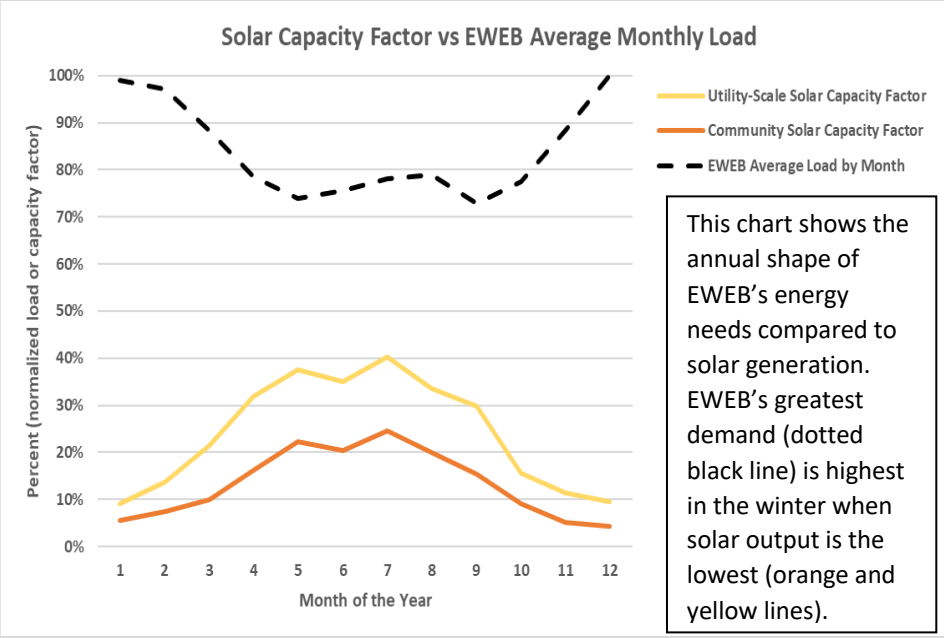
Is Solar a Good Fit for Our Community's Energy Needs?

With the release of EWEB's draft 2023 Integrated Resource Plan (IRP), some have questions about initial modeling results and the types of resources that will best serve our community in the coming decades. In particular, solar resources are often discussed as a potential solution to our energy needs. Solar resources can have benefits: solar panels can be installed in a variety of locations, their cost has declined dramatically over the past decade, and they provide clean energy. However, neither rooftop nor utility-scale solar were selected as part of EWEB's portfolio in the 2023 IRP reference case scenario analysis. Why not?

EWEB's peak energy needs are in the winter and will likely remain that way for several decades.

In Western Oregon, the highest energy demands are driven by extreme cold fronts that can last weeks as people use their electric heaters nonstop. While the impacts of climate change do indicate warming trends with summer air conditioning use anticipated to grow in the coming decades, those changes will be slow. EWEB accounts for annual variations in load in our planning, and we forecast that rising summer demand will remain within those variations for several decades. Even the highest recorded summer loads, including the heat dome of 2021, were 50 MW, or 10%, less than EWEB's average peak winter loads. They were about 150 MW, or 25%, less than the highest winter loads of the last decade.



This chart shows the annual shape of EWEB's energy needs compared to solar generation. EWEB's greatest demand (dotted black line) is highest in the winter when solar output is the lowest (orange and yellow lines).

Solar resources contribute very little energy when we need it the most.

Solar panels generate less than 10% of their maximum capacity during these peak winter events because the days are short and cloudy. Even if EWEB invests in solar capacity, we will still need to procure other resources to meet winter needs. In general, when a resource's generation doesn't align with load, that energy is wasted unless EWEB is able to sell surplus to other parties. As more solar generation is connected to the Northwest grid and solar imports from California and the desert Southwest increase, the value of surplus solar energy is expected to drop[1].

[1] Baseline Conditions Buildout (nwcouncil.org)

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The reference case scenario selected wind as one of the best fits for EWEB.

EWEB's IRP reference case modeling selected wind resources with winter-peaking profiles as one of the least-cost options to meet EWEB's needs. While production from these wind facilities is variable, they are more likely to generate during seasons and peak events when EWEB's energy needs are the greatest. The primary risk for these resources is whether transmission capacity will be available in the future to bring energy from wind farms east of Cascade Mountains into Eugene. EWEB staff are planning to examine the impacts of transmission availability and cost in future analysis.

Utility-scale solar farms in eastern Oregon are more cost-effective than local solar projects.

More abundant sunshine and economies of scale make solar energy from large projects in Eastern Oregon cheaper per megawatt-hour than local resources. Even with incentives, local solar is among the most expensive resources available to EWEB, due to lower local sun exposure and higher build costs when compared to utility-scale solar east of the Cascade Mountains. If EWEB chooses to get energy from more expensive sources, then EWEB customers have to pay higher rates. Keeping rates lower can impact the rate of electrification and other customer-driven activities that have climate impacts.

Resource Cost Comparison

Resource Category	Resource Type	Levelized Cost of Energy $/MWh	Cost of Winter Peaking Capacity $/kW-mo	Transmission Risk/Cost
Wind	MT/WY Wind	22	16	High
	Northeast OR Wind	29	22	Moderate
Solar	Residential Rooftop Solar	196	451	-
	Community Solar	69	161	-
	Utility Solar (Eastern OR)	28	51	Moderate
BPA	BPA Contract (Slice & Block)	33	18	Low

Our values help inform resource choices.

EWEB's mission is to provide reliable, affordable, and environmentally responsible energy to meet our customers' needs. EWEB's Board is committed to balancing the tradeoffs between different resource options and using community dollars efficiently and effectively. To the extent that solar helps meet summer needs, which will likely grow over the coming decades, or fulfills other community values, it may become part of EWEB's future portfolio.

The tradeoffs of local solar, particularly its high cost and low contribution to meeting winter needs, will need to be considered against the benefits it provides (reduced environmental impact and local control). EWEB is committed to facilitating customers' choice to invest in solar and other resources, and will continue to update rate designs and incentives to support customers while minimizing unwanted impacts or cost-shifts.

EWEB's current approach to local solar

Some EWEB customers are interested in rooftop solar as an option to advance clean, local energy and provide resiliency during emergencies or outages. At the same time, customers with distributed solar resources are still connected to EWEB's grid. These customers rely on EWEB for energy at night and during the winter when their panels aren't producing. They also rely on EWEB's distribution and transmission lines when they sell surplus energy back to EWEB.

As a matter of principle, EWEB believes that costs should be equitably shared among all customers. EWEB incurs significant costs to maintain a robust distribution system and procure energy for all customers, even those with distributed generation technologies. Because EWEB currently collects revenues for transmission and distribution (delivery charges) based on usage, net-metering policy design can result in under-collection of funds from customers with distributed generation. For this reason, EWEB will continue to evaluate and update its rate designs and distributed generation policies to ensure that these align with EWEB's values and principles.

Net-Metering Incentives

To support local solar resources, EWEB currently offers solar incentives and net-metering rates. Net-metering is the practice of crediting solar generation from a customer to 'roll back' the meter on the amount of energy a customer uses each month. A customer who generates more electricity than they consume each month will receive a billing credit for that excess energy. All EWEB customers are paying solar owners for the surplus energy rooftop panels generate. This compensation is based on a "Renewable Net-Metered Rate" published by EWEB annually and is currently slightly lower than EWEB's residential retail rate.

EWEB's principles for distributed generation, such as rooftop solar, include:

- EWEB *supports and facilitates customer choice* to install non-utility owned distributed generation equipment and infrastructure.
- EWEB recognizes that *some distributed generation technologies are better at meeting the community's historical electricity demand* (load) than others.
- EWEB supports *pricing mechanisms that fairly compensate customers* for electricity they supply to the grid and that do not transfer unpaid costs to other customers.
- EWEB strives for the *equitable allocation of costs among all customers* to maintain the electric grid.
- EWEB will need to pursue rate designs that *fairly assign the costs of procuring energy* (including peak energy needs) and maintaining the electric grid to the customers who cause those costs.
- EWEB *prioritizes the safety of utility workers and customers* and will develop interconnection standards that ensure safety and reliability.
- EWEB prefers policies that *incorporate concepts of environmental justice and equity* and seek to avoid or mitigate negative impacts to disadvantaged communities.

Distributed Generation

Distributed generation is small-scale power supply technologies or resources that are located at or near the location of consumption (e.g. a house or business park). Distributed generation technologies include solar panels, batteries, and gas or diesel generators, among others.

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EWEB rooftop solar quick facts

1. The current installed capacity of rooftop solar in EWEB's service territory produces about 0.4% of EWEB's annual needs.
2. To help customers make more informed decisions as they explore their solar options, EWEB requires new solar projects to have at least two bids and be installed by contractors approved by the State of Oregon.
3. EWEB offers a residential solar incentive of up to $2,500 and commercial incentive of up to $12,500 for qualified projects, voluntarily funded by EWEB customers participating in the Greenpower program.
4. In 2022, the residential average size of a solar array was 7.2kW with a cost of $4.67 per watt in EWEB's service territory. This data comes from solar installations that are paired with battery storage units; costs are not fully representative of stand-alone solar systems. The cost and system size are based on AC output watt and not nameplate.
5. The average simple payback period for residential solar in EWEB's service territory can be over 25 years, not including loan costs. This may be longer than the typical useful life of the solar equipment (panels and/or inverters) which are designed to last on average 25 years. Additionally, the age and expected remaining life of the roof may also affect the useful life of the solar panels.

EWEB rooftop solar by the numbers

- 2022 Customer Solar Projects Receiving EWEB Incentives: 88
- Total Customer Solar Projects Receiving EWEB Incentives (2001-2022 Present): 849
- 2022 Customer Solar Nameplate AC Output Watt Capacity Installed: 1,395 kW
- Total Customer Solar Nameplate AC Output Watt Capacity Installed (2001-2022 Present): 9,476 kW
- Estimated Annual Customer Solar Production: 9,675,534 KWh (1,105 kWa)

Visit EWEB's website for more information: www.eweb.org

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