

Western Utility Coordination Efforts Board Learning Paper

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There are several ongoing efforts in the West to improve how utilities coordinate with one another in planning and operations. These efforts are in various stages of development or operation, and all generally aim to provide efficiencies and assist with the transition of the electric grid, including the implementation of clean energy policies. These efforts will impact Oregon and its utilities over the coming years, though the precise outcome is highly uncertain.

This paper reviews the many Western energy market and regional collaboration efforts and previews potential outcomes. It also considers what changes might mean for Energy Trust, including potential impacts to the value of energy efficiency in Oregon.

Introduction

The electricity landscape in the West is changing rapidly due to the adoption of clean energy policies and the competitiveness of clean technologies. These changes and the challenges they present for the grid have led Western utilities and other stakeholders to evaluate a host of different ways to improve collaboration and the sharing of resources across some of the regulatory and institutional barriers that exist. Coordination between utilities allows for more efficient utilization of resources and transmission to reliably meet electricity demand. Regional collaboration in planning and operations is especially valuable for systems with large amounts of variable renewables because it allows utilities to make use of renewable resource diversity over much larger areas than their individual footprints.

Many regions of the country have achieved this type of widespread collaboration through the development and operation of organizations known as Independent System Operators (ISOs) and Regional Transmission Organization (RTOs)¹. The West has experienced many failed efforts to establish a large-scale ISO or RTO; the only existing organization of this nature in the West, the California ISO or CAISO, has unique governance challenges that have prevented it from expanding across the region.²

In recent years, the West has seen successful efforts to establish some of the services that ISOs or RTOs offer, but on a more incremental basis. At present, there are numerous efforts that appear to be on a successful path to further expand the way utilities coordinate on a regional basis.

Regional Collaboration Efforts in the West

Western Power Pool's³ Western Resource Adequacy Program (WRAP)

WRAP Purpose: Deliver a region-wide approach for assessing and addressing the adequacy of electricity generation resources to improve reliability, enact consistent rules and reduce the amount of generation resources necessary to serve load.

WRAP is a first of its kind Resource Adequacy (RA) program designed to meet the unique needs of the West.⁴ The program enables participants to share resources to reliably meet the combined demand across the program footprint. This collaboration leverages load and resource diversity to ensure resource adequacy with fewer resources than would be needed if each participant relied only on their own resources to meet their own load. It also creates a single, consistent set of RA program rules across participants. Bonneville Power Administration (BPA), PacifiCorp and Portland General Electric are participating in WRAP.

WRAP has been approved by the Federal Energy Regulatory Commission (FERC) and is currently working toward its first non-binding season of participation. Once WRAP becomes binding, there will be financial penalties for participants who do not meet the requirements of the program. WRAP includes a Forward Showing Program, which occurs seven months in advance

¹ The terms ISO and RTO effectively represent the same concept and this paper uses them interchangeably. The general concept will be called an "RTO," but it is important to understand that entities like the California ISO provide the same services and functionality as an RTO.

² Specifically, CAISO's current governance structure, which includes a Board of Governors appointed by the California Governor and confirmed by the California State Senate, is problematic for utilities that are not within California to join and has led to the development of creative governance structures for other services CAISO offers, including the creation of the Western Energy Imbalance Market (WEIM) Governing Body.

³ Western Power Pool, formerly known as Northwest Power Pool, provides programs and services to coordinate utility operations in the West.

⁴ <https://www.westernpowerpool.org/about/programs/western-resource-adequacy-program>

of a given season, as well as an Operational Program. Energy efficiency contributes to the program to the extent that it affects the utility's forecasted load. While the timeframe of the Forward Showing Program is much shorter than the planning horizon in utility Integrated Resource Plans (IRPs), there are ongoing efforts to consider how WRAP participation might be reflected in IRPs to ensure the benefits of regional collaboration are reflected in planning decisions. In Oregon, the Oregon Public Utility Commission is considering participation in WRAP as an alternative to shorter-term yet-to-be-adopted state-level resource adequacy requirements (Docket UM-2143).

Real-Time Energy Markets: CAISO's Western Energy Imbalance Market (WEIM) & the Southwest Power Pool's⁵ (SPP) Western Energy Imbalance Service (WEIS)

Real-Time Energy Market Purpose: Allow participants to efficiently trade energy resources in real-time to provide cost savings, support renewable integration and improve reliability.

Real-time energy markets facilitate energy transactions *within* the operating hour. While these markets only account for roughly 5-10% of all energy transactions, they can be especially helpful for integrating renewable resources, which can ramp up and down quickly. Real-time energy markets, like CAISO's WEIM and SPP's WEIS, increase the size of the footprint and the diversity of resources over which intrahour balancing occurs. CAISO's WEIM became operational in 2014 and its participants make up roughly 80% of the load on the Western electrical grid, including most of Oregon. Some of the remaining entities in the West (primarily in Colorado and parts of Wyoming) participate in SPP's WEIS.

Despite limitations to the scale of these real-time markets, due to factors like transmission and resource commitment and scheduling decisions, both of these markets have provided significant economic benefits from the more efficient sharing of generation across a broader footprint and the avoidance of renewable curtailment. For instance, WEIM has avoided more than 2.1 million MWh of renewable curtailment in CAISO, allowing what is likely mostly solar generation to be used to serve load outside of the CAISO footprint rather than be wasted.⁶ Additionally, these markets, which have been in operation in the West for nearly a decade, have provided participants with experience in organized wholesale markets. This, in turn, has created additional comfort with their structure and an interest in expanding the reach and functions of energy markets, including to a day-ahead function discussed below.

Day-Ahead Energy Markets: CAISO's Extended Day-Ahead Market (EDAM) and SPP's Markets+

Day-Ahead Energy Market Purpose: Build on the benefits of real-time markets by allowing participants to coordinate and economically schedule and commit supply to meet expected demand in the day-ahead timeframe.

Both the CAISO and SPP have proposed new "day-ahead market" constructs in the West. Day-ahead markets build on the benefits observed in real-time markets by facilitating coordination between participants into the day before operations, when operators make most scheduling and commitment decisions. Day-ahead markets can provide economic, reliability and environmental

⁵ Southwest Power Pool is the RTO in the Central US.

⁶ See the CAISO's *WEIM Benefits Report: Third Quarter 2023*, Table 7, available here: <https://www.westerneim.com/Documents/iso-western-energy-imbalance-market-benefits-report-q3-2023.pdf>

benefits through joint scheduling across a region, without adopting all of the requirements of an RTO. Standalone day-ahead markets (outside of an RTO) are not yet operational in the West but are in various stages of development and regulatory approval. CAISO's Extended Day-Ahead Market (EDAM) proposal was recently approved by FERC.⁷ And SPP's Markets+ is nearing a tariff filing with FERC in early 2024. Both markets are currently targeting being operational in 2026.

The concept of a day-ahead market, in the absence of a more complete RTO, has not yet been tested in operation. But it has been under discussion and development by the market operators, utilities and other stakeholders for years and has been designed to meet the unique needs of the West, including greenhouse gas (GHG) accounting for state policies that place a price on carbon emissions from electric generation. Each day-ahead market has proposed its own, slightly different, mechanism for addressing GHG costs for programs that place a cost on GHG emissions (such as California and Washington's programs). Both markets may also consider, at a later date, how to accommodate GHG and clean energy policies for states like Oregon, which do not currently subject utilities to carbon prices. The implementation of both policies to address GHG pricing and non-pricing programs within the day-ahead markets may impact market prices observed in these day-ahead markets.

Regional Transmission Organizations (RTOs): SPP's RTO-West and Other Potential RTO Structures

RTO Purpose: Provide reliability and economic benefits through broadly enabling coordination across the footprint, including economic optimization of resources, maximizing use of transmission, planning for future transmission needs and jointly coordinating resource adequacy.

RTOs can offer additional benefits beyond those offered by real-time and day-ahead markets. To unlock the full benefits of regional coordination, RTOs involve jointly agreed upon rules for functions that extend beyond electricity market operation, for example resource adequacy, long-term transmission planning, and transmission cost allocation. In the West, there have been many failed efforts to stand up new, large RTO footprints, but recent state legislation (for example in Colorado and Nevada) and interest from utilities has renewed the push to form an RTO in the West. One effort, SPP's RTO-West that would be concentrated in parts of Colorado and Wyoming, is planned to be operational by mid-2026. There is also interest in expanding CAISO's services across the region, through transitioning CAISO into a western RTO, though this transition would require changes to CAISO's current governance structure.⁸

Potential Outcomes

While there is broad interest in building on the existing regional collaboration efforts and energy markets in the West, there is significant uncertainty around how the various – and in some cases competing – efforts will shake out over the next several years. The next six to 12 months may be critical in determining the footprints for day-ahead markets in the West, as various utility participants may make decisions committing to one market or another. For example, BPA is currently in the midst of a public process that will likely determine its market direction. And these decisions could reverberate into other market developments (including impacting the footprint of

⁷ On December 20, 2023, FERC approved CAISO's proposed EDAM tariff filing (in Docket ER23-2686) with one exception related to a proposed transmission revenue recovery mechanism. Early in 2024, CAISO will begin work on a revised proposal to address this issue.

⁸ A group of state regulators recently issued a letter proposing creation of a new, independent entity which might allow for regional market formation to include the CAISO footprint. Efforts are early and the structure is still being developed. Additional information can be found here: <https://www.westernenergyboard.org/wwgpi/>.

the current real-time markets in operation in the West). There is interest from some stakeholders in influencing the market decisions that will be made by individual utilities given the impact those decisions could have across the region. While there are some predictions around how energy markets and footprints might develop, there is little certainty and significant interdependencies of decisions between potential market participants that a range of outcomes is possible.

Western energy markets and regional coordination are in a time of dynamic change and Oregon and its key participants will be central in determining the broader landscape across the West. All major load serving entities in Oregon have joined the WRAP. The date they will make their participation binding (subject to financial penalties for non-compliance) is likely to occur in 2027-2028. Additionally, all major load serving entities in Oregon participate in a real-time energy market, specifically the CAISO-operated WEIM. However, there are potentially diverging interests for day-ahead market participation by Oregon utilities. PacifiCorp has announced it will participate in the CAISO's EDAM. However, other entities in Oregon are still considering their choices. BPA is hosting a day-ahead market workshop process with the hopes of issuing an indication of which day-ahead market it may join in early to mid-2024.

It is important to understand that utility participants that participate in a day-ahead market must also participate in that same market's real-time structure. Thus, should any participant in WEIM choose a day-ahead market operated by a different market operator (e.g., a WEIM participant chooses to join Markets+), they will need to exit the real-time market they are currently in and move to the real-time market that is part of the day-ahead market they have elected. If Oregon entities opt to move into another day-ahead market, there is the potential for lost benefits from the wide footprint and diverse resource set offered through the WEIM.

What This Means for Energy Trust

Utilities could target energy-efficiency measures that support needs for the broader system.

Improved regional coordination through the expansion of markets and development of regional programs like WRAP will likely impact the value that energy-efficiency measures bring to Oregon customers. In principle, the value of energy-efficiency measures within regional markets and programs should reflect regional needs in addition to individual utility needs. For example, the value of a space heating efficiency measure in a winter-peaking utility might drop if that utility is able to coordinate planning and/or operations with utilities that are summer peaking and have excess resources available in the winter. In this case, coordination may provide a lower cost solution to challenges that might otherwise be solved through an efficiency measure. In other cases, coordination may reveal new opportunities for efficiency measures to support the regional grid more broadly. For example, regional coordination might spur the winter-peaking utility to pursue more space conditioning efficiency measures than they otherwise would to support the regional grid during periods of stress in the summertime.

Regional market development and coordination activities are unlikely to materially impact small/customer-owned renewables, as development of these resources is usually driven more by local factors than regional market dynamics.

The impacts on energy efficiency cost-effectiveness will depend on how utilities treat regional markets and coordination programs within their IRPs.

It is well understood that achieving decarbonization while maintaining reliability and affordability will require utilities to coordinate with one another to leverage load and resource diversity across the region. Studies have shown that energy efficiency remains a key pillar of decarbonization

even when coordination challenges are overcome.^{9,10} Regional coordination and expanded energy efficiency are, therefore, companion solutions that are both needed to achieve the goals of policies like House Bill 2021 in Oregon.¹¹ However, traditional cost-effectiveness analysis may instead frame these solutions as competitive with one another. For example, it has been shown that access into California markets with periods of excess solar generation lowers market prices in the Pacific Northwest. Under a traditional cost-effectiveness framework, this may lower the perceived value of energy efficiency. However, when viewed more holistically, energy efficiency in the Pacific Northwest reduces the total amount of renewables needed in the West to achieve GHG reductions. Regional coordination can – but will not necessarily – help facilitate this more global view.

At its best, regional market and program expansion could help to target energy-efficiency measures that support a more globally optimal solution for the region and distribute those benefits fairly to participating utilities and their customers. Whether regional coordination realizes this potential for Oregon customers will depend not only on regional market and program design, but also on how Oregon utilities account for regional markets/programs and energy efficiency in their IRPs and energy-efficiency avoided cost calculations. Realizing the full value of energy efficiency in the context of regional markets and regional programs may require modifications to these practices as markets and programs develop. For example, targeting energy-efficiency measures to account for regional needs may require utilities to consider how WRAP participation affects the capacity contributions of those measures in their IRP analysis. The value of energy efficiency in Oregon may also be affected by how markets reflect GHG and clean energy policies across the footprint. Depending on how they are designed, policy-based seams in carbon pricing or carbon accounting could make it more challenging to realize the full value of energy efficiency across the region as a whole.

Efficiency measures that enable demand response and load flexibility may be significantly impacted by market expansion.

The expansion of markets in the West could also unlock new opportunities to expand demand response and load flexibility. Depending on market rules, it may be easier to monetize the benefits of demand response and load flexibility programs and energy efficiency measures that enable load flexibility could see greater market value. Market expansion could also bring demand response aggregators into the space, which could accelerate adoption of demand response in Oregon. But this would complicate the demand-side management landscape and potentially increase coordination challenges between Energy Trust and organizations that pursue demand response.

Fractured market development is possible and could impact the value of energy efficiency.

Various papers have pointed out that more geographically diverse and comprehensive market structures lead to lower costs and better support clean energy policy goals.¹² The opposite is also true – that smaller or less geographically diverse and less comprehensive market constructs can create or retain barriers to renewable diversification and decarbonization. A system with two different day-ahead market footprints will have more market inefficiencies than a single market that encompasses both footprints. The benefits of market expansion will be limited under this

⁹ See for instance E3, “Deep Decarbonization in a High Renewables Future: Updated Results from the California PATHWAYS Model,” California Energy Commission, CEC-500-2018-012, June 2018. Available at: <https://www.energy.ca.gov/sites/default/files/2021-06/CEC-500-2018-012.pdf>.

¹⁰ See for instance Evolved Energy Research, “Exploring Pathways to Deep Decarbonization for the Portland General Electric Service Territory,” Portland General Electric 2019 IRP External Study A, April 2018. Available at: <https://downloads.ctfassets.net/416ywc1laqmd/6KTPcOKFILvXpf18xKNseh/271b9b966c913703a5126b2e7bbbc37a/2019-Integrated-Resource-Plan.pdf>.

¹¹ HB 2021 establishes requirements for Portland General Electric and PacifiCorp to reduce the GHG emissions associated with meeting Oregon load by 80% in 2030, 90% by 2035, and 100% by 2040. Among other requirements, HB 2021 also requires those utilities to consider impacts (including environmental, health, and economic impacts) to environmental justice communities in their plans.

¹² See for instance the *State-Led Market Study: Market Regulatory Review*, prepared by Energy Strategies, July 2021, available here: <https://www.energystrat.com/s/Final-Roadmap-Market-and-Regulatory-Review-Report-210730.pdf>.

scenario and the value of energy-efficiency measures may depend on the footprint of the market in which the utility participates. Some measures, which help mitigate the increased costs or emissions associated with remaining market inefficiencies, may see more value. For example, if one footprint is winter peaking and the other summer peaking, the former may pursue heating efficiency measures while the latter pursues cooling efficiency measures. The best solution for the region may involve pursuit of both heating and cooling efficiency measures in *both* footprints, but limits to coordination may obscure this insight.

Ultimately, impacts to energy efficiency in Oregon will depend on which markets Oregon utilities choose to participate in (if any), how those markets are designed, and how the utilities evolve their IRP analysis and energy-efficiency avoided cost calculations in response to those developments. This is a dynamic time with respect to both regional markets and energy-efficiency analysis – all of these topics are the subject of ongoing discussion at both the state and regional level. Achieving good outcomes for customers will require continued thoughtful dialogue and adaptability on the part of organizations like the Energy Trust.