

Western Renewable Energy Zones (WREZ)
An Initiative of the Western Governors' Association
and the U.S. Department of Energy

Frequently Asked Questions

What is the purpose of the WREZ project?

The WREZ seeks to identify those areas in the West with vast renewable resources to expedite the development and delivery of renewable energy to where it is needed. Renewable energy resources are being analyzed within 11 states, two Canadian provinces, and areas in Mexico that are part of the Western Interconnection. A map of the jurisdictions in the Western Interconnection is available on the Web at: <http://www.nerc.com/page.php?cid=1|9|119> Stakeholders representing a variety of interests from throughout the region are participating in a collaborative process to produce reliable information to support the cost-effective and environmentally sensitive development of renewable energy in specified zones. The WREZ project will also produce conceptual transmission plans for delivering that energy to where it is needed within the Western Interconnection.

Who oversees the WREZ project?

The WREZ project is guided by a Steering Committee comprising governors of the 11 Western states within the Western Interconnection, public utility commissioners from each of those states and the Premiers of British Columbia and Alberta. The Chairman and Vice-Chairman of the Western Governors' Association, Governors Jon Huntsman of Utah and Brian Schweitzer of Montana, head the Steering Committee. Also included as non-voting members are federal officials from the departments of Energy, Interior and Agriculture, as well as the Federal Energy Regulatory Commission.

A Technical Committee, appointed by the Steering Committee, is comprised of representatives from the states and provinces, from each WREZ work group and from the range of stakeholders interested in energy issues in the West. The Western Governors' Association and the U.S. Department of Energy provide staff support to the WREZ project

How is the WREZ process structured?

The WREZ work plan is divided into four phases:

Phase One: Identify REZs

All commercial renewable resource potential in the Western Interconnection will be identified in Phase One. The best resources and those that are located in close proximity to each other will be aggregated into REZs. Assumptions and modeling methods will enable utilities, regulators and others to estimate the generation and related transmission costs to deliver these renewable resources from each REZ to the major population centers in the interconnection.

Phase Two: Develop a Conceptual Transmission Plan to Move Power from REZs

Through the existing Western Electricity Coordinating Council and sub-regional transmission planning groups, a conceptual transmission plan will be developed that demonstrate the means to deliver energy from the identified REZs to locations where the power is needed. This phase will include transmission modeling to study the additions to the transmission system that may be needed to move power from REZs.

Phase Three: Coordinate Procurement to Support Commercial Transmission Projects and a Regional Market for Renewable Resources

Phase Three will examine how to best stimulate the development of commercial generation within REZs and transmission projects to move power from REZs. State and provincial utility commissions, power companies and generators will be brought together to develop mechanisms for coordinating both the timing and the regulatory approval of procurement across state jurisdictional lines. Coordinating procurement among buyers of a utility's power provides a way to aggregate renewable supply needs and support development of a region-wide market for renewable power.

Phase Four: Build Interstate Cooperation to Facilitate Transmission Approvals, Allocated Costs and Ensure Cost Recovery

Phase Four will engage political, industry and stakeholder leaders to build the interstate cooperation necessary to facilitate the permitting of multi-state generation-transmission projects and address cost allocation issues.

What is the timeline for the WREZ project?

The Western Governors' Association and the U.S. Department of Energy launched the WREZ project in May 2008. Phase One will be completed in June 2009, with the Steering Committee to be considered by the Western Governors at their Annual

Meeting that same month. The Phase Two conceptual transmission planning report will be completed by Fall 2009. Phase Three discussions begin among utilities on coordinated procurement and Phase Four collaborative efforts among state and federal agencies in the review of permits for interstate transmission will also commence in the Fall of 2009.

How can the WREZ outcomes be used by a state, province or tribe?

A number of states, including Colorado, California, Utah, New Mexico and Nevada, have completed or will soon complete their own state analysis of locations where renewable energy may be generated. The WREZ project is using information developed by states to help construct a comprehensive regional map showing areas with the most promising potential based on a number of criteria and across state lines. The WREZ process will not override individual state efforts. Rather, it will provide information and tools that can be used by the public and private sectors to examine scenarios for developing renewable resources, the transmission needed to bring them to market and the associated costs.

How will tribal lands be impacted by the WREZ process?

The WREZ is looking across the Western region for the best renewable resources regardless of land ownership or jurisdictional boundaries. Tribal lands in the West have tremendous potential to produce renewable energy. Tribal representatives are participating on work groups and the Technical Committee. The objective of the WREZ applies to tribal lands as well as state and federal lands: illustrate those areas in the West with vast renewable resources to expedite the development and delivery of clean and renewable energy. The WREZ initiative does not circumvent any tribal permitting process for energy or transmission development. It is simply a tool for load serving entities to use when purchasing power and identifying transmission corridors.

How does the WREZ impact state renewable portfolio standards?

Nine of the 11 WREZ states have approved renewable portfolio standards or goals that require a certain percentage of power come from renewable resources within a specific time frame. In many states, the lack of transmission is a critical barrier to meeting those requirements. The WREZ aims to provide effective planning tools and detailed information that will assist states and provinces in identifying potential resources, transmission routes and generation sites within and across their borders.

What authority or impact will a final REZ designation have?

The goal of the WREZ initiative is to develop the foundation for a Western regional market and transmission grid for renewable energy resources. The WREZ project will stimulate and focus the development of, and build broad support for, commercially viable regional transmission projects. A proposed renewable energy zone will have no legal or regulatory status associated with it, nor is there any certainty that a transmission line will be built to a particular REZ. No aspect of the WREZ project impinges on the legal authority or replaces the regulatory role of any state, provincial, tribal or federal agency. The WREZ project will provide information to utilities, generators, transmission developers, regulators and the public to better inform decisions on the location and cost of renewable generation and associated transmission costs.

What happens to a renewable energy source that is not located in a WREZ?

Renewable resources that fall outside of a particular REZ will be identified on maps, and the size of the resource's potential will be estimated. A generic roadmap will be produced with information on how such resources could be developed and transmission accessed.

What is the role of each WREZ work group?

Zone Identification and Technical Analysis Work Group

The Zone Identification and Technical Analysis work group <http://wZone.lww.westgov.org/wga/initiatives/wrez/zita/index.htm> has been responsible for developing criteria to identify highly concentrated areas of energy potential for extra-high voltage transmission lines. The methodology for assessing renewable energy potential proceeded incrementally from very inclusive criteria to more restrictive criteria. The more restrictive criteria resulted in the identification of Qualified Resource Areas (QRAs), which represent the greatest, contiguous density of each state's or province's best renewable energy resources. The QRAs focus on the technical potential of an area, taking into account land use restrictions established by law.

Environment and Lands Work Group

The Environment and Lands work group is responsible for the development potential of Qualified Resource Areas based on environmental, land use and wildlife criteria

The work group is composed of representatives from all levels of government, nongovernmental organizations and industry. The E&L work group ["http://www.westgov.org/wga/initiatives/wrez/enviro/Roster.pdf"](http://www.westgov.org/wga/initiatives/wrez/enviro/Roster.pdf) has also been working

closely with state fish and wildlife agencies through the Western Governors' Wildlife Council. ["http://www.westgov.org/wga/initiatives/corridors/index.htm"](http://www.westgov.org/wga/initiatives/corridors/index.htm).

The Council is responsible for determining how to categorize lands within QRAs based on wildlife criteria.

Please note: Qualified Resource Area maps posted on this Web site as part of the February 2009 public comment period do not include an analysis of wildlife data. Analysis of that data is expected to be completed and made available for comment in early April. Background on the wildlife data request and wildlife information submitted to date for the WREZ process can be viewed on the main E&L work group Web page ["http://www.westgov.org/wga/initiatives/wrez/enviro/index.htm."](http://www.westgov.org/wga/initiatives/wrez/enviro/index.htm)

Generation and Transmission Modeling Work Group

The Generation and Transmission Modeling work group

<http://www.westgov.org/wga/initiatives/wrez/gtm/index.htm> has two primary tasks:

- 1) Guide the work of a technical contractor to develop a transparent and user-friendly model to enable load-serving entities, regulators and others to evaluate the delivered price of power coming from specific REZs; and
- 2) Engage in the Western Electricity Coordinating Council and sub-regional transmission planning processes to study transmission needed to move power from REZs to load.

During Phase One of the WREZ project, this group coordinates with the other work groups to scope the model and necessary data inputs. The majority of work will occur during Phase Two of the WREZ project. These efforts will include completing the model, training on how to use the model, and providing guidance to WREZ project staff to engage in the WECC transmission planning process -- including sub-regional venues -- to study transmission needed to move power from the agreed to REZs to load centers.

How can I participate in the efforts of the work groups?

The WREZ project has used a transparent and stakeholder-driven process to develop its products and it will continue to do so. It is very important that representative stakeholders, including representatives of all types of renewable technologies, participate and help validate the work at each stage of the WREZ initiative. All meetings of the WREZ Technical Committee and work groups are noticed on the Western Governors' Association Web site <http://www.westgov.org/wga/initiatives/wrez/index.htm> and are open to the public. Work groups also hold conference calls and "webinars" which are noticed and open to the public. Draft information on Phase One was made available to the public on February 2, 2009 for a 30-day public comment period. An additional public comment period on wildlife information will take place in April 2009.

The WREZ project operates under a specific set of ground rules that speak to representation and consensus. These ground rules are available on the WREZ Web site. Please contact the WGA if you have any questions about how to get involved.

Zone Identification and Technical Analysis Work Group

Why were different criteria used for selecting Qualified Resource Areas from Candidate Study Areas? For example, Class 5 wind resources were assessed in Montana and Wyoming and Class 4 and 3 resources were used in other states.

The purpose of the criteria, such as wind class, is to identify those areas that are economical to develop for large scale transmission. The underlying assumption is that the better wind class is more economical to develop and would be developed first. With the vast amount of wind resources in states, such as Montana and Wyoming, higher thresholds were established to identify the best resources.

Please explain why only 25 percent of the wind resource and 3.5 percent of the solar thermal resource were used in estimating the development potential of Candidate Study Areas?

It is reasonable to expect that not all of the renewable resources within a Candidate Study Area can be developed. It is also necessary to approximate the amount of capacity that would actually be built in an area in order to help size transmission lines more realistically. Various constraints, such as land ownership, presence of structures, local zoning restrictions or other factors will limit the “developability” of resources. For this reason, developability discounts were applied to the screened resources to account for the likelihood that within any CSA, only a portion of the total resource potential will be developed. Based on an examination of previously constructed projects, 25 percent of the wind resource potential was calculated, and 3.5 percent of the solar thermal resource potential was quantified. This mathematical adjustment did not change the area covered by a CSA, only the amount of capacity estimated for development within each grid square. Because they are quantified on a site-specific basis, no developability discounts were applied to discovered, conventional geothermal resources or large hydropower resources.

What are the methodology or other differences between how you established QRAs in the United States versus those established in Canada and Mexico?

The WREZ project assessed renewable energy generating potential across the Western Interconnection using a combination of raw resource data excluded for environmental and technical exclusions and also project-level data, when raw resource data were not available. There are differences between the types of resources assessed and the resource assessment methodologies in the United States and Canada.

In the United States, the WREZ project is modeling incremental additions of hydropower potential at existing dams or the addition of energy generating capabilities to dams without power. The WREZ project is not modeling “run of river” projects or large projects that require new diversions. In Canada, the WREZ will model both incremental additions of potential and new projects, large and small.

In the United States, wind resources were assessed using wind power density maps. Technical and environmental exclusions were applied and the remaining developable resource was quantified and discounted to reflect other potential “developability” constraints. Comprehensive wind power data were not available for British Columbia and Alberta. Alternative methods were used to characterize the wind energy resources in these provinces. These wind resource assessments relied on project-level data, rather than “raw” resource data. In British Columbia, the WREZ project is using BC Hydropower’s mesoscale modeling study of wind resources at locations where investigative use permits for the development of projects have been filed. In Alberta, the WREZ is using data from the Alberta electric system operator’s queue to determine general project locations

The same resource quantification methodology applied in the United States was then applied to land in Canada. The difference is that for Canadian resources, specific project locations are used, rather than the high-level resource map used in the United States. The grid squares in Canada are often non-contiguous and isolated when compared to those used for the United States. These non-contiguous grid squares in Canada were grouped into QRAs when they fell within 100 miles of each other.

Additionally, the WREZ project discounted by 75 percent the technical potential of each grid square in the United States to account for probable wind developability constraints. The MW of potential indicated by the British Columbia and Alberta data was not discounted at all. These assessments have already accounted for developability constraints, because they are project-level assessments rather than being based on potential wind power resource data.

The exact same methodology used to establish QRAs in the United States also was used for Mexico.

I live near a very large wind farm and would like to see one built on my property, but neither my land nor the wind farm appear to lie within a QRA. Is there a way to have it included in a QRA?

Areas within a QRA have been identified as having very good, large-scale renewable energy resources that would justify the construction of high-voltage, interstate transmission lines within the Western Interconnection. There are many areas that have good resources outside the QRA boundaries that may also be developed because they would help meet renewable energy needs within a state or could be picked by a transmission line from another area. The QRA designation is not meant to preclude renewable energy development, but is simply an area identified for meeting regional transmission needs.

How will you decide if a QRA becomes a REZ, and will I have an opportunity to comment on the REZs you decide upon?

In most cases, QRAs will become REZs. QRAs may be eliminated or their boundaries changed if specific environmental or wildlife sensitivity data are obtained that either preclude the entire QRA from development, shrink the renewable energy generating potential inside that QRA to below the minimum MW threshold, or alter the boundaries of that QRA. Information obtained during the public comment period and information on wildlife sensitivities obtained from the Environment and Lands work group will be assessed and used to make these alterations. There will be an additional public comment period in April to review how wildlife information has been incorporated to help shape the final REZs.

Forest residues, as well as urban and agricultural waste, provide extensive biomass resources that can be used to generate electricity. So do small hydropower projects. How were those resources quantified in your designation of QRAs?

Given the distributed nature of biomass and small hydropower, it is unlikely that either resource will be of sufficient scale to warrant creation of a Renewable Energy Zone in and of themselves. While important, these resources are too small on their own to impact regional transmission siting. However, there may be biomass and hydro potential within a Qualified Resource Area that can enhance and stabilize proposed renewable energy generation from wind, solar or geothermal. For each QRA, the small hydropower and biomass potential will be screened for land use, environmental and economic potential and their energy generating potential will be included in the calculation of renewable power generating capacity.

Environment and Lands Work Group

The Exclusion Area list does not include information from many Western states or from Baja California. Does this mean there are exclusion areas that are not yet illustrated on the QRA maps?

The specific state and provincial exclusions listed on the Exclusion Area list are areas where those states and provinces have a specific statute or regulation precluding renewable energy development. If lands from a particular state are not yet included on the exclusion list, then that state did not provide information for areas where there is a statute or regulation precluding renewable energy development.

State and provincial areas that are not governed by a statute or regulation, but where renewable energy is discouraged based on purpose, policy or restriction, have been listed on the Avoidance Area list. For example, California has a statute precluding development in state parks, so California State Parks are listed on the Exclusion Area list. Other states do not have similar statutes, but agreed collectively that utility-scale renewable energy development should be discouraged in state parks. Therefore, state parks for all 11 states have been listed on the Avoidance Area list.

Exclusion and avoidance areas have not yet been identified in Baja California, Mexico. Information from Baja is currently being sought.

Because wildlife data is not yet incorporated in the QRA maps, when will data be available for viewing and comment?

Wildlife categorizations will be completed by the Western Governors' Wildlife Council in early April. The WREZ work groups will review the categorizations and make any necessary adjustments to REZ boundaries. The REZ maps will be made available for a second public comment period in April.

How will the information you are developing help protect wildlife habitat as renewable resources are developed and transmission lines built?

The Western Governors' Wildlife Council categorizations are intended to inform decisions about renewable energy development in order to avoid or minimize conflicts with wildlife. The final REZ designations aim to steer around wildlife-sensitive areas to the greatest extent possible. Additionally, the wildlife categorizations are intended to

provide developers with information about known hurdles for development and flag areas where implementation of mitigation measures may be necessary.

Generation and Transmission Modeling Work Group

How will the specific routes for eventual transmission of WREZ resources be determined?

The WREZ project will not designate transmission routes. It will provide load-serving entities, regulators, energy policy makers and others with analytic tools to assist them in evaluating whether the potential renewable generation in specific zones is an attractive resource option. When estimating the length and possible location of transmission needed to move power from a zone, preference will be given to using existing energy corridors. Subregional transmission planning groups and the Western Electricity Coordinating Council will be asked to develop conceptual transmission plans from priority zones. Neither the WREZ nor sub-regional or WECC transmission planning processes will perform site-specific routing studies. This is ultimately the job of transmission project sponsors.

How will the WREZ project identify transmission needed to connect renewable energy zones to the grid?

In Phase Two, the WREZ project will engage in the Western Electricity Coordinating Council and sub-regional transmission planning processes to study transmission needed to move power from REZs to load centers. The WREZ project has submitted a study request for WECC's 2009 work plan to evaluate transmission opportunities. <http://www.westgov.org/wga/initiatives/wrez/WREZ%20Study%20Request%20to%20TEPPC.pdf> The WREZ study request will ask WECC to model and identify new transmission to deliver large amounts of power from the most promising renewable energy zones to load centers under multiple scenarios. WREZ work products will improve WECC's transmission planning process by providing valuable information on the location, size, and cost of large amounts of potential renewable energy generation across Western states, two Canadian provinces, and the northern part of Mexico. WECC should complete its transmission analysis of the WREZ scenarios in the first quarter of 2010.

Will the public have an opportunity to comment on any outcomes from the transmission study request to the Western Electricity Coordinating Council?

WECC requires that all transmission study requests be submitted by January 31 each year to be considered for inclusion in its annual work plan. The WREZ project submitted its study request to the WECC by that deadline.

<http://www.westgov.org/wga/initiatives/wrez/WREZ%20Study%20Request%20to%20TEPPC.pdf> The study request submitted was developed by the stakeholders participating on the Generation and Transmission Modeling work group and was reviewed by the stakeholders on the WREZ Technical Committee and by the WREZ Steering Committee. However, because of the January 31 deadline, the WECC study request will not be part of the package of materials released for public comment from February 2 to March 2, 2009.

How will the transmission modeling exercise of Phase Two be able to move forward when wildlife information for sensitive lands has not yet been incorporated into the Qualified Resource Area maps of Phase One?

The WREZ project has engaged WECC in transmission planning for REZs through a study request submitted in late January 2009. The study request outlines proposed scenarios to model and evaluate the transmission system assuming future development of generation from renewable energy zones. WECC will be reviewing and integrating the WREZ study request with other study requests from February through April, 2009. WECC will not begin detailed modeling work until after April 2009. The WREZ project anticipates that it will have new wildlife and environmental information in April 2009 that can be used to identify sensitive areas in Qualified Resource Areas, and thereby guide the WREZ process in identifying final Renewable Energy Zones. It is anticipated that the wildlife information for REZs should be available by the time WECC transmission modeling is underway in the second quarter of 2009.

Will the WREZ initiative bypass local processes related to the siting and construction of transmission towers and lines that consider issues related to health, visual impacts, right-of-way determinations and compensation?

The WREZ project will not have any authority to alter or bypass local processes related to siting and construction of new transmission facilities. The WREZ project will be developing high-level conceptual transmission plans. It will not impact the actual siting and review process of proposed projects conducted by local, state or tribal governments, the federal government or provincial authorities.

Will the WREZ initiative likely change the configuration of the existing transmission system?

The WREZ project will provide better information to industry and governmental entities enabling them to make more informed decisions about the best available renewable resources in the West and the conceptual transmission plans to deliver this power to load centers. This may or may not lead to an expansion of the existing transmission system. The magnitude of transmission expansion will depend upon the need by load serving entities to use renewable energy from REZs located a significant distance from load areas.

How does the WREZ process factor in distributed generation from individual homes, farms and businesses or small-scale projects that are not regional in nature?

The WREZ initiative is developing a model that will enable users to compare the cost of power delivered from REZs to the cost of alternative resources. The model will be flexible enough for users to incorporate information on the availability and cost of local resources, such as distributed generation resources from homes, farms and local businesses.

How is the transmission information in the February 2nd public comment package used in the WREZ process?

The February 2nd public comment package includes information from the Generation and Transmission Modeling work group on transmission segments and transmission characteristics, such as the cost of different sizes of wires. This information is ONLY used to enable the WREZ transmission model to calculate the rough cost of transmission from a Qualified Resource Area to a load zone. The transmission segments information is used to estimate the distance from a QRA to a load zone. The information on transmission characteristics is used to estimate the cost per mile of different-sized wires. This is one component of the information used in the WREZ model to estimate the delivered price of power from specific QRAs to specific load areas. The segments do NOT indicate the likely route of a transmission line. The route of a proposed transmission line will be determined by the transmission developers and existing regulatory processes for securing rights-of-way and permits.

How were the transmission segments determined?

When determining segments to be used in the model, it was decided to use existing transmission corridors to estimate mileages between a QRA and a load zone. This method was determined preferable to using straight lines from QRAs to load zones. The straight line approach would have underestimated the miles of transmission needed

to avoid areas where transmission cannot ultimately be sited, such as national parks and wilderness areas.

Why do the transmission segments not show all the existing transmission lines in the Western Interconnection?

Because only the distances of the segments are being used in the model, it was not necessary to show every transmission line. This would vastly complicate the model calculations without adding any value. The segments shown on the map represent all the major transmission paths (groupings of lines going in the same direction) in the Western Interconnection.

How will the WREZ model use the information on segments and transmission characteristics?

The WREZ model will estimate the delivered cost of power from renewable energy zones. The delivered cost of power includes the cost of transmission. The information on segments provides the road map to derive the distance from a given REZ to a load area. The transmission characteristics information will be used to derive the cost of moving power over a type of transmission line per mile. The transmission cost per mile and the distance from a REZ to load center will be combined to derive the transmission cost of power.