

Transmission Update

August 2008

Summary

- ✓ Welcome to the Eighteenth National Wind Coordinating Collaborative (NWCC) Transmission Update! Kevin Porter of Exeter Associates, Inc. led the August 19, 2008, Transmission Update conference call. As always, this written brief is being distributed after the call to conference call participants, other NWCC members and participants, and to interested NWCC observers.
- ✓ This update features the California Renewable Energy Transmission Initiative (RETI) for identifying renewable energy zones in the state and building transmission lines to access them, and the Western Renewable Energy Zones (WREZ) project aimed at identifying and quantifying areas in the Western Interconnection that contain high levels of renewable energy resources.
- ✓ Specific topics covered in this brief include:
 - How California's RETI process may enable the building of transmission to meet California's renewable portfolio standard (RPS)
 - How the WREZ project is moving ahead with mapping renewable resources, conducting conceptual transmission expansion planning, and building a user-friendly model for the evaluation of renewable energy zones
- ✓ Dave Olsen from the Western Grid Group described the RETI process. Doug Larson from the Western Interstate Energy Board and Rich Halvey from the Western Governors' Association (WGA) discussed developments concerning the WREZ project.

California Renewable Energy Transmission Initiative

Background

In September 2007, the California Renewable Energy Transmission Initiative (RETI) was launched to identify transmission projects needed to accommodate renewable energy development to meet the California RPS, which requires 20 percent of electricity to be generated from renewable resources by 2010, and to assist in meeting the state's policy goal of having 33 percent of electricity generated from renewables by 2020. Mr. Olsen noted that the 33 percent policy goal will require an additional 20,000 MW of renewable generation above and beyond what is needed for the current California RPS. He said the RETI project

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will identify competitive renewable energy zones (CREZs) that have a sufficient density of renewable resource potential to justify building the transmission to access them. Transmission projects are expensive and only a limited number of new lines can be built. Mr. Olsen said the RETI process will allow the state to identify the transmission projects that will be most cost-effective with the least amount of environmental impact.

RETI Process

Mr. Olsen said RETI was a joint effort of the California Public Utilities Commission (CPUC), the California Energy Commission (CEC), the California Independent System Operator (CAISO), and the publicly-owned utilities in the state. RETI includes a large coalition of stakeholders with the goal of building a broad base of support for approval of transmission projects. Mr. Olsen explained that RETI consists of four levels of activity:

1. Coordinating Committee – this committee provides the overall policy direction and keeps the process on schedule and aligned with state goals. Its members consist of representatives from CPUC, CEC, CAISO, and the public utilities.
2. Stakeholder Steering Committee – this large committee consists of 29 stakeholders and is charged with doing the actual program implementation work. The committee has members from every transmission provider in the state, as well as representatives from wind, solar, geothermal and biomass companies; environmental organizations; agricultural organizations; consumer groups; tribes; and the military. Mr. Olsen noted that the military was involved because the military owns a lot of land in California with renewable energy generation potential.

The Stakeholder Steering Committee drives the RETI process. It meets monthly and communicates with all the relevant organizations in the various constituencies. This committee will be making the final decisions on identifying the renewable energy zones and will attempt to craft a consensus plan for three to six major transmission projects. The Steering Committee oversees and organizes Working Groups that tackle various specific issues.

3. Working Groups – the Steering Committee forms work groups for specific tasks on an as-needed basis. The Environmental Working Group (EWG) is now developing a methodology for rating environmental impacts of CREZs, and for integrating environmental rankings with economic rankings for the CREZs. Another work group is developing a work plan to guide Phase 2 of RETI, the conceptual transmission planning stage. The EWG is composed of representatives from numerous environmental groups contributing a broad variety of information and perspectives on the environmental model being developed for RETI.
4. Plenary Stakeholder Group – this group is open to the public and consists of a large public outreach effort with periodic open meetings, both in person and on the

internet. The goal is to inform as many people and to gather as much information as possible.

Mr. Olsen said RETI consisted of three separate phases and that they were nearing the end of Phase 1.

Phase 1: The first phase consists of identifying and prioritizing the CREZs. These zones will include multiple renewable energy technologies and will encompass differing mixes of wind, solar, and geothermal, with biomass also represented in a few zones. Mr. Olsen said they hope to have the CREZs identified and prioritized according to the cost of developing the power sources, including the costs of the transmission lines, in each zone by October 1, 2008. The costs will be expressed as \$/MWh. The environmental ranking system being developed will create environmental supply curves (described in greater detail below) for each CREZ. The final decision on zone selection will be based on both the development costs and the environmental costs.

Phase 2: This will consist of developing conceptual transmission expansion plans needed to access the selected CREZs. The Steering Committee is aiming to have a draft report prepared by the end of 2008 and the work finished by the second quarter of 2009 so it can be incorporated into the CAISO's transmission plan.

Phase 3: This phase will involve working with CAISO's transmission planning process to transform the conceptual transmission plans into detailed transmission proposals. The transmission projects will be sponsored by transmission owners (including municipals, electric utilities and rural electric cooperatives) who will file the applications for the Certificates of Public Convenience and Necessity (CPCN) at the CPUC.

Mr. Olsen said the earliest that any new transmission lines could be in service is 2012 or 2013, while 2014 may be more realistic. All parties are feeling a sense of urgency in getting these transmission projects off the ground in order to meet the State's RPS and climate change requirements.

**Key Issues &
Characteristics
Unique to
California**

Mr. Olsen said there were several energy zone type initiatives ongoing at present, including WREZ. He noted that almost everyone thought the idea made sense, but transmission cannot be built everywhere. Therefore, transmission projects need to be rationalized and restricted to corridors, and a limit put on the number of renewable energy zones. Put another way, the next strategic transmission projects need to be selected and focused on. The California process will focus on transmission projects in selected areas, thereby restricting renewable development to certain geographic locales. Mr. Olsen noted that this is a new model for generation developers and while they see the need for this approach, many are also uncomfortable with it. Developers are accustomed to choosing their own locations based on resource quality, then working to get transmission built to them, and

developers are unsettled about the prospect of being geographically restricted.

RETI is also receiving strong support from the environmental community because it limits development to specific zones. However, Mr. Olsen noted, many are also uncomfortable with the zone concept as it presents some unique problems. For example, renewable energy zones will enable large-scale development in certain areas leading to larger localized environmental impacts. This is especially troublesome for groups focused on preserving specific areas such as the Mojave Desert, which is rich in solar resources.

Mr. Olsen said California is taking a unique approach to a valuation method for the renewable energy zones. The economic ranking will take into account all costs associated with developing the renewable resources in the CREZ and getting the power to market, expressed in \$/MWh. This will involve taking into account the capital costs of building the generation, the cost of the transmission lines, and the capacity and energy value on a time-of-use basis (i.e., the hourly value to the grid) of the projects. The environmental valuation is based on the estimated impacts in seven different categories with the respective impact ranked from 1 to 5, where 1 is the least amount of relative impact and 5 the greatest. A set of environmental supply curves will be created in conjunction with the economic values. Zones that pass both screens will be the ones that move ahead to Phase 2.

Mr. Olsen noted that this is a new and still untested approach. The RETI participants are not sure how the environmental ranking system will turn out and whether or not it will prove to be useful. He said the initial list of CREZs will be released on September 5, 2008. After the initial list is released in September, a process will begin where the CREZ boundaries are adjusted to reduce environmental impacts or to increase the value of power. The final rankings will be issued on October 1, 2008.

Discussion

A caller asked who was actually doing the work of locating and developing cost profiles for the zones. Mr. Olsen said the economic valuation work was being conducted by Black & Veatch, who would report to the Steering Committee, but the environmental rankings were being prepared entirely by the EWG.

A caller wanted to know if there was an effort to identify the multiple benefits of building new transmission in terms of serving overall load growth, as well as meeting the RPS. Mr. Olsen said the intent is to make any transmission projects coming out of the RETI process network upgrades, instead of long radial lines. If that can be accomplished, then the transmission project will qualify for cost recovery across all CAISO loads through FERC tariffs, rather than being assigned directly to generators, as would be the case with radial lines. Mr. Olsen said that was the lesson of the Tehachapi Study Group, which he led. Now under construction, the Tehachapi project will connect 5,000 MW of wind at a cost of \$1.8 billion. Of that, half of the amount went towards the construction of the high-

voltage lines; the rest was spent on distribution level upgrades needed to meet load growth in Southern California. He noted that most of the renewable potential in the state is located in Southern California, where population growth has already made transmission upgrades necessary. He said it is not a really large area and therefore integrating the CREZ development process with load growth upgrade needs should be possible. Mr. Olsen said the only real issue that may become a major problem is the allocation of costs and how to split the responsibility between transmission to facilitate renewable energy development and transmission to handle load growth.

Western Renewable Energy Zones

Background The WGA and the U. S. Department of Energy (DOE) launched the WREZ program in Salt Lake City on May 28, 2008, to expedite the development and the delivery of renewable energy from areas of high potential to western load centers. The effort supports WGA's 2006 resolution to develop 30,000 MW of clean and diversified energy by 2015. Eleven U.S. states, two Canadian provinces, and areas of Mexico¹ that are part of the Western Interconnection are participating in the WREZ initiative. The National Renewable Energy Laboratory (NREL) and Lawrence Berkeley National Laboratory (LBNL) are providing technical support.

WREZ Process Rich Halvey from the WGA explained the WREZ process as consisting of the following four phases:

Phase 1: The first phase will consist of identifying the renewable zones based on an assessment of renewable energy resource potential and technology characterizations. Mr. Halvey noted that this was a resource availability determination only and that any existing or proposed renewable energy projects were not being considered. Also as part of Phase 1, supply curves will be produced for each zone.

Phase 2: Once the zones have been identified, the second phase will involve developing conceptual transmission expansion plans. The first element of this phase is the development of a transparent, user-friendly model to enable load-serving entities, regulators and others to evaluate the delivered price of power from specific renewable energy zones to specific load areas.

Phase 3 and 4: The last two phases are envisioned as being the implementation phases to foster the coordinated procurement of renewable generation and to address challenges in the construction of interstate transmission to the zones (e.g.,

¹ Alberta, British Columbia, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, and an area in Mexico in the state of Baja California. Small parts of Texas, Nebraska, and South Dakota also lie within the Western Interconnection; WGA plans to approach each of these states to determine their interest in participation in WREZ.

permitting, cost recovery).

Mr. Halvey said the WREZ project had just started on Phase 1 by setting up the committees and some initial working groups:

Steering Committee: This is comprised of the Governors of the 11 states, one public utility commissioner from each of the 11 states, the premiers of the two Canadian provinces, a representative from the relevant area in Mexico, and ex-officio members from the U.S. Departments of Energy, Interior, and Agriculture. The Steering Committee is responsible for approving proposed renewable energy zones and any supporting analysis.

Technical Committee: This is comprised of stakeholders and currently has about 40 members. This committee will conduct the bulk of the actual work involved with the WREZ initiative. It will assign specific duties to the various working groups and will direct and monitor their progress. The following working groups have already been formed:

REZ Criteria and Technical Analysis Working Group – This group will identify potential areas for designation as zones, based on resource potential and excluding areas where development would not occur, such as state and national parks and wilderness areas, urban areas and unacceptable terrain.

Environment and Lands Working Group (ELWG) – This group is identifying all the areas that should be excluded from consideration due to environmental concerns. Among other things, this group is considering additional areas for possible exclusion, such as wildlife corridors not protected by legislation or regulation.

Generation and Transmission Modeling Working Group – This group will oversee the development of a model to evaluate the delivered price of power from specific zones and engage sub-regional and interconnection-wide transmission planning processes in the development of conceptual transmission plans to zones.

Mr. Halvey said that after the areas are identified and modified based on the ELWG recommendations, the next step will be to assemble supply curves for the study areas. He said the planned schedule of work is as follows:

- End of September 2008 – identify the areas based on resources and make initial cuts for exclusions
- End of 2008 – complete the supply curve analysis and identify proposed zones based on ELWG's recommendations
- January 2009 – send supply curve analysis and zone selections to the Technical Committee for review
- February 2009 – release the final zone selection for public comment

Mr. Halvey noted that the DOE also wanted an evaluation of resources outside the zones, and that this would be done initially, but only the chosen zones would be included in the supply curve analysis.

WREZ Phase II

Mr. Larson said that a core assumption for Phase 2 is that no transmission will be built unless a load-serving entity (LSE) wants to buy the power and will sign up for transmission service. Mr. Larson explained that in the West generally, there is no mechanism to force unwilling parties to pay for transmission. The overall purpose of the WREZ project is to bring parties together to identify priority development areas, coordinate renewable energy procurement regionally, and engage regional stakeholders and policy-makers in building support for large-scale regional transmission to priority renewable energy zones. This will include briefing WECC and the sub-regional transmission planning groups on the status of WREZ, and encouraging those groups to conduct studies of transmission to priority renewable energy zones. The WREZ project will be making a study request to WECC in January 2009.

Also as part of Phase 2, a user-friendly model will be developed that will estimate the delivered energy cost from in-state and out-of-state renewable energy zones to utility load centers. Model users will be able to adjust the major inputs such as the hourly value of electricity, natural gas prices, projected carbon prices, and changes in generation technology costs. The model will also identify when different LSEs may be interested in renewable energy resources in the same renewable energy zones. Black & Veatch and LBNL are developing the model.

Discussion

A caller asked a question about planned renewable energy and transmission projects fitting into WREZ. For example, if there is a proposed renewable energy project somewhere with a utility already lined up to purchase power from it and a transmission line is being considered, how could that line be added into the WREZ process so that it could be built on a larger scale and able to accommodate more renewable energy projects. Mr. Larson said the WREZ project will map all of the resource potential in a zone and enable LSEs to estimate the price at which it can be developed. He noted that the market tends to build transmission lines at a size needed to meet near-term needs, which may not be optimal when considering new transmission to areas with large amounts of location-constrained generation (e.g., wind, solar, geothermal). The WREZ project will provide information that can be used to evaluate the longer-term cost of under-building lines to renewable-rich areas. However, Mr. Larson said there is no guarantee that WREZ will prevent transmission lines from being under-sized relative to the amount of available renewable energy resources.

A caller asked Dave Olsen to talk some more about the environmental ranking being developed in California and wanted to know if it could be used as a regional tool. Mr. Olsen said the process will have seven rating criteria, with each criterion scored on a 1 to 5 basis. That is, 20 percent of the projects with the least amount of

environmental impact will receive a rank of one and 20 percent of projects with the most environmental impacts will receive a rank of five. He said this creates a relative but rough quantification of impacts. He noted that for many environmental impacts, there was insufficient data available to make a definitive determination. For example, data on visual impacts was unavailable as well as data on impacts on Native American cultural sites. Mr. Olsen said that an attempt to create these types of ranks on a larger-scale (i.e., WECC-wide) would run into even more difficulties with respect to finding good data. A couple of categories had to be dropped because of data limitations. He said that conceptually, everyone agreed this was a good thing to try, but that the EWG was still working on implementing it and no one was sure how well it can be done in this version of RETI.

A caller wanted to know if the speakers thought renewable energy zones would lead to developers holding back on land acquisitions, which would in turn lead to a spike in land prices in various zones. Mr. Olsen said this was unlikely to happen in California, as the generators have already leased most of the land with potential renewable energy resources on them. He noted that the RETI participants had discussed how to discourage speculation in land leasing. Mr. Halvey said that the land areas under WREZ consideration were very large and it would be difficult for speculators to acquire sufficient quantities. He noted that they had experienced difficulties on the flip side, where developers that already have land leased in certain areas were pressing to have that land included as a renewable energy zone.

A final question was asked concerning discussions in Washington, D.C. and in Congress concerning a high-voltage transmission initiative for renewable energy and whether RETI and WREZ were taking this into account. Mr. Larson said he hoped the WREZ project would act to inform any national initiative, but that the feeling in the West was that they needed to move ahead and not wait for the federal government. Mr. Olsen said that RETI also was not going to wait for the federal government, but they would be tracking national transmission initiatives in Washington.

Implications

Renewable energy zones are a promising strategy for identifying areas of significant amounts of renewable energy resources and the transmission needed to access it. Collectively, the RETI and WREZ initiatives have the potential to identify and access thousands of megawatts of renewable energy, if not tens of thousands. Both RETI and WREZ are also attempting to take into account potential environmental impacts, although, as noted on the call, the data limitations are quite severe. For WREZ, a challenge will be in identifying the sellers and buyers of renewable energy on a large enough scale to support investments in multi-state transmission lines, as well as resolving transmission cost allocation issues across multiple states.

**For more
Information**

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