response will allow us to understand the cost and availability of the resource in our service territory and the potential value of peak reduction.

**4. Engage with existing local resource owners/operators to determine areas of opportunity.**

Several of EWEB’s contracts with existing, local energy resources are set to expire in the next several years. Given that EWEB already has relationships with these suppliers and may be able to reach agreements that are mutually beneficial, EWEB will engage with them to determine areas of opportunity.

**5. Develop a resource acquisition strategy and framework for future resource needs.**

The IRP identified future resource needs that will likely outstrip the capabilities of existing contracts or owned resources. EWEB will develop a resource acquisition strategy and process that aligns with our strategic priorities and values to standardize and streamline future resource investment.

**6. Track and identify organized electric market impacts and opportunities for EWEB.**

The expansion of organized markets such as the California Independent System Operator’s (CAISO) Extended Day Ahead Market, or the Southwest Power Pool’s Markets +, has the potential to substantially impact how EWEB transacts power and integrates resources. Similarly, the onset of the Western Resource Adequacy Program (WRAP) may impose new planning standards on EWEB. Tracking these processes, and preparing for how they will impact EWEB, will be essential to positioning EWEB to navigate the future energy landscape.

**7. Update IRP modeling assumptions and tools.**

The IRP is a cyclical process of continuous improvement and updated analysis. Staff have identified opportunities to update input assumptions for loads and resource options based on new information, as well as several modeling changes that will improve EWEB’s system planning analytics.

**8. Prepare key inputs for the 2025 IRP.**

The 2025 IRP will roughly coincide with the timing of EWEB’s 2028 BPA contract decision. Analytical and modeling work will need to be updated to reflect new BPA product options, as well as any new information from EWEB’s demand response and conservation potential assessments.