MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO:	Commissioners Brown, Carlson, Morris, Schlossberg, and Barofsky
FROM:	Brian Booth, Chief Energy Resource Officer; Megan Capper, Energy Resource Manager; Jonathan Hart, Power Planning Supervisor; Frank Lawson, CEO & General Manager
DATE:	April 2, 2026 (April 7, 2026, Board Meeting)
SUBJECT:	RESOURCE ADEQUACY AND LOCAL OPPORTUNITIES – **PART 1 OF 2** ***Pacific Northwest Regional Resource Adequacy Update***
OBJECTIVE:	Information

Issue

The Board was provided information in January [Link Here] discussing forecasted resource adequacy challenges in the Pacific Northwest. Staff will provide information and respond to questions on this correspondence on regional trends, results from these studies, and EWEB's approach to strengthening near-term local resource adequacy at the April Board meeting.

Background

Regional Resource Adequacy

EWEB has been tracking the rising potential for resource adequacy issues in the Northwest for the past several years. With the post-COVID boom in regional electricity consumption, driven by electrification, economic growth, and technology (including data centers), the region has seen higher and more volatile wholesale electricity prices and tighter markets, reflecting reduced surplus generating capacity during peak periods. This growth is occurring at the same time as large "baseload" coal generation in the region has either shut down or is scheduled to shut down in the near future.

Utilities have responded to this increase in demand by attempting to increase supply, with additional gigawatts of new renewables, storage, and dispatchable (thermal) generation being planned, permitted, or under construction. However, these projects are hampered by supply chain challenges and transmission congestion and, by some measures, would still be insufficient even if all planned projects were completed on time.

Multiple studies from reputable and diverse organizations have shown this issue to be credible and growing. Energy Environmental Economics (E3) published a study in 2019[1], showing that although the Northwest had a less than 5 percent chance of facing rolling

1 https://www.ethree.com/wp-content/uploads/2019/03/E3_Resource_Adequacy_in_the_Pacific-Northwest_March_2019.pdf

blackouts at that time, prolonged cold winter events that were modeled could result in 65 hours of shortfall every decade under those modeled conditions, substantially more than the 24 hours that are considered acceptable.

Regional reliability entities and utilities were alerted to the immediacy and magnitude of this issue when E3 released its "Phase 1" study last year[2], showing a small but growing double-digit chance of rolling blackouts in the Northwest. This risk first appears under stressed conditions in winter 2026 and grows to a magnitude between 5.6 and 8.7 gigawatts by 2030, depending on how many of the generating projects currently under construction are completed on time. Sylvan Energy Analytics, in partnership with Gridlab, recently published its own study and review of E3's findings[3] and confirmed that there is a growing problem that must be addressed.

The Northwest Power and Conservation Council recognized this risk in 2023 when it published its Pacific Northwest Power Supply Adequacy Assessment for 2027[4] which showed multiple future scenarios in which the odds of a regional shortfall increased into the double digits, beyond normal tolerances.

The Pacific Northwest Utility Conference Committee (PNUCC) 2025 Northwest Regional Forecast[5], which is an aggregation of utility integrated resource plans (general and loads) from investor- and community-owned utilities across the region, stated the *"region is dangerously close to experiencing significant energy supply disruption, which could lead to blackouts during peak demand events. Energy emergencies during extreme weather events are increasing in frequency and threatening reliability." The report concluded that* while there is convincing evidence that demand for electricity is clearly rising, plans for new large loads and the energy transition may be delayed due to challenges in expanding energy infrastructure. Addressing these difficulties is critical to ensuring a reliable, affordable and resilient power supply for the region.

Resource adequacy challenges are not just isolated to the Pacific Northwest but are also a concern across the entire western interconnection (wester grid). WECC is a regional entity that coordinates and plans for the reliability and secure operation of the electric system in the West. According to the WECC Western Assessment of Resource Adequacy 20246, the pace of change is increasing the risks to reliability across North America. The supply of electricity is not growing fast enough to keep up with demand growth. What was once a simple problem of supply and demand has become complicated by rapid change and increasing variability. Unless we prioritize reliability as the resource mix evolves and becomes more variable, we are at risk for serious and more frequent disruptions. The West must move quickly and more decisively to ensure resource adequacy over the next decade.

---

2 https://www.newsdata.com/clearing_up/supply_and_demand/new-study-projects-nearly-9-gw-resource-gap-in-pacific-northwest-by-2030/article_c0be8707-4a11-4b4e-bc47-948bb0e526eb.html
3 https://gridlab.org/portfolio-item/pnw_nearterm_winterra/
4 https://www.nwcouncil.org/fs/18158/2023-1_adequacyassessment.pdf
5 https://www.pnucc.org/wp-content/uploads/2025-PNUCC-Northwest-Regional-Forecast-final.pdf
6 https://feature.wecc.org/wara/

While every study involves assumptions by analysts, and therefore yields an expected range of results, they have all shown the same conclusion: the Northwest must proactively address growing multi-day winter capacity shortfalls or risk rolling blackouts. This includes generators, gas suppliers, transmission owners and operators, and load-serving utilities like EWEB.

Potential Customer Impacts

If regional shortfalls occur, EWEB could be directed to shed load by turning off electricity supply to customers or offsetting load through local generation. This order would come from our Balancing Authority, the Bonneville Power Administration (BPA), and EWEB system controllers (dispatchers) would have minutes to respond. EWEB has a "Load Shedding" procedure in place for this event, whereby dispatchers would drop service to as many feeders and/or substations as are required to meet the order. Feeders without critical public services (e.g. hospitals, police, fire, wastewater, etc.) would be shut off first while every attempt would be made to preserve electric service for critical services. These rolling blackouts would last for a number of hours per feeder before being rotated to others. The duration of the feeder outages would depend on the number of feeders that must be dropped to meet the required amount of load shedding. Rolling blackouts are considered a last resort measure to prevent uncontrolled cascading outages and protect the integrity of the broader grid.

EWEB and other utilities recognize that even short-duration outages during extreme weather can pose challenges and potential dangers for customers, particularly vulnerable populations and critical facilities. During winter conditions, such interruptions could affect heating systems, traffic control, businesses, and essential services.

In January 2024, the Northwest experienced conditions that could have triggered rolling blackouts during a period of extreme cold when high loads coincided with partial outages on the Northwest's major transmission intertie with California and natural gas supply curtailments due to an unplanned multi-hour outage of the Jackson Prairie natural gas storage facility in Washington. For EWEB at this time, temperatures were cold with ice-related outages at Carmen Smith, Walterville, and our generator at International Paper that left us purchasing power in a very expensive market.

EWEB's Role in Resource Adequacy

As discussed in the January memo, the selection of the Block with Shaping product from BPA leaves EWEB with the obligation (and flexibility) to balance and integrate its retail customer load with the rest of the region. Additionally, independent of this BPA product choice, EWEB will be required to integrate its generating resources with emerging organized markets. These markets, including the SPP Markets+ day-ahead wholesale market (exchange) selected by BPA (EWEB's Balancing Authority) will place resource adequacy requirements on all participants including EWEB. Successful integration of retail customer load and generation resources is necessary to maintain grid reliability.

A requirement of SPP Markets+ and the Western Resource Adequacy Program will be that EWEB demonstrate (which includes operational performance data) access to resources capable of meeting its peak capacity needs under defined, including constrained, conditions. Strategic situational use of the University of Oregon turbine, as discussed in Part 2 of this correspondence piece, has been identified as one of several countermeasures that EWEB could deploy in regionally constrained situations.

It should be noted that while the Northwest power market runs on contracts that emulate the physics of the underlying grid, it is the physics that ultimately drive reliability. While EWEB could be individually resource adequate, the regional grid could still be impacted by rolling blackouts. If ordered to shed load by the BPA, EWEB must comply. Even if BPA were resource adequate, EWEB could still be impacted by uncontrolled cascading outages if the broader regional grid were to collapse. Put bluntly, there is a scenario in which EWEB does its part and is still subject to a larger system failure, which is why coordination with regional partners through adequacy standards set under the WRAP program is important.

All of the scenarios described above are possibilities, not certainties. The odds are that the combination of poor hydro conditions and extreme winter weather that would drive a shortfall does not materialize and that the grid remains stable for years to come. There is also a very real scenario in which neighboring balancing areas and other electric utilities experience rolling blackouts, while EWEB is able to avoid them, or at least mitigate impacts to residents through prevention strategies.

Discussion

Common Regional Recommendation

E3 and Sylvan/Gridlab have recommended a number of near-term actions for strengthening the grid until additional generation and transmission can be built. In Phase 2 of the study, E3 also offers guidance on long-term solutions and models least-cost portfolios under various policy and technological constraints. Near-term recommendations that are readily actionable by EWEB include:

- **Develop demand management strategies that focus on winter needs.** These include energy efficiency investments that provide heating benefits and demand response programs that minimize impacts to residential customers should load shedding be required. Gridlab specifically identified large-load curtailments as a way to shield residential customers under most scenarios.
- **Prepare for potential emergency conditions.** These preparations include mobilizing emergency backup generators, re-evaluating hydro emergency operations, and refreshing load shedding procedures.

Other regional recommendations include permitting and interconnection reforms to accelerate new generation development, greater regional coordination, and careful management of large-load interconnection requests. These are less directly actionable by EWEB but staff are engaged in these policy areas within our service territory and with our regional partners.

EWEB Near-Term Actions (Responses to Recommendations)

EWEB staff have been actively working on the near-term, actionable recommendations. As approved by the Board, EWEB's 2026 Annual Organizational Goal 8 *"Large Customer Peak Mitigation - Refine the Demand Side Management Plan (DSMP) and rate-design planning based on initial peak mitigation initiatives with largest electric customers"* initiates this recommendation. It is expected that EWEB will focus on our largest "contract-based"

customers in 2026, targeted commercial and industrial applications/segments in 2027, and aggregated residential programs in 2028.

EWEB continues to invest in all cost-effective energy efficiency and will develop a Demand-Side Management (Implementation) Plan in 2026 in response to the results of the Demand-Side Potential Assessment completed in 2025.

Per EWEB's 2026 annual goals, EWEB is also working with the utility's largest customers to reduce their contribution to EWEB's peak loads, particularly during times of grid stress.

Staff are also preparing for potential emergency conditions. Emergency backup generators can supplement typical utility generation during critical moments and provide grid support that could help avoid or mitigate rolling blackouts. As discussed in this packet, staff have engaged the University of Oregon on a pilot agreement in which EWEB can call upon UO's combined heat and power plant during times of grid stress.

Should rolling blackouts prove unavoidable, it is critically important that load shedding be executed in an organized and controlled manner. If handled quickly and deliberately, such events could be relatively benign, with short outages rotating from one neighborhood to the next. If mishandled, outages could cascade and escalate rapidly, an experience Texas endured several years ago and one that the Northwest should take every possible measure to avoid.

For the long term, E3 offers a number of additional recommendations and models least-cost portfolios under various assumptions. These options and those recommended by the NW Council, Sylvan/Gridlab, and others will be explored further as part of EWEB's 2027 Energy Resource Study.

Community Awareness and Engagement

As EWEB evaluates both near-term and long-term strategies to address resource adequacy risks, staff recognize that these decisions involve trade-offs that are of interest to customers and the broader community.

EWEB will seek to ensure transparency around these efforts and will use existing communication and engagement channels, such as the Power Partners e-newsletter and the Community Table dialogue forum, to share information and, where appropriate, invite feedback as options are evaluated.

Recommendation and Requested Action

No Board action is requested at this time. This information is presented for background and context on an operational issue relevant to electricity delivery in the Pacific Northwest. Future Board actions may be informed by this information.

MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO: Commissioners Brown, Carlson, Morris, Schlossberg, and Barofsky

FROM: Frank Lawson, CEO & General Manager; Brian Booth, Chief Energy Resource Officer

DATE: April 2, 2026 (April 7, 2026, Board Meeting)

SUBJECT: RESOURCE ADEQUACY AND LOCAL OPPORTUNITIES – **PART 2 OF 2** ***University of Oregon Generator Pilot Agreement***

OBJECTIVE: Information

Issue

This memo provides background on EWEB's generation pilot study with the University of Oregon (UO) exploring potential uses and operating characteristics of UO's Combined Heat and Power (CHP) facility, and why it is prudent for EWEB to understand the operating, economic, and environmental characteristics of this locally available resource as it pertains to regional grid reliability, environmental policies, and regulatory obligations.

Background & Discussion

Overview of the Facility

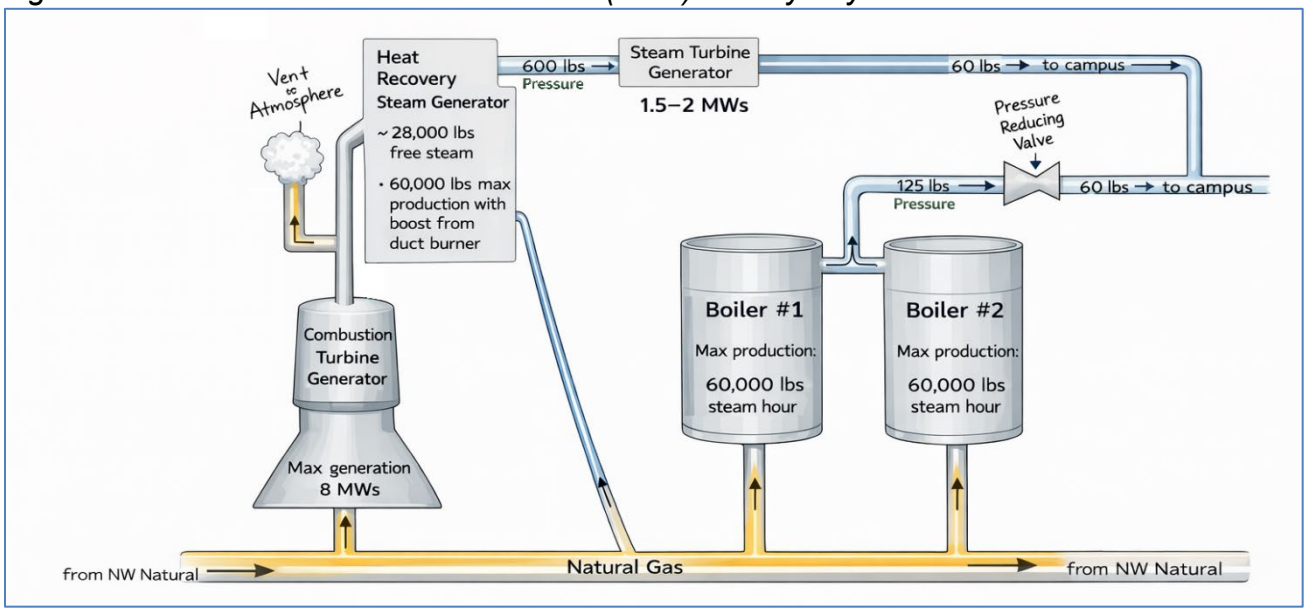
The University of Oregon owns and operates a 10 MW combined heat and power facility that was placed in service in 2011. The plant was designed and permitted to operate for extended periods, but for much of the past decade it has been run sparingly - kept in reserve as a backup generator due to "soft" wholesale electric market conditions.

The facility consists of three primary components:

1. An approximately 8 MW combustion turbine generator, which is operationally similar to natural gas peaking turbines used throughout the Northwest.
2. A heat recovery steam generator that captures waste heat from the turbine exhaust to produce steam for campus heating. This system includes duct burners that allow UO to regulate and supplement steam production to meet campus heating needs.
3. A steam turbine generator that produces additional electricity by stepping steam pressure down from roughly 600 psi to 60 psi before the steam is delivered to the campus heating system.

With the CHP facility operating and producing electricity, UO can fully shut down one of its two large campus natural gas boilers, using the remaining boiler only intermittently when steam demand exceeds CHP output. As a "dual fuel" generator, the CHP primarily runs on natural gas but is capable of using UO's supply of "R99" renewable diesel during periods when the gas system is unavailable.

Figure 1 – UO Combined Heat and Power (CHP) Facility Layout



Efficiency and Environmental Performance

The CHP, when producing electricity alone, achieves an electric heat rate of approximately 10,000 Btu per kWh, or about a 34 percent efficiency. When waste heat recovery for steam production and generation from the steam turbine generator are included, the overall system efficiency increases to roughly 87 percent. This is significantly more efficient than typical regional peaking generators that operate in the Northwest wholesale market. For comparison, natural gas power plants achieve efficiencies ranging from 35% in simple cycle turbines up to 60% in combined cycle plants, while coal-fired power plants typically convert 30–45% of the energy in coal into electricity.

EWEB's Obligations & Interests

Public Utility Regulatory Policies Act (PURPA)

The Public Utility Regulatory Policies Act (PURPA) requires utilities to offer "avoided cost" rates to all small, local generators that are fueled by renewable energy or are deemed to be high efficiency cogeneration – facilities that efficiently use steam for both electricity generation and also for complementary purposes such as heat or industrial production. EWEB is legally obligated to accept the power produced and compensate the owners of such "Qualifying Facilities." As cogeneration, the CHP is a Qualifying Facility and EWEB has historically met its PURPA obligation by offering UO market-based rates for any electricity they generate – an existing contract effective outside of the terms of this pilot agreement.

Regional Obligations

Regional studies that model the relationship between generating resources and electric consumption show an increasing likelihood and magnitude of electricity insufficiency under constrained and peak conditions, typically during a multi-day widespread winter cold weather event when other variable resources (wind, solar, hydro) are constrained. These conditions

exist now and are expected to worsen in the coming years before substantial resources and transmission can be built. Beginning several years ago, similar early studies prompted many in the industry, including EWEB, to support a regional approach to resource adequacy that resulted in the Western Power Pool developing the Western Resource Adequacy Program (WRAP).

In October 2028, EWEB will be undergoing several financial and operational changes. The first change is that EWEB will be switching from the Slice/Block BPA product to the Block with Shaping product. In addition to the BPA product change, BPA has indicated that it intends to join Southwest Power Pool's Markets+ Organized Day-Ahead Wholesale Electricity Market (Exchange) - also beginning October 2028. As a nested utility within BPA's balancing area, EWEB will be required to join as well. This change will impact EWEB's metering, communications, and wholesale operations for load service and all of EWEB's owned generation assets.

A requirement of joining SPP's Markets+ is participation in the Western Resource Adequacy Program (WRAP), which will require participating entities like EWEB and BPA to prove to the program operator that they have secured enough power to meet their typical peak demand, plus a buffer called a Planning Reserve Margin. The UO pilot study will help quantify the CHP facility as a potential resource to meet this requirement and avoid costlier and dirtier options, whether or not, or how often, the resource is dispatched.

Terms of the Pilot Agreement

EWEB and UO agreed to a short-term pilot during January and February of this year to evaluate the operational, economic, and environmental performance of the CHP when dispatched for grid support. Gathering actual performance data is required for a resource to qualify, and be certified, as a resource in order to meet regional regulatory reliability standards and/or market requirements. It is also necessary to have fact-based discussions with Commissioners and the community and make informed decisions.

Key elements of the agreement include:

- Neither party is expected to experience a net financial cost.
- The unit will be operated under conditions when carbon emissions across the region are high, typically during constrained periods when thermal "marginal resources" are dispatched.
- EWEB wholesale power traders monitor market conditions and identify periods when operating the CHP would be both economically and environmentally beneficial.
- UO operates the turbine at EWEB's request.
- EWEB reimburses UO for all fuel costs used by the combustion turbine generator plus a percentage of fuel consumed by the HRSG.
- EWEB receives all electricity generated by the facility during dispatch periods.
- UO receives all steam from the CHP, significantly reducing the amount of gas they need to purchase for campus heating.
- UO has committed all financial benefits realized from this pilot agreement to their Energy Efficiency fund.

Pilot Study Status

So far (as of March 31, 2026), the CHP has not been dispatched to produce electricity under the terms of the pilot because of economic criteria, low wholesale electricity prices driven by generally mild weather, and not because of any operational or environmental limitations. Strong December precipitation refilled hydro reservoirs (Upper Columbia Basin) and mild temperatures allowed gas storage to reach multiyear highs. As a result, wholesale power prices declined significantly after the pilot was executed, making operation neither economic nor necessary from a reliability standpoint. While January was modestly cooler than average, there were no extreme multi-day cold events that could have triggered use of the CHP.

This result is consistent with the pilot's intent. The purpose of the agreement is not to operate the CHP indiscriminately, but rather to ensure it is available when it provides clear system value. The fact that the unit has not been needed to date indicates that regional conditions have not required its use. During this time, EWEB and UO staff have been in regular communications regarding market conditions and UO's operating constraints – conversations that are expected to pay dividends if and when the CHP is called upon.

UO and EWEB staff have indicated intent to extend the pilot through March so as to continue monitoring for a time when we believe the CHP would provide a net benefit to UO, EWEB, and the region.

Reliability Value

The CHP is capable of providing meaningful local reliability benefits during multi-hour to multi-day extreme winter events, when renewable resources and battery storage is not applicable. At full output, the generator can support 2,000 homes during the single highest-load hour of a cold event. Averaged over a multi-day cold period, the number of homes supported would be substantially higher.

Regional reliability studies continue to show a growing risk of winter capacity shortfalls in the Pacific Northwest, particularly during prolonged cold weather. Local, dispatchable resources such as the UO CHP, combined with demand response agreements, improve EWEB's ability to manage these events and reduce the likelihood of rolling outages for customers.

Role of Renewables

Renewable resources remain central to EWEB's long-term strategy, as does conservation and energy efficiency. For the next few years, EWEB owns or has contracted for ample resources that put us in an energy surplus during most of the hours of the year. When EWEB has the option, resources without a "fuel cost" (water, wind, sunshine) will be the preferred choice. However, different resources serve different system needs. Both the federal hydro system and EWEB's hydro assets provide firm, dispatchable carbon-free energy year-round but are not capable of meeting all of our needs at every moment. Our substantial wind resources provide useful energy throughout the year but are not dependable during prolonged winter cold events.

When considering other resources, there are many options to choose from. Solar is affordable and widely available but its production peaks in the sunny days in the middle of the year and bottoms out in the deepest, darkest hours of the winter – the hours in which the CHP could provide the most benefit. Four-hour battery storage is well suited to morning

or evening peak management, similar to what occurs in California and the desert Southwest in summer. This technology has been particularly successful when it can soak up mid-day solar and discharge that energy in the evening when the sun goes down but home energy consumption remains high. However, 4-hour batteries are not well suited to cover the multi-day energy deficits that we can expect during winter cold events. Long duration storage is an emerging technology with potential, but at this state is not mature, affordable, or widely available.

New firm, carbon-free generating resources such as biomass or geothermal are more mature technologies but are generally site-specific and/or very expensive. Staff view these resources - which generate power all year - as viable options for addressing load growth but do not view them as right-sized solutions for addressing a handful of winter peak hours.

Assets such as the CHP pilot do not replace renewable investments. Instead, they complement them by providing highly efficient, dispatchable options during periods when renewable output is low and system risk is highest.

Conclusion

The pilot between EWEB and UO evaluates and quantifies an opportunity to leverage an existing, highly efficient local resource to support reliability, meet emerging regional obligations and regulations, and reduce regional emissions during critical winter periods. The study will allow EWEB to evaluate real-world performance, operational coordination, and system benefits before considering any longer-term arrangements.

EWEB staff will work with UO to gather data from this pilot agreement, publish a report, and work with the Board and public to inform future decisions.

Recommendation & Board Action

No Board action is required at this time. This is an informational memorandum only.