

Renewable Resources and Transmission in the West: Interviews on the Western Renewable Energy Zones Initiative

WREZ Phase III Report to the Western Governors: Executive Summary



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The Western Renewable Energy Zones (WREZ) initiative aims to develop areas with abundant, high-quality renewable resources in the Western Interconnection – WREZ “hubs” – and establish an efficient network of interstate transmission lines to deliver the energy to load centers. The map in the centerfold of this report shows the WREZ hubs and existing transmission lines, as well as the 2022 Common Case Transmission Assumptions (CCTA) and other proposed lines used in regional transmission planning.¹ While some of these lines will reach WREZ hubs, most will remain inaccessible. Continued isolated procurement by individual utilities will not lead to major development of these renewable-rich areas and the requisite transmission.

The West has a long history of collaboration on thermal power plants and transmission. But renewable resources are different. They typically can be developed in small increments and short timeframes, so the drivers for joint development in the past – mainly sharing the cost and risk of large, capital-intensive projects – may not be in play.

Still, coordinated resource procurement – joint solicitations or simply aligning timing and potentially locations for resource procurement – could support WREZ development. Retooling the West’s traditional collaborative model could achieve economies of scale and a critical mass of transmission needs in the same timeframe that utilities acting alone cannot achieve.

The Western Governors’ Association (WGA) commissioned interviews with 25 utilities, 11 public utility commissions (PUCs) and two provincial energy ministries to learn their views on potential collaboration to develop WREZ hubs. The interviews also collected important contextual information on resource planning and procurement, as well as transmission planning and development. In addition, WGA solicited opinions on market mechanisms to support development of higher levels of renewable resources in the West, next steps for the WREZ initiative, and issues of interest for regional discussion.

This report details the results of the interviews and the modeling that kicked off the discussions, with additional information provided for context. To allow for frank discussions, interviewees were advised that results would be presented in aggregate with exceptions, such as the utility’s preferred renewable energy zones. Following are key findings summarized from the first five chapters of this report. Chapter six presents interviewees’ recommendations on possible next steps for the WREZ initiative and issues of interest for regional discussions.

¹Common Case Transmission Assumptions were called “foundational” lines in the Western Electricity Coordinating Council’s (WECC’s) 10-Year Regional Transmission Plan for 2020. Differences in lines assumed for the 2022 plan are the result of changing circumstances. See Chapter 3 for a discussion of foundational lines. For the 2022 transmission plan, see “TEPPC 2022 Common Case Transmission Assumptions” (slides 20 and 22), Dec. 9, 2011, http://www.wecc.biz/committees/BOD/TEPPC/20111209/Lists/Presentations/1/111209_2022CCTA_PPT_RTEPWEBINAR.pdf

*The full report is posted at <http://www.westgov.org/rtep/219-western-renewable-energy-zones>

Key Findings

Preferred Renewable Energy Areas

- **In many cases, the utilities' preferred renewable energy areas are not in sync with resources determined to be most economic by WREZ modeling** (Table 4 and Table 5). By design, the model makes its selections only from areas with high concentrations of high quality resources. The model does not consider constraints on resource location under state renewable energy requirements. In addition, the difference in adjusted delivered cost of energy for wind vs. solar is within the model's margin of error for some combinations of WREZ hubs and load centers. After cost, utilities cited availability of transmission to deliver energy to load centers as the most important reason for the utilities' preferred renewable energy areas.
- Some **16 WREZ hubs are of interest to utilities that together serve multiple states** (Table 6).

Resource Planning and Procurement

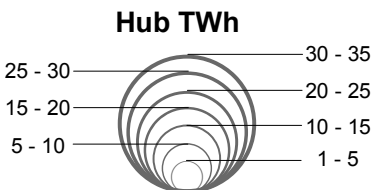
- **Utilities are focused on developing renewable resources in or close to their service areas.**
Among the reasons is that resources close to load may not require new high-voltage transmission and, therefore, are easier to develop in a more incremental manner. Even where transmission capacity is available, the economics of distant, higher quality resources may be ruined by pancaking of charges – purchasing transmission service separately from each provider whose lines the power crosses to reach loads. Furthermore, renewable energy requirements in many states, enacted in part for economic development, limit out-of-state acquisitions. In-state resources also are a more obvious nexus with state public interest standards for siting and cost recovery, reducing development timelines and risk for utilities.
- **Utilities serving states without aggressive renewable energy requirements find it unlikely that they will be required to meet a 33 percent renewable resource target in the next 10 or 20 years.**
- **Utilities generally are uncertain about the point in time when they might access distant, high-quality resources,** rather than rely on closer sites even if they are lower quality. One utility said it has already reached this crossover point, with some projects requiring up to 100 miles of radial transmission to be cost-effective today. Another said the crossover point could occur in one year or 10 years in the future, depending on the cost of resources that bid into its solicitations. Some utilities do not see a crossover point occurring in the next 10 years, if at all.
- **Utilities are not interested in resources from WREZ hubs unless transmission to the hub already exists or there is a high degree of certainty for the timely completion of transmission to the hub.**
- **Diversifying the types of renewable resources acquired is an increasingly important driver for utility resource selection,** particularly with increasing levels of variable energy resources and related integration concerns.
- **Inconsistent and uncertain state and federal policies pose a barrier to efficient development of renewable resources, according to the utilities interviewed.** Commonly cited examples include differing renewable portfolio standards (RPS), changes in an individual state's RPS policies, and failure to establish stable federal tax credits. In addition, varying requirements for siting transmission facilities across state and provincial boundaries drive up the complexity, timelines, cost and risk for accessing out-of-state resources.
- Utilities and most state regulators interviewed believe **in-state preferences for renewable resources should be eliminated in order to create a level playing field** where the market would signal efficient investments and allow utilities to access the cheapest resources over a larger geographic area.

- **The complexity and length of resource planning and procurement processes do not match the short timelines for developing renewable energy projects**, making it difficult to take advantage of time-limited opportunities.
- **Utilities are increasingly wary of making investments in renewable resources and transmission in advance of the need for meeting RPS targets** – or in anticipation of additional transmission service requests – without strong indications that regulators will grant full cost recovery.
- **“Regulatory lag” – the amount of time between utility cost recovery and expenditures – is a fundamental issue for utilities for renewable resource and transmission development.** In jurisdictions without provisions to address this concern, utilities may be reluctant to invest in long lead-time and capital-intensive projects.
- **Utilities largely do not specify the type or location of renewable resources in their resource plans or resource solicitations.** Instead, they rely on results of competitive processes to determine characteristics of resources procured.
- **Nearly all utilities believe the cost of generation from renewable resources will continue to trend downwards**, both for distributed and utility-scale generation. They also believe utility-scale generation will continue to be less costly than customer-sited distributed generation.
- **About one-quarter of the utilities interviewed include the potential impact of future carbon regulation in their resource planning or procurement processes. About half also model the potential impact of criteria air pollutants.** The dominant view is that while carbon regulation and increasingly stringent RPS requirements may increase the levels of renewable resources utilities acquire, the location of these resources would remain largely unchanged.
- **Utilities are just beginning to consider how smart grid technologies, reductions in thermal plant operations and intra-hour transactions might free up transmission capacity.** Some utilities said there are insufficient drivers to develop renewable resources to take advantage of freed-up transmission capacity on existing lines, or the amount of capacity may not be large enough to affect development.

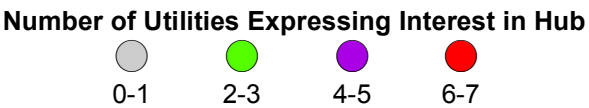
Transmission Planning

- **Most utilities said they have adequate transmission arrangements in place to meet current renewable energy requirements over the next 10 years** assuming anticipated loads and continued resource development close to their service areas.
- **Transmission options are not thoroughly evaluated in integrated resource planning (IRP) processes, and most jurisdictions do not require utilities to submit separate transmission plans for review.** Meantime, resource plans have limited influence on transmission plans. The time horizon for the IRP action plan for near-term activities to acquire the identified resources is short, and competitive bidding is more determinative of actual resource acquisition and transmission needs.
- **By and large, revised Federal Energy Regulatory Commission (FERC) requirements have alleviated earlier restrictions on communication within the utility that created roadblocks to coordinated transmission and resource planning.** Still, some transmission planners are unable to communicate with resource planners to the extent they would like and feel limited in taking proactive roles.
- **“Foundational” lines in WECC’s 2020 transmission plan (called Common Case Transmission Assumptions for the 2022 plan) – those assumed to have a high likelihood of being built over the next 10 years for the purpose of regional transmission planning – will affect where many of the utilities acquire renewable resources.** However, these lines will have little influence on

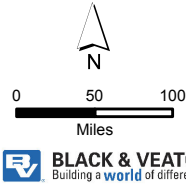
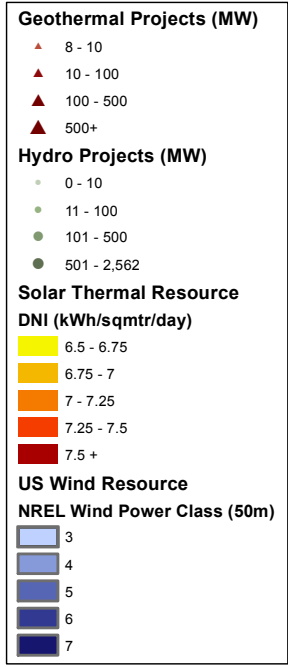
WREZ Hub Utility Interest
January 2012



CCTA 2022 Transmission



Zone	AZ_NE	AZ_NW	CA_SO	ID_EA	ID_SW	NV_EA	NV_NO	NV_SW	OR_NE	OR_SO	OR_WE	UT_WE	WA_SO	WY_EA	WY_EC	WY_NO	WY_SO	CO_NE	CO_EA	CO_SE	CO_SO	NM_CT	NM_EA	NM_SE	NM_SO	NM_SW	TX
PG&E																											
SMUD																											
SCE																											
SDGE																											
IID																											
APS																											
SRP																											
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Tri-State G&T																											
CSU																											
Pacificorp																											
PGE																											
EWEB																											
Avista																											
PSE																											
Seattle																											
Tacoma																											
Idaho Power																											



resource acquisition decisions for the rest of the utilities interviewed for a variety of reasons, including adequate local resources to meet state renewable energy requirements.

- **Several utilities expect some of the additional planned (“potential”) lines to be completed in the same timeframe as the foundational lines and affect their acquisition of renewable resources** (Table 10).
- According to respondents, **subregional planning groups play an important facilitative role in bringing together utilities and other stakeholders to share information and identify common needs and may serve as a forum for coordinating WREZ development.**
- **Generally utilities do not believe that subregional or regional planning for renewable resources is necessary for developing transmission to WREZ hubs, beyond the work done in transmission planning forums.** Government officials expressed more support for this concept.
- However, **utilities and government officials recommend that subregional planning groups identify optimal transmission build-outs to WREZ hubs of common interest, rather than focus solely on system problems such as congestion.** Government officials also recommend that subregional planning groups identify anchor tenants, increase involvement of state decision-makers, coordinate with utility personnel that approve resource procurement and create 20-year plans to achieve long-term carbon reduction goals.

Transmission Development

- **Two-thirds of the utilities interviewed say state policies or regulations impede development of interstate transmission.** Key areas of concern are local siting processes, inconsistent siting standards across borders and cost recovery risk. PUCs and provincial energy ministries cited the following hurdles: demonstration for a given state that a line is needed and will serve the public interest, lack of eminent domain authority, multiple uncoordinated approvals required by various levels of government and cost recovery processes.
- **Most PUCs find it difficult to approve a line sized beyond (1) the definable future needs of their retail customers and (2) the needs of transmission customers with signed service agreements.** Statutory or regulatory changes may be needed to overcome barriers in transmission permitting and cost recovery processes to allow for right-sizing – building some level of transmission in advance of need to account for long-term demand, develop WREZ hubs and minimize the need for additional transmission corridors and associated environmental disruption.
- **While utilities and regulators were nearly universal in their support of the open season approach to amass financial support for transmission projects, it likely is insufficient to develop long interstate lines to WREZ hubs.** The chicken and egg problem remains: Generators will not make financial commitments for transmission absent a power purchase agreement with utilities, which will not sign such agreements absent transmission assurance.
- Many jurisdictions have express policies to develop facilities for export for economic development purposes. However, **the framework for reviewing the public purpose of a proposed transmission line for siting and cost recovery in most states does not address the economic benefit to the state of exporting resources.**
- **Most utilities said the institutional structure in place in the West is adequate, or can be adapted, to successfully develop transmission to WREZ hubs.** However, some utilities believe institutional and legislative changes are needed, including regional coordination of market functions and a clear long-term signal on environmental priorities.

Coordinated Resource Procurement

- Some utilities believe cooperation may be required to develop resources in distant WREZ hubs and associated transmission.
- Utilities generally favor joint development and ownership over joint solicitations or coordinating separate solicitations. Most utility regulators are supportive of pursuing any of these approaches.
- Many utilities pointed out that **regulations for resource planning and procurement do not anticipate joint or coordinated solicitations** and believe changes would be required to accommodate these approaches.
- **Transmission has greater potential for cooperation than renewable resource procurement, according to many utilities.**
- **Most utilities feel comfortable with the general concept of coordinated resource procurement if there's a shared need** – for example, to spread cost and risk, to share excess capacity, to comply with renewable resource mandates, to meet load and to support system reliability. **At the same time, utilities prefer to develop renewable resource projects independently given typical sizes and modular construction.** Exceptions to this view are where utility partnership reduces risk exposure and helps reach critical mass for economic development and operation, as may be the case for concentrated solar power and geothermal projects. New technologies such as wave energy also pose risk that may best be shared across a group of utilities.
- Beyond shared needs, utilities say **concrete commitments for coordinated resource procurement require a framework for developing renewable resources for export to distant load centers, and in some cases stricter renewable energy standards or carbon regulation.**
- **A number of factors affect whether utilities will partner with one another,** including proximity to each other's service areas, to the targeted resource area and to available transmission from the resource area; availability of local resources that dampens interest in more distant resources; similar ownership structure and management philosophy; mutual membership in an association or subregional planning group; a history of cooperation between the utilities; utility size; and similarities or differences in regulatory requirements.
- **Regulators are largely supportive of cooperative utility projects,** particularly to spread cost and risk across multiple parties and to aid in construction of transmission lines that cross jurisdictions. They see no major barriers to coordinating procurement across utilities, at least to align the timing of separate utility requests for proposals (RFPs) for the same resource locations.
- **Timing may be a significant issue for coordinated resource procurement,** including aligning resource planning and procurement cycles – especially with a utility in another state – and the lag between resource solicitations and transmission development.

Market Mechanisms to Aid Renewable Resource Development

- **Nearly all government officials interviewed for this report expressed support for increased trading of renewable energy credits²** for RPS compliance, in order to reduce the amount of transmission that needs to be built and the associated cost. However, they noted restrictions on this practice today and the difficulty in changing them. Some states raised concern that their native

²Renewable energy credits, also called renewable credits (or certificates), represent the environmental and other non-energy attributes of one megawatt-hour of electricity from a renewable energy generating unit. "Tradable" (or "unbundled") credits represent only the renewable and environmental attributes, which are sold separately from the underlying energy resource. Definitions of these attributes, including any emissions reductions, vary by state.

resources may lose out to cheaper resources elsewhere or that transmission constraints would strand renewable energy, which would be displaced by more expensive resources.

- While **regulators generally support steps to reduce the cost to consumers of integrating variable wind and solar generation (e.g., intra-hour transmission scheduling and generation dispatch)**, they want to know the specific costs and benefits for the utilities serving their customers. For any market mechanism that functions at a subregional or regional level, regulators also want to understand the potential implications of the choice of market operator.

Recommendations

Following are recommendations based on these findings for consideration by states, provinces and regional bodies:

1. WGA should host trial discussion groups of utilities and regulators in 2012 to explore resource development and interstate transmission for WREZ hubs of common interest to utilities whose service areas jointly encompass multiple states, particularly where transmission is not available and where planned transmission is at risk. The goal is a comprehensive approach to developing these zones and identified transmission corridors. Other stakeholders should receive reports on the discussions and be brought into the process as it progresses. Transmission planning work by the Western Electricity Coordinating Council (WECC) and its Environmental Data Task Force and the Western Governors' Wildlife Council should be considered in the WREZ discussion groups, including potential transmission alternatives and configurations for long-term planning scenarios that consider environmental and cultural resources.
2. The Resource Planners Forum hosted by WECC and the Western Interstate Energy Board (WIEB) in 2012 should discuss potential changes in resource planning and procurement processes to facilitate joint development and other forms of coordinated procurement among utilities.
3. Regarding evaluation of WREZ hubs and transmission in local, subregional and regional planning:
 - a. States and provinces should require utilities operating in their jurisdiction to evaluate WREZ resources and associated transmission in resource planning and procurement processes, including potential advantages and disadvantages of acquiring higher quality but more distant WREZ resources. States and provinces also should evaluate ways to improve the connection between long-term resource planning, transmission planning and resource procurement.
 - b. States and provinces should request subregional planning groups to evaluate transmission alternatives to WREZ hubs of common interest among member transmission developers and involve state and provincial decision-makers in these discussions. Some subregional planning groups already have taken steps in this direction. For example, Northern Tier Transmission Group (NTTG) studied four scenarios with high levels of renewable resources in quality wind areas in Wyoming and Montana for its 2010-2011 transmission plan. NTTG determined that additional transmission, beyond the foundational lines, would be needed to accommodate such resources.³
 - c. In future study cycles, WECC should build on the resource relocation cases for its 10-Year Regional Transmission Plan for 2020 to evaluate regional transmission alternatives to access geographically dispersed WREZ resources interconnection-wide. Longer-term transmission plans

³See NTTG's 2010-2011 Biennial Transmission Plan for the 2020 study year:

http://nttg.biz/site/index.php?option=com_docman&task=cat_view&gid=308&Itemid=31. NTTG studied four scenarios with high levels of generation in high-quality wind areas: 3,000 MW in Montana, Wyoming, or both and 6,000 MW in Wyoming. The study assumed the additional renewable resources served markets in the Southwest and California. In the NTTG plan, see Chapter 6 for scenario cases and Appendix 3 for the list of transmission projects tested.

- should consider the potential for higher renewable energy standards and more stringent air pollutant regulations.
4. Western governors and legislators should discuss options for harmonizing renewable energy credits that qualify for state renewable energy requirements, including reciprocity approaches for buying and selling power as well as renewable energy credits among neighboring jurisdictions, and potential cost reductions and economic development benefits for participating states.
 5. The Committee for Regional Electric Power Cooperation (CREPC) and the State-Provincial Steering Committee (SPSC) should explore the interaction of utility resource and procurement processes with subregional and regional transmission planning, particularly in light of FERC Order 1000 which requires each transmission provider to consider needs driven by public policy requirements in both local and “regional” planning. Such work should include evaluation of modeling tools to optimize selection of wind and solar sites to increase energy output, minimize output variability and foster increased power trading among states.
 6. WGA should foster coordinated siting and permitting of transmission lines among all affected federal and state agencies and tribes. Cooperation on siting and permitting would support coordinated resource procurement and transmission development. Further, WGA should use the approaches and data developed by the Western Governors’ Wildlife Council and WECC’s Environmental Data Task Force to facilitate early coordination during the transmission planning phase to reduce the risk of serious problems with environmental and cultural issues arising during the transmission siting and permitting phase.
 7. CREPC should consider whether to advocate for FERC transmission incentives for interstate lines that access renewable resources from regional renewable energy zones designated through a stakeholder-driven process in areas with low environmental conflicts.
 8. CREPC and subregional planning groups should evaluate options for mitigating pancaked transmission charges. CREPC could begin exploring this issue at its spring 2012 meeting, inviting utility transmission managers and other experts to participate in a panel on this subject.
 9. SPSC and CREPC should continue to explore ways to improve utilization of the existing transmission system in order to reduce the need for new lines to deliver energy from WREZ hubs to loads. The SPSC’s planned 2012 workshop on advanced transmission technology could explore this topic.
 10. CREPC should serve as a forum to vet ideas for increasing system flexibility – through demand-side measures, market mechanisms, operational changes, optimized siting of wind and solar resources, and new technologies – in order to mitigate growing concerns about integrating variable resources that may dampen renewable energy development overall.
 11. Regional transmission expansion planning studies should further examine scenarios where transmission freed-up due to changes in resource mix and power plant operation could help deliver energy from WREZ hubs to load centers in ways that minimize output variability, reducing the need for new transmission facilities and fossil-fuel generation. Subregional planning groups should consider similar scenarios, as well as factors that affect repurposing transmission lines for delivering variable energy resources.
 12. States and provinces should consider potential changes to cost recovery statutes in order to facilitate interstate transmission lines for renewable resources that provide long-term economic and reliability benefits for retail electric consumers and encourage efficient build-out of the regional grid.⁴

⁴For example, see Section 37-2-114 in Wyoming House Bill 111 (<http://legisweb.state.wy.us/statutes/statutes.aspx?file=titles/Title37/Title37.htm>), Kansas Statute 66-1247 (http://kansasstatutes.lesterama.org/Chapter_66/Article_12/66-1247.html) and Minnesota Statutes 216B.243, Subdivision 3 (<https://www.revisor.mn.gov/statutes/?id=216b.243>).



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