

Western Governors' Association

Western Renewable Energy Zones  
Zone Identification and Technical Analysis (ZITA) Working Group  
August 15, 2008  
10:00 – 12:00 MDT

**CALL SUMMARY**  
**HYDRO**

**Decisions & Next Steps**

- The group did not move forward with the definition of small hydropower that was provided. Instead, the group will resume discussions about the definition on the next call after the resource has been further defined with new information.
- NREL and Black & Veatch will begin compiling information to develop recommendations on significant resource areas, how to define the potential areas and how to be creative in hydropower generation.

**Action Items**

1. Howard Schwartz to assemble WA state-related information on hydro project owners and short- and long-term opportunities for incremental power generation on existing dams, and send the information to Linda.
2. Ed Higgenbottom to provide to NREL overview information on British Columbia's hydro resources, in consideration of regional transmission development and backbone system requirements.
3. BC Transmisison Corporation to provide their data on developing incremental resource areas to NREL.
4. Information on the three large Alberta hydro projects to be handed to the E&L WG for their analysis.
5. INL (Doug Hall) to provide data maps to NREL.
6. If the group has suggestions on whom to involve, especially in regards to environmental representation in British Columbia, please contact Linda.
7. Linda to post on CentralDesktop links to the documents referenced in the hydro criteria and definitions memo.

**Call Objective**

- The purpose of this week's call is to discuss small hydro resources, and how the resource should be handled as part of the REZ process. Hydro power could supplement resources within a REZ.

**Definition of Small Hydro Review, and Small Hydro Discussion**

- Julie Keil (PGE) and Jeff Leahey (NHA) presented a definition for small hydro, references to relevant legislation and an analysis of its feasibility with relation to inputs into WREZ. For the purpose of WREZ, hydro was defined as incremental hydropower, new hydropower at existing non-powered dams, or irrigation power.
- Jeff indicated that the definitions memo defines the difference between incremental hydro, hydro development and existing non-hydro dams. All applications are different, and would require separate environmental analyses.

- The purpose of the WREZ project is to define areas where large-scale transmission can be developed, but hydro does not always fall into that category. Therefore, small hydro can strengthen certain zones and provide value to variable resources. Incremental hydro could rise to the level of a REZ, but the main opportunities will stem from zones that have an additional hydro resource layer.
- As with other resource discussions, the group will determine criteria by which to measure and identify hydro resources, then define the candidate study areas and determine how small hydro can fit into larger zones, and finally develop REZs in coordination with the Environment & Lands Working Group (E&L WG).
- The quantity of new hydro projects is questionable. However, there are opportunities for incremental power generation at existing facilities, and new irrigation technologies. The REZ process would seek to retrofit existing diversions and impoundments without impacting small hydro opportunities. The group should focus on procuring incremental power from existing sites, or increasing the market reach of existing production. Typically, renewable energy resources can be built faster than tradition generation.
- The definitions developed focus on maximizing existing infrastructure and uses language that NHA and many environmental groups agree upon.
- Howard Schwartz offered to gather information on hydro project owners and short- and long-term potential for incremental hydro.
- Incremental power considerations:
  - When implementing incremental hydro, do the changes have environmental impacts, or can they be mitigated? Those items should be considered before excluding certain options.
  - Most dams have collaborative water plans that are developed with broad stakeholder groups. When changing water flows to allow for incremental power, those plans would have to be reopened.
  - An education process is necessary to inform on the possibilities related to incremental hydro. Then, the opportunities can be mobilized.
  - Hydro project managers have developed creative ways to increase energy potential on existing infrastructure and incremental hydro on both federal and non-federal lands.
- **The group needs to agree on the definition for maximizing existing small hydropower, then discuss how to handle the resource. Information on large projects will be distributed to the group.**
- **The group did not move forward with the definition of small hydropower that was provided. Instead, the group will resume discussions on the definition on the next call after the resource has been further defined with new information.**
- Criteria: The small hydro analysis should take into account all available information and should not discount small hydro based on claims of whether it is renewable or not (in the first stage). Hydro projects could be excluded from analysis because they are too dispersed, lack of information, or lack of transmission support. Potential categories to distinguish hydro resource opportunities could be probable, likely and speculative.
- Consistency of hydro information and data across states is critical in order to easily communicate the resource load in each region and develop continuous criteria. With large hydro resources, the criteria by which zones are determined must also be identical across technologies.
- Transmission becomes an issue in remote locations. Therefore, it is unlikely that hydro could be readily included in the REZs as a sole resource, since it is frequently developed in remote locations. In WA, most incremental hydro is clustered on the Columbia River. Although WREZ considers large projects, the cumulative MW from hydro improvements on the Columbia could combine to potentially be considered a zone. Reaching a power threshold could be difficult for

many other hydro resources. However, it could be reached in cumulative regions. Since WREZ does not have a predefined size for zones, hydro potential could add value to other zones with resource potential.

- The group discussed how procuring renewable energy might require traditional power. For example, pumped storage is not a renewable energy resource, but it does provide clean energy. The second phase of the WREZ analysis will capture those benefits, and indicate how far to go with the resources that are not considered 100% renewable.
- In determining a REZ, the environmental constraints within a particular project (e.g. fish screens) must be considered. Resource potential discussions should include environmental constraints.
- The WREZ process is currently mapping the U.S., Mexico and Canada to let regional leaders know where the resources are in order to start planning transmission.
- Jeff discussed the EPRI report that provides information on new hydro development.
- Once candidate zones are identified, they can be modeled as part of the cost curves.
- NREL and Black & Veatch will compile information and data, and develop recommendations on significant resource areas, how to define the potential areas and how to be creative in hydropower generation.

### **Canadian Exceptions Discussion**

- The group discussed hydro resources in Canadian regions.
- British Columbia:
  - BC's resource potential is not captured in the definitions.
  - There are hundreds of potential small hydro sites identified in BC. BC is conducting a study under their transmission policy to identify clusters and zones for renewable energy, a process similar to WREZ.
  - The majority of hydro resources are small in BC. There is little room for more large hydro projects. The permitting and regulatory framework, and footprint considerations to determine impacts around new hydro are much different than in the past.
  - Ed can provide overview information for British Columbia that considers regional transmission development and also considers the backbone system requirements, since transmission has the largest lead-time.
- Alberta:
  - Claude Mindorff indicated that the three existing projects in Alberta would not fit within the definitions provided. However, the projects comply with the Canadian Environmental Assessment Act and are considered low-impact.
  - Analysis of the three large Alberta hydro projects will be handled by the E&L WG.
- Most of the incremental gains in BC and Alberta have occurred in the last five years. Therefore, projects of interest in those regions are new hydro projects or efficiency upgrades. With generator rewinds, an additional 50-100 MW can be procured with efficiency upgrades. Incremental hydro can also be installed where there's spilling.
- The E&L WG could handle the hydro projects and related environmental concerns for Canada. WGA is hoping to have Canadian/BC environmental groups represented in the WREZ process. The Technical Committee representative from BC is aware of how the process relates to BC resources. If the group has suggestions on parties to involve, especially in regards to environmental representation in BC, please contact Linda.
- Alberta and BC could be treated as exceptions to the criteria defined for hydro.
- It was suggested that BC hydro be invited to participate.
- BC Transmission Corporation will provide their data on developing incremental resource areas to NREL

- It was suggested that the Canadian Hydropower Association be involved. However, from a Western U.S. perspective, CHA focuses on Eastern Canadian resources and might not have comprehensive information.

#### **Additional Discussion Items**

- The group will first determine preliminary information gaps, then determine next steps for the hydro resource. Linda asked that anyone with relevant information send it to her, and she will forward it to NREL and Black & Veatch, or the E&L WG for their consideration of the impacts.
- WREZ is trying to identify what resources can be developed in the next 10-15 years. If some projects are beyond that timeframe, they will not show up on planning maps. In addition, not all potential projects have longitude and latitude information, but all are in a geographic database.
- Doug Hall (Idaho National Laboratory) has mapping information showing projects that have been identified.

#### **Administrative Items**

- Linda will post on CentralDesktop links to the documents referenced in the hydro criteria and definitions memo.

#### **Call Participants**

Jason Berry	Utah State Energy Program
James Campbell	PacifiCorp
Linda Davis	Western Governors' Association
John Finn	Black & Veatch
Jim Gemmell	Independent Power Producers of British Columbia
Kevin Gilton	Black & Veatch
Ed Higginbottom	BC Transmission Corporation
Julie Keil	Portland General Electric
Jeff Leahey	National Hydropower Association
Claude Mindorff	WindEau, Inc.
Amanda Ormond	Ormond Group LLC
Martin Piszczalski	Sextant Research
Ryan Pletka	Black & Veatch
Howard Schwartz	WA State CTED Energy Policy
Madeleine West	Western Governors' Association
Morgan Poncelet	Kearns & West (recorder)