

Western Governors' Association

Western Renewable Energy Zones
Joint Environment & Lands Work Group and Zone Identification and Technology
Analysis Work Group Workshop
September 22 – 23, 2008
Denver, CO

Meeting Summary

Day 1 – Monday, September 22, 2008

12:00 – 1:00 p.m.

Lunch and Meeting Overview

Participants: ZITA WG and E&L WG (see participant list at end of document)

Rich Halvey, WGA, presented an overview of the WGA process and objectives. Rich's PowerPoint presentation (Overview of WREZ Objectives - Rich Halvey, WGA) is available at: <http://westgov.org/wga/initiatives/wrez/enviro/meetings/index.htm>.

Rich emphasized the following considerations:

- The joint workshop was convened between the Zones Identification and Technical Analysis Work Group (ZITA WG) and the Environment & Lands Work Group (E&L WG) to provide the WGs an opportunity to meet jointly to discuss pending documents and issues, and to begin overlapping efforts between groups.
- When REZ was started, it was envisioned that WGs would complete their deliverables separately. This meeting is an opportunity to focus on progress made and areas needing overlap.
- The WREZ process is a regional-scale process and is not a replacement for state processes. The WREZ process includes a consideration of resources outside of the renewable energy zones (REZs) in order to provide a comprehensive picture.

Dave Hurlbut, NREL, presented on how resources outside of the zones are handled. Dave's PowerPoint (WGA Resources Outside A Renewable Energy Zones - Dave Hurlbut, NREL) is available at: <http://westgov.org/wga/initiatives/wrez/enviro/meetings/index.htm>.

Dave emphasized the following considerations:

- There is a difference between REZ-resources and non REZ-resources. The WREZ process is not a forum for everyone, and might not fit everyone's needs.
- There exist high-potential resources that do not need REZs in order to be developed.

1:15 – 5:00 p.m.

ZITA Work Group Meeting

Participants: ZITA WG (see participant list at end of document)

Abby Arnold, facilitator, discussed the meeting guidelines, objectives and agenda. The meeting's objective is to review resource criteria developed by technical experts and the WG, develop an agreement for each resource, and develop draft candidate study areas (CSAs). The criteria will be used to evaluate resource potential in potential zones by identifying and defining CSAs for recommendation to the Technical Committee.

Ryan Pletka, Black & Veatch (BV), presented an overview of the CSAs and REZs determination

process. The CSAs identified today will be handed to the E&L WG for addition of environmental exclusions within those areas. Through that process, many non-REZ resources will drop off, and CSAs will shrink. The ZITA WG should focus on large resources that can be accessed with 500 kV transmission lines, to develop GW of power, not MW power. Resource-to-geography equivalencies are $1 \text{ mile}^2 = 100 \text{ MW solar}$, $10\text{-}20 \text{ MW wind}$, $600 \text{ MW geothermal}$.

Discussion items:

- Mexico is not currently participating in the process, although WGA has done outreach.
Amanda Ormond asked for targeted contacts from Roger Fragua (COTA), in order to continue reaching out to tribes in Mexico.
- A REZ can be changed with different resource layers. A CSA is not resource-specific.
- Transmission-driven process: Smaller zones that are harder to link may be dropped.
Modeling will assume approximately 20 conceptual load zones. Diurnal profiles for all REZs will be evaluated and the complementary nature of large transmission will be evaluated.
- Native American tribal lands are not categorically excluded. They will be considered later.
- WREZ Phase 1 will decide which areas on which to focus and make standard assumptions for comparing CSAs.
- WREZ Phase 2 will handle source to sink, resource capacity, and load profile analyses.
- Overlay maps do not yet take into account integration issues.
- WGA has not set a MW target for the WREZ process, and focuses on all MW potential.

Ryan Pletka BV, presented on resource criteria and definitions developed by the ZITA WG.

Solar Resource

Ryan Pletka presented criteria and definitions for solar, including a hypothetical map with solar criteria, a solar exclusions map (national parks, refuges, wild and scenic rivers, etc.), and both maps superimposed to show the raw resources with exclusions.

Discussion items:

- $6\text{KW}/\text{m}^2/\text{day}$ criterion: $5\text{KW}/\text{m}^2/\text{day}$ was suggested. There is concern that troughs (single access tracking) cannot meet the criterion. Proxy technologies (dual access systems) are being considered at this point. Also, although solar resource potential may be robust, many projects that do not meet $6\text{KW}/\text{m}^2/\text{day}$ could be overlooked. There is significant additional cost when using a lower-quality resource, and Ryan indicated that in his experience projects tend to use higher resources than $6\text{KW}/\text{m}^2/\text{day}$. **Peter Brehm (Infinia Corp.) will work offline with the ZITA WG to bring forward data demonstrating different insulations, to further evaluate $5\text{KW}/\text{m}^2/\text{day}$ potential.**
- There is not currently a buffer around airports for solar. Airports do not preclude solar. This criterion will be determined later by the ZITA WG.
- Solar criteria do not yet include cost filters. Lower-resource potential projects could become cost effective based on transmission costs. Today's technologies are used for modeling, but efficiencies and technologies will be improved as transmission is built. Current technology will be balanced with future technology. This consideration does not change the competitiveness of one area vs. another.
- The group agreed that the criteria used are not applicable to the entire market, and asked for more granularity between regions (e.g. between S. CA and Pacific NW).
- Large-scale solar PV and distributed solar PV do not have a resource screen.

Wind Resource

Ryan Pletka presented criteria and definitions for wind. Ryan showed a no-exclusions map and a preliminary-lands exclusions map (with leftover potential). Land exclusions will change with E&L WG inputs.

Discussion items:

- Class 4: Class 3 wind could supplement Class 4 wind (current criterion) where applicable. Wind speed class 3: 6.7 m/sec; Class 4: 7.5m/second; Class 5: 8m/second.
- 50m hub height: 50m hub height was validated through the Western Interconnect and therefore used as the criterion rather than 80m. 100m data could be used when validated. Hub height criteria will change cost estimates, but not resource location. The group expressed that 80m hub height would be most useful.
- Canadian stakeholders indicated that they could provide wind resource mapping data to demonstrate developable wind in Canada. **NREL will discuss this with Claude Mindorff, in order to access Canadian wind data.**
- Although some states have advanced data, this is a regional process and data needs to be comparable across states and countries. **NREL will present to the ZITA WG a proposal on how to handle varying levels of data and public vs. private data.**
- The group expressed concerns that maps do not reflect the resources that they are confident exist. The technical team will work through these issues and come back with updates maps.
- **Developers were asked to come forward with site-specific data (NREL can protect private data) in order to fill the resource maps. The ZITA WG and NREL will share a deadline for submitting data.**

Hydro Resource

Ryan Pletka presented criteria and definitions for hydro. Julie Keil and Jeff Leahy developed and vetted the hydro definitions.

Discussion items:

- INL provided data for U.S. resources between 1 – 15 MW. Hydro will not define zones, but will help shape a zone resource profile and strengthen zones. The definition provided is for U.S. and Canadian hydro. British Columbia (BC) is treated differently because of its hydro resource.
- Although hydro exclusions might not apply to national parks, REZs will not be built around national parks.
- **Richard Smart will provide revisions to the hydro definitions.**

Biomass Resource

Ryan Pletka presented criteria and definitions for biomass. There are multiple biomass uses, so the tentative modeling assumption is that 1/3 of biomass is dedicated to electricity generation. The biomass definitions are iterative and stakeholders can provide additions, if needed.

Discussion items:

- Biomass will add value to a REZ, rather than define it. Biomass faces few transmission obstacles, as the resource is a distributed resource and can be easily built near the grid.
- Co-firing and co-generation will not be considered for this process, as these activities already exist near transmission.
- Black & Veatch will seek to incorporate Canadian biomass maps.
- No criterion exists to account for the geographic distance raw materials travel to a plant.
- Beetle kill resources are not renewable. **WGA will procure data on beetle kill from**

USDA.

Geothermal Resource

Ryan Pletka discussed criteria and definitions for geothermal. The Geothermal Energy Association (GEA) has provided guidance on the documents in order to reflect the full breadth of the resource; incorporate all data available on heat flow maps, EGS maps, co-production, and geothermal potential; and effectively develop CSAs. GEA will provide continued input into the process.

Discussion items:

- There exists large geothermal potential on BLM lands in NV. There are many near-term applications being explored. UT and ID will also be considered.
- Geothermal potential on the U.S./Mexico border is not included on the map.
- Google.org just invested \$10 million into geothermal R&D.

The ZITA WG split into four groups and developed draft CSAs based on draft resource potential maps. After drawing draft CSAs, each group presented their draft CSAs and associated selection criteria. The group developed the following list of *rough draft* CSA selection criteria:

- Concentration of resources
- Singular resources
- Diurnal profiles (overlap between day and night, or other complementary gap factors)
- Need to reach all states
- Potential markets
- Potential information missing
- Concentration along the coast
- Location of large utilities
- Water power in BC
- Areas of potential overlapping resources
- Target resource locations that are not dependent on collectors or feeders
- Include CSAs that have multiple technologies
- Use of biomass and hydro to supplement a technology
- Multiple resource areas or CSAs that feed into an existing line
- Resource displacement from the marketplace

On Day 2, the WGs revised the list and brainstormed some criteria that may be applied to the CSA to create proposed REZs.

- 500MW “chunks”
- Concentration of resources (high capacity leads to economies of scale in transmission planning, to a certain point)
 - Extra potential in a CSA - study area should contain “x” times the needed potential (e.g. 5 times needed potential for 2,000MW of transfer capability, so 10,000 MW potential needed, resource dependant).
- Multiple resources in one area
 - Highest quality of resources
 - Complementary characteristics in terms of load demand
 - Potentially higher line utilization
 - Reliability
 - Not exclusionary of single-resource zones
- Geographic diversity that supports capacity
 - All states contain CSAs/CSA parts

- Political reasons
- Economic benefits
- Economics:
 - Cost of collector system
- 10 years out on the project timeline

Day 2 – Tuesday, September 23, 2008

8:15 a.m. – 12:00 p.m.

Joint ZITA WG and E&L WG Workshop

Participants: ZITA WG and E&L WG (see participant list at end of document)

Amanda Ormond and Lisa Szot, ZITA WG Co-chairs, presented to the E&L WG the ZITA WG resource criteria and definitions and the draft CSA maps. The purpose of developing draft CSAs is to visualize areas of resource potential, identify preliminary concerns, and to graphically display potential options. The draft CSA maps presented explore possible CSAs based on the criteria that each group developed. The Technical Committee will be presented with a refined draft of the CSAs and associated issues and questions.

Discussion items:

- The group decided that state REZ information will be added to draft CSA maps, but final REZ maps will not show state zones. State resources are still valid for the purpose for which they are created from within and around the state. WREZ will add to that.
- The group should consider preliminary environmental exclusions, e.g. sagebrush habitat.
- Areas of least environmental conflict will be refined.
- The WREZ process will build upon regional hubs of transmission and distribution to strengthen the system. Transmission built will be flexible.
- CSAs with dispersed profiles need to be modeled. Renewables should not compete for one trunk system.
- ZITA will intervene with the Generation and Transmission Modeling Work Group (Modeling WG) to evaluate all issues raised.
- Carl Zichella indicated that disturbed/Brownfield lands are ideal for REZ development, as disturbed sites exist in high quality wind resource areas. This is not yet an E&L WG screen, but this consideration could reduce the lands controversy by using lands that are already disturbed. Development of Brownfield areas could be cheaper and quicker, and could provide a competitive advantage.
- CSAs include both public and private lands.

Pam Eaton and Brian Weber, E&L WG Co-chairs, presented to the ZITA WG on the E&L WG Initial Exclusion Areas. The E&L WG identified all lands that are currently excluded from development by either state or federal regulations, as well as lands that are not prohibited, but sensitive and should be avoided. There is an iterative process between the E&L WG and states for data sharing. The E&L WG will strive to provide the ZITA WG clarity in output.

- The co-chairs will work on mitigation and monitoring together, and environmental prioritization issues.
- The human element of the WREZ process will also be considered (e.g. cultural, historical archaeological resources), and will be reflected in the maps.
- The E&L WG has a fixed group to ensure representation from all different groups (industry, developers, NGOs).

Discussion items:

- The WREZ process is linked to the WGA Wildlife Corridors Initiative, that highlights landscape-scale conservation plans for multiple species. The Wildlife Corridors project formed a Wildlife Habitat Council that will provide input into the process early on. The lessons learned in the Wildlife Corridors project will be carried forward into the WREZ process.
- All E&L criteria will be in GIS format. GIS information will be solicited for legal and regulatory criteria. There are resources that are not yet “mapable,” but will be as the process moves forward. Many NGOs are developing GIS maps.
- The E&L WG is not making assumptions on the future of environmental resources (e.g. due to climate change). Assumptions are based on data currently available.
- The group needs to prevent “analysis-paralysis.” WGs will develop deliverables within a set timeframe, and take any additional concerns to the Technical Committee.
- Adaptive Management Plans can help determine how land responds to change.
- The E&L WG has not considered environmental “tipping points” for various resources. The first step is to determine how much can technically be placed in an area. The second step will be an avoidance/mitigate/minimize analysis.
- The E&L WG will identify areas with the least amount of controversy and the largest potential. There are trade-offs for all zones associated with mitigation initiatives – this will affect the supply curve. The end cost of the modeling exercise will inform areas of highest potential, both resource-based and financially-based.

Doug Larson and Tom Carr presented on behalf of the Generation and Transmission Modeling Work Group on the status of the model development, ZITA and E&L inputs, getting resources to load centers and cost models.

PowerPoint available at (Generation and Transmission Modeling Work Group Presentation - Doug Larson, WIEB): <http://westgov.org/wga/initiatives/wrez/enviro/meetings/index.htm>.

Discussion items:

- LSEs will ultimately decide what transmission gets built. A model is being developed to assist resource planners, LSEs, PUCs, and other stakeholders to evaluate the “attractiveness” of REZs.
- In order to keep the model functional, the number of CSAs needs to be low.
- A central point within a REZ will inform the distance to the existing right of way, and distance to a load zone. Load zones are flexible.
- Default assumptions include a 500 KV line, a time period, and costs of current technologies. Other cost-factor combinations will be considered.
- Phase II will involve sub-regional planning groups and WECC.
- Renewable resources and their generation costs are compared to other resources. An adjustment factor for integration costs will impact regulatory changes. Integration costs for wind and other ancillary services are market adjustments and specific to each load zone depending on the generation mix.
- The economics of the collector system will be determined at a later date.
- Data for wind and solar are broken down by 10 minute increments.

Ryan Pletka presented an overview of the supply curve analysis. PowerPoint (Overview of Supply Curve Process - Ryan Pletka, Black & Veatch) available at:

<http://westgov.org/wga/initiatives/wrez/enviro/meetings/index.htm>. The supply curve analysis applies preliminary criteria screening to all resources and will be developed from ZITA WG and E&L WG inputs. CSAs result from land areas superimposed with land exclusions. Black & Veatch is not modeling transmission within a zone, but making cost assumptions depending on

that zone with the assumption of distance.

Discussion items:

- The supply curve is a tool to visualize data combinations of cost and supply with technology, resource and timeline assumptions. All assumptions will be outlined in the report to the Governors.
- Assumptions could be made regionally, as resource potential in each state can fluctuate based on supply, demand and transmission cost.
- There can be a trade-off between transmission and resource class. Resource class does not always supersede cost.
- Resource potential within a zone will be higher than what is actually needed for transmission, to ensure competition within a zone.
- Mitigation costs and land costs will be factored into the supply curve and in the modeling.

The three WGs determined data needs from each other:

- From the E&L WG to the ZITA WG:
 - Other exclusions areas mapped
 - Constraints on different resources (“exclusions”)
 - Mitigation costs
 - Environmental ranking
 - List of sensitive area
 - How to handle disturbed lands?
 - How to address dynamic changes?
 - Presentation on Brownfield approach
 - GIS information for exclusionary areas
- From the ZITA WG to the E&L WG:
 - What information is needed to further define the CSAs zones?
 - How should the ‘human’ element be handled?
 - Will zones incorporate buffers?
 - How is mitigation defined?
 - How to handle water resources?
- From the ZITA WG to the Modeling WG:
 - Cost assumptions
- From E&L WG to Modeling WG:
 - Sensitive areas

Next steps:

- **WGs to communicate information needs to respective WGs.**
- **WGs to review information that was shared, and communicate any questions or concerns to WGA, and if necessary, provide language to meeting their needs.**
- **WGA to draft an agenda for the Oct. 15-16 Technical Committee meeting.**
- **If needed, participants to review WGA website has groundrules, work plans and assumptions for all WGs.**
- **It was suggested that DOE and WGA secure more resources to compile data and maps, and that everyone become familiar with the WCI.**

12:45 – 3:00 p.m.

ZITA Work Group Meeting

Participants: ZITA WG (see participant list at end of document)

The group discussed whether to altogether eliminate exclusion areas or just sensitive areas from REZ consideration. The group would like to see the areas identified and impact on the CSAs before incorporating the exclusions into the supply curves. This may be an issue that will go to the Technical Committee for clarification. Considerations include that:

- Many legal exclusions are not contiguous large blocs.
- A REZ should not be excluded unless the exclusion becomes a significant percentage of the developable land.
- A certain MW goal could help eliminate areas of environmental concern and precisely define areas of high quality that are developable.
- Economic screens will also eliminate some areas.

The ZITA WG finalized CSA selection criteria (list above).

- Criteria are different for CSAs than for REZs. All zones will contain more than 500 MW.
- The optimal size for REZs is under 100 miles x 100 miles.
- BV will present the intuitive circles that facilitate screen analysis, and will focus on the darker color areas (higher resource concentration).
- The highest caliber resource will be identified (as well as any buffer zones), and the criteria used will pare down the CSAs. What is not mapped on the draft CSA maps does not contain a resource.
- Lisa and Amanda will take the maps to the Technical Committee. Technical Committee will approve the CSAs and the ZITA WG will then create criteria to narrow the CSAs into proposed REZs.

The ZITA WG discussed ZITA input requirements from the ZITA WG to the Modeling WG.

- ‘Generation type and technology’ is the only needed now. That data can be provided through a ZITA WG subgroup to discuss proxy technologies. **BV will provide the group with proposed proxy technologies and schedule a conference call to discuss them.**
- The Modeling WG indicated that users will be able to change assumptions in the model.
- **The ZITA WG will need help from Canada on financial equivalencies.**
- Regional cost variances for different technologies: The Modeling WG needs generic cost numbers that can be adjusted regionally. Modeling will be less flexible with more detail and granularity.
- Water: Cost values will not be put on water, but different water needs for each technology will be factored into the model, to be determined later.
- Mitigation: The technology team will determine how to handle mitigation. Mitigation could be a relatively small cost, but some projects could be designed to avoid mitigation. The ZITA WG will have to determine if they want to factor in mitigation costs.
- Where possible, assumptions should be monetized, in order to model different costs.
- Black & Veatch will come back to the ZITA WG with proposed variables.

The ZITA WG discussed items for discussion by the Technical Committee

- **Black & Veatch will come back to the ZITA WG with clean and precise maps that integrate environmental exclusions. There will be a webcast before the Technical Committee meeting to review the maps.**
- It was recommended that WGA follow the EIS process to review impacts to historical sites and impacts to tribal lands. Consultation with tribes will be ongoing, and assisted by Paul Orbuch (consultant) and Karen Deike (WGA).
- Rationale behind each data source will be clearly referenced in the maps.
- The GIS portal (Mercator/NREL website) shows exclusion areas.
- **Technical Committee Meeting Agenda Items:**

- How many MW should be planned for?
- Are there other exclusions to plan for?
- Should federally and statutorily excluded areas be eliminated altogether?
- How to handle critical habitat?
- How should mitigation costs be handled?

ZITA WG Action Items, Parking Lot Items and Next Steps

Day 1 Action Items Review:

1. Amanda Ormond to discuss Mexico tribal contacts with Roger Fragua (COTA).
2. Peter Brehm (Infinia Corp.) to work offline with the ZITA WG to bring forward data demonstrating different insulations, to further evaluate 5KW/m²/day potential.
3. Solar resource: consider 5KW/m²/day, and consider use of troughs.
4. Wind resource: consider 80m hub height for Canada and 80m addition to 50m hub height, where applicable; procure Canadian wind data (Claude Mindorff to help).
5. Hydro resource: Richard Smart to edit hydro definitions.
6. Biomass resource: Add Canadian biomass data; consider forest thinning, residue and biogas within a REZ; and WGA to procure data on beetle kill from USDA.
7. ZITA WG to develop background rationale for each technology and seek review by renewable energy advocates.
8. By Oct. 15 – 16 Technical Committee meeting ZITA WG to develop a list of all data sources used to develop the CSA maps.
9. NREL to present to the ZITA WG a proposal on how to handle varying levels of data and public vs. private data.
10. Developers to come forward with site-specific data to fill resource maps.

Day 1 Parking Lot:

- How to handle distributed resource integration issues?
- How to handle differences among U.S., Canada and Mexico data?
- How to handle potential demand analysis?
- Smaller technology-focused work groups will work directly with BV, with resource leaders within each caucus.

Next Steps for the ZITA WG:

- The Facilitation Team will debrief and send a schedule, next steps, and proposed approach for interacting with the E&L WG and the Modeling WG.
- There will be a ZITA WG call before the Technical Committee meeting to review revised CSA maps.
- There will be a ZITA WG call after the Technical Committee meeting to discuss proxy technologies.
- There will be an opportunity for public comment on the proposed REZs, likely in February. REZs will be defined around April, and a report on Phases I and II will be presented to the Governors at their Annual Meeting in June.

Appendix: Meeting Participants

Last Name	First Name	Organization	Affiliation
Arenson	Steven	Air Force Western Regional Environmental Office	ZITA WG
Arnold	Abby	Kearns & West	Facilitator
Bartridge	Jim	California Energy Commission	E & L WG
Benjamin	Charles	Western Resource Advocates – Nevada	ZITA WG
Berry	Jason	Utah State Energy Program	ZITA WG
Blair	Cory	E.ON Climate & Renewables	ZITA WG
Bonnyman	Sue	BC Ministry of Energy, Mines and Petroleum Resources	E & L WG
Brehm	Peter	Infinia Corp.	ZITA WG
Campbell	James	PacifiCorp	ZITA WG
Carr	Tom	Western Interstate Energy Board	Modeling WG
Cox	Craig	Interwest Energy Alliance	ZITA WG
Cox	Tyler	NARP	E & L WG
Crist	Patrick	NatureServe	E & L WG
Dansby	Mark	Agua Caliente Band of Cahuilla Indians	ZITA WG
Darin	Tom	Western Resource Advocates	Tech. Committee
Davis	Linda	Western Governors' Association	WGA
Deike	Karen	Western Governors' Association	WGA
Deora	TJ	Horizon Wind	E & L WG
Eaton	Pam	The Wilderness Society	E & L WG
Everett	Kevin	Power Engineers, Inc.	E & L WG
Finn	Josh	Black & Veatch	Technical Team
Firooz	Sharon	First Wind	ZITA WG
Fisher	Todd	NARP	ZITA WG
Fragua	Roger	COTA	ZITA WG
Gough	Bob	Intertribal COUP	ZITA WG
Greenman	Celia	Colorado Division of Wildlife	E & L WG
Halvey	Rich	Western Governors' Association	WGA
Haubenstock	Arthur	BrightSource Energy	E & L WG
Helinski	Ron	AWWI	E & L WG
Higginbottom	Ed	BC Transmission Corporation	ZITA WG
Hurlbut	Dave	NREL	Technical Team
Hurshman	Tom	BLM	E & L WG
Inmann	Pam	Western Governors' Association	WGA
Jenkinson	Stewart	TransCanada Corp.	ZITA WG
John	Eric	SkyFuel Inc.	E & L WG
Joyce	Kevin	Black & Veatch	Technical Team
Kauffman	Rebecca	Southern Ute Growth Fund	ZITA WG
LaBray	Shay	PacifiCorp	ZITA WG
Larson	Doug	Western Interstate Energy Board	Modeling WG
Lausten	Mark	DOE Solar/Sentech	ZITA WG

LeBeau	Tracey	Council of Energy Resource Tribes	ZITA WG
Lehr	Ron	AWEA	ZITA WG
Levin	Julia	National Audubon Society	E & L WG
Lindenberg	Steve	U.S. DOE	ZITA WG
Luna	Chuck	EDAW	ZITA WG
McCaul	John	Geothermal Energy Association	ZITA WG
Mindorff	Claude	Mainstream Renewable Power LLC	ZITA WG
Molvar	Erik	Biodiversity Conservation Alliance	E & L WG
Moss	Patrick	Northern Arapaho Tribe	ZITA WG
Murray	Mark	Tri-State Generation and Transmission Association, Inc	E & L WG
Nakafuji	Dora	Lawrence Livermore Nat'l Lab	ZITA WG
Nelson	Greg	PNM	ZITA WG
Nickell	Brad	WECC	ZITA WG
Orbuch	Paul	Orbuch Consulting, LLC	Facilitator
Ormond	Amanda	Ormond Group LLC	ZITA WG
Orton-Palmer	Amelia	U.S. Fish and Wildlife Service	E & L WG
Paskevic	Heather	ESRI	E & L WG
Piszcalski	Martin	Sextant Research	ZITA WG
Pletka	Ryan	Black & Veatch	Technical Team
Poncelet	Morgan	Kearns & West	Recorder
Rutledge	Brian	Audubon Wyoming	E & L WG
Schwartz	Howard	WA CTED	ZITA WG
Scott	Lincoln	Northern Arapaho Tribe	ZITA WG
Singleton	Will	Singleton Strategies, LLC	Facilitator
Sison-Lebrilla	Elaine	Sacramento Municipal Utility District	ZITA WG
Smart	Richard	Community Hydropower Consulting	ZITA WG
Steinbach	Ron	Tri-State Generation and Transmission Association, Inc	E & L WG
Stuart	Robert	BrightSource Energy	ZITA WG
Sullivan	Tim	The Nature Conservancy, CO	E & L WG
Sylvester	Carl	ESRI	E & L WG
Szot	Lisa	NM RETA	ZITA WG
Tashakkori	Cyrus	E.ON Climate & Renewables	ZITA WG
Taylor	Joe	Xcel	ZITA WG
Tilghman	Henry	Vestas	ZITA WG
VanDerZee	Jonathan	Horizon Wind Energy	ZITA WG
Van Norman	Janine	USFWS National Wildlife Refuge System	ZITA WG
Weber	Brian	PacifiCorp	E & L WG
West	Madeleine	Western Governors' Association	WGA
White, Sr.	Steven	Northern Arapho Tribe	ZITA WG
Yourkowski	Cameron	Renewable Northwest Project	ZITA WG
Zichella	Carl	Sierra Club	E & L WG