

Western Renewable Energy Zones Initiative - Phase 3

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Western Resource Planners Forum

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The Regulatory Assistance Project

China ♦ EU ♦ India ♦ United States

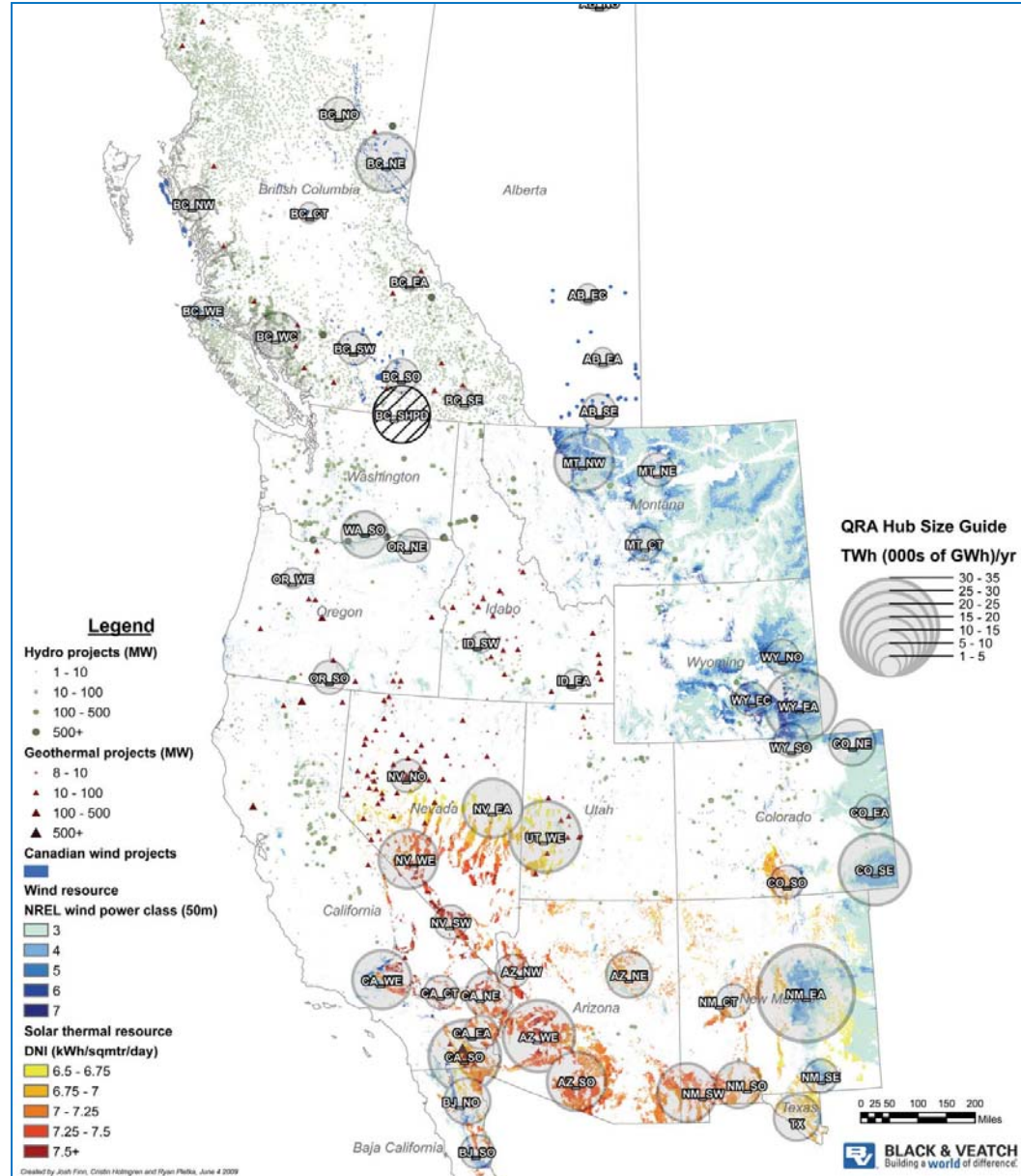


About the Regulatory Assistance Project

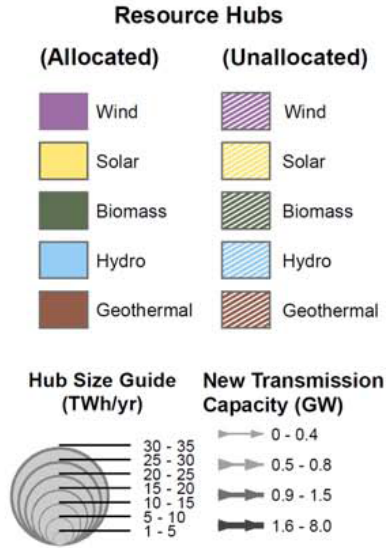
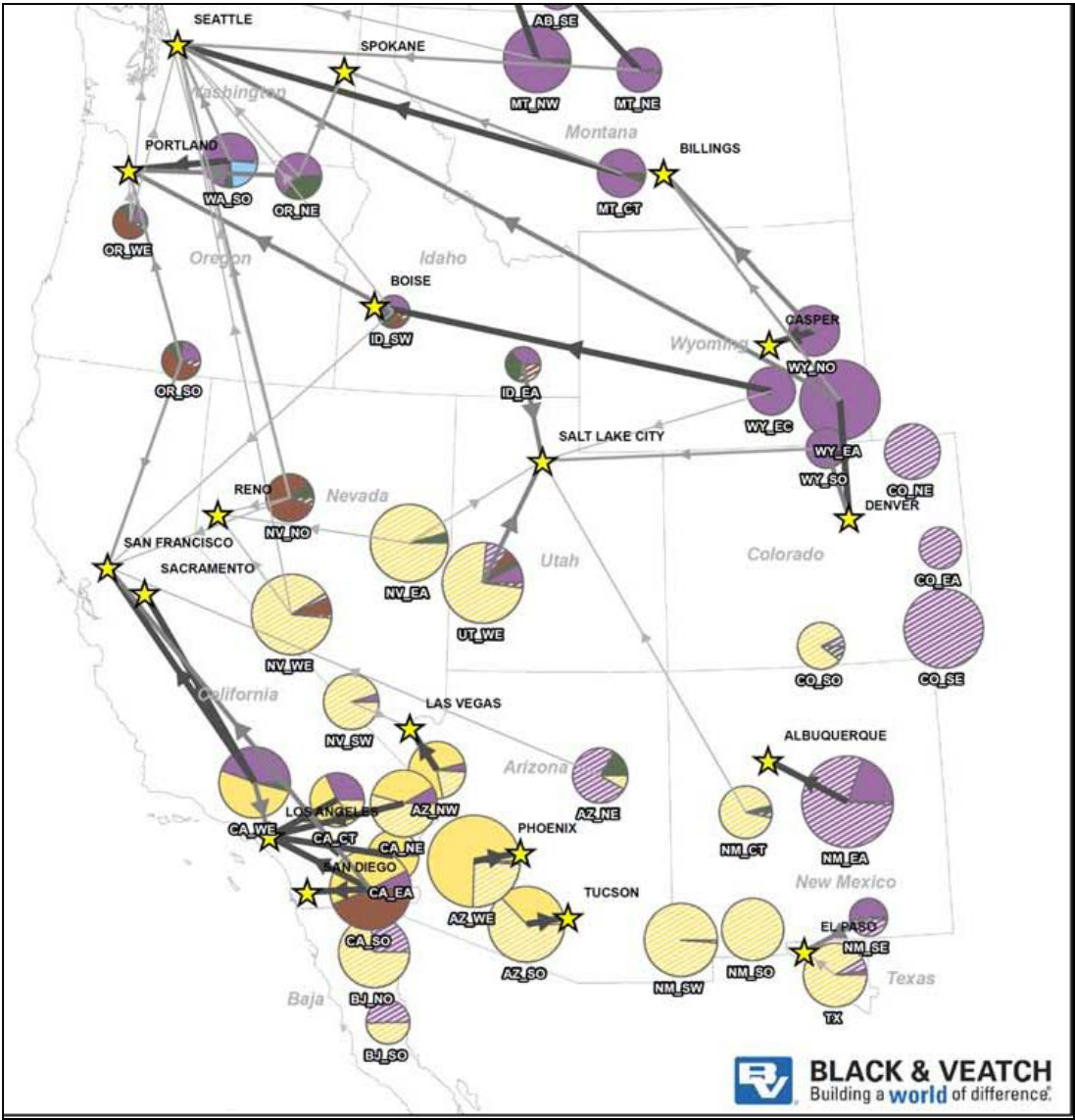
- RAP is a nonprofit organization providing technical and policy assistance to government officials on energy and environmental issues.
- RAP also provides educational assistance to other stakeholders, including consumer and environmental groups, utilities and business associations.
- RAP principals and senior associates all have extensive regulatory experience.
- We are funded by foundations and federal agencies.
- We have worked in nearly every state and many nations throughout the world.

WREZ Phases 1 and 2

- Map renewable-rich zones
- Produce resource supply curves by zone
- Develop delivered cost model



WREZ Delivered Cost Model: Transmission and Least-Cost REZ Resources Under a 33% Renewable Energy Target



Notes: Under base case assumptions in 2029. Size of hub reflects total resource potential; filled-in portion represents amount procured by a load zone. Map by Black & Veatch based on modeling by Lawrence Berkeley National Laboratory.

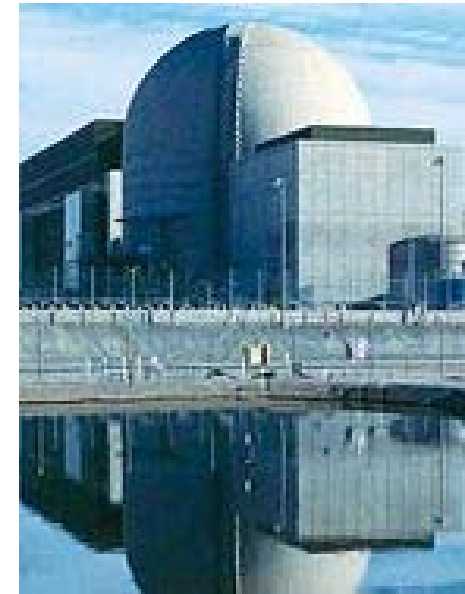
What's Next?

- Phase 3 - Engage state regulators and utilities in facilitating development from REZs to assist construction of interstate transmission lines
 - Transmission will not be built unless enough buyers want renewable energy at the end of the line (and along the way).
 - *Synchronizing procurement of renewable energy by load-serving entities interested in the same zone can create a critical mass of transmission needs in the same timeframe to justify a properly sized line.*
- Funded by USDOE



We Have Done This Before: Generation Examples

- Palo Verde Nuclear Generating Station
- Colstrip Generating Station
- Bridger Generating Station
- Navajo Generating Station
- Four Corners Generating Station
- San Juan Generating Station
- Intermountain Power Project



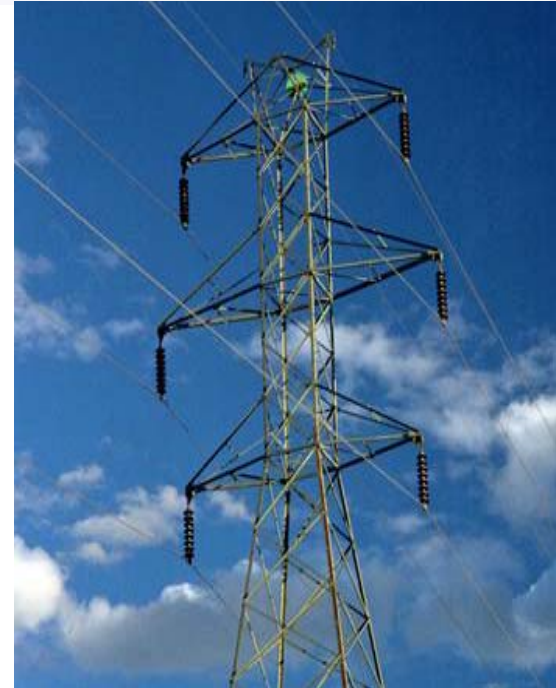
Source: Rob Kondziolka, Salt River Project

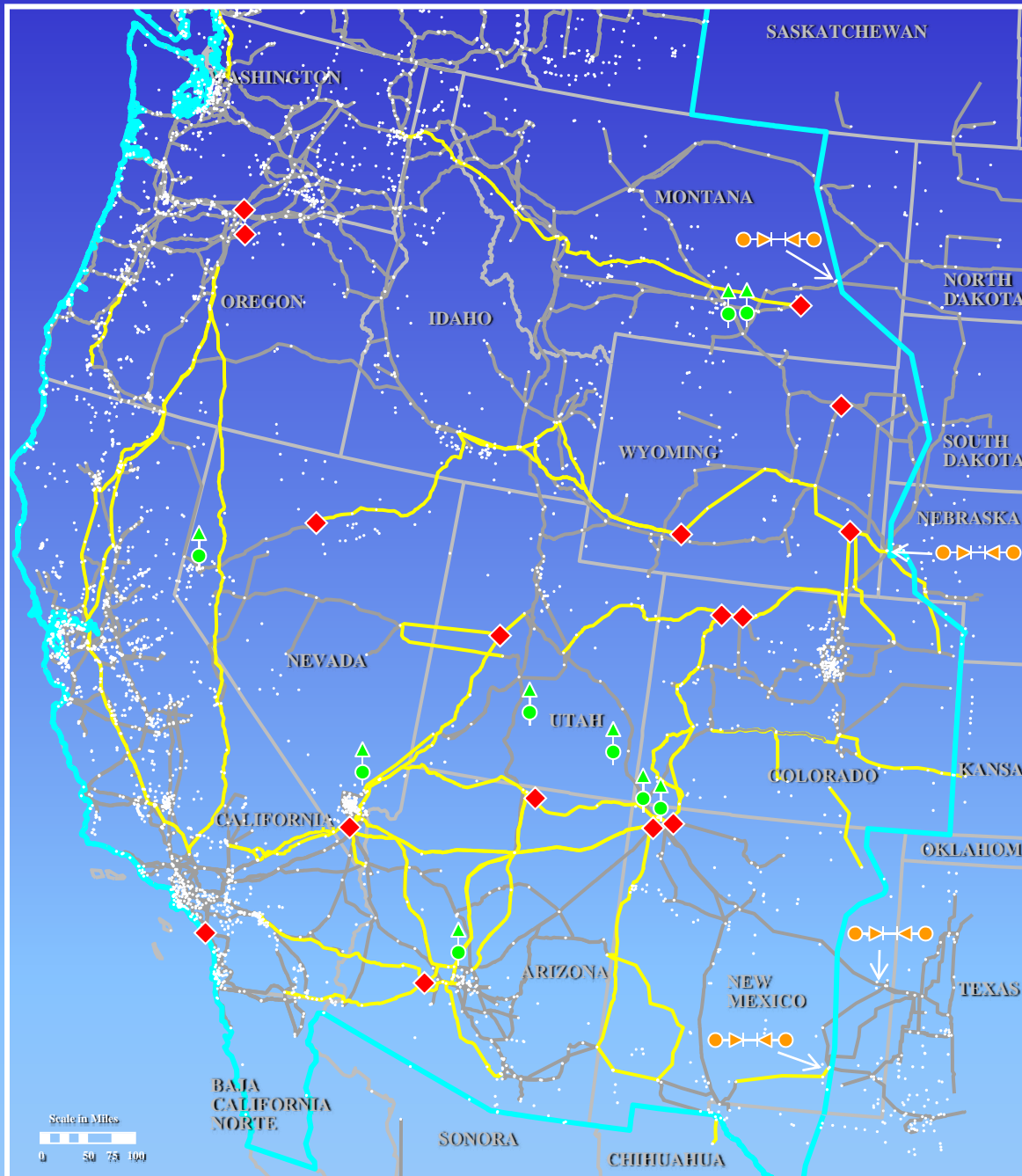
We Have Done This Before: Transmission

- Palo Verde Transmission System
- Navajo Transmission System*
- AC Pacific Intertie*
- DC Pacific Intertie*
- Southwest Power Link*
- San Juan to Vail*
- Colstrip Transmission System*
- Intermountain Power Project DC Transmission Line*
- Mead-Phoenix* and Mead-Adelanto*

* **Interstate transmission lines**

Source: Rob Kondziolka, Salt River Project





WECC JOINT FACILITIES (DEVELOPED OR OWNED)

LEGEND:

- WECC BOUNDARY
- ▶◀○ JOINT DC TIES
- ▲
● JOINT PHASE SHIFTER OPERATION
- JOINT LINES
- ◆ JOINT POWER GENERATION

Courtesy
Rob Kondziolka,
Salt River Project

What's Different Now? A Few Real or Perceived Barriers

- Development of wind, solar and geothermal instead of coal, nuclear and hydro
 - Remote, fast and modular (mismatch with transmission), often PPA
- Electric industry structure
 - Independently owned G&T
 - Functional separation of G&T within utility
- Increased risk of cost recovery
 - G&T projects by others may call into question whether your project is used and useful
 - Earlier-than-expected power plant retirements may free up transmission capacity for renewable resources
- Capital and financing





What's Different Now? A Few Real or Perceived Barriers *(cont.)*

- Siting and cost allocation issues
- Issues with variable energy resources
 - Transmission capacity requirements, low load hours, lack of flexible supply and demand resources, fledgling imbalance energy markets, etc.
- Regulatory uncertainty – RPS, carbon, RECs
- Resource planning/acquisition requirements
 - Reduced utility flexibility, extended and less predictable timelines

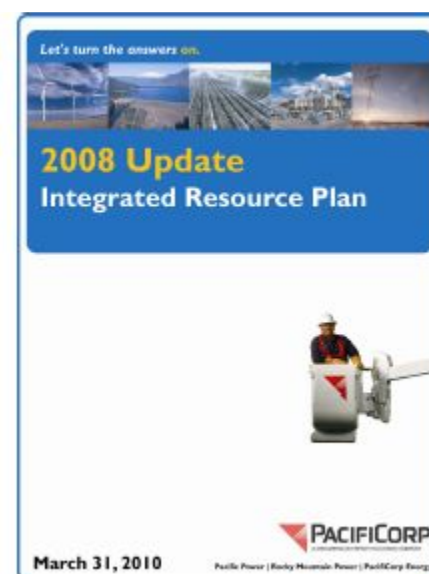


Some Advantages of Cooperation Across Utilities & Jurisdictions

- Greater economies of scale
- Reduces cost and risk
- Pooling of financial resources
- Matches multi-state transmission projects
- Reduces project timing/lumpiness issues
- Broader participation increases public acceptance of proposed projects
- Supports cost allocation processes

Proposed Approach to WREZ 3

- Review LSE resource plans to identify:
 - Planned renewable resource acquisitions
 - Resource types
 - Procurement schedules
 - REZs of interest and reasons why
 - Associated transmission
- Draft list of LSEs' preferred zones
 - Ask LSEs to specify preferences
 - Reconcile IRP data and utility data submitted to WECC and fill gaps
 - Use delivered cost model under various scenarios
- Electronic mapping of WREZ hubs, preferred zones, load areas and procurement plans
- Long-term view needed



Proposed Approach to WREZ 3 *(cont.)*

- Survey regulators and utilities - Identify barriers to resource development in REZs and potential solutions; collect procurement schedules
- Produce a report synthesizing WREZ 3 information and survey findings, with recommendations
- Facilitate multi-state discussions organized by zones of common interest; reach agreements on addressing barriers to resource development in REZs of mutual interest
- Report on discussion group results and recommendations
- Opportunities for other stakeholders to participate
- Monitor procurement schedules for new opportunities





Session 8 Discussion Will Cover These Questions

1. Should we aim to maximize development in REZs of mutual interest across utilities? If so, how do we go about doing that?
2. Can states and utilities working together across jurisdictions help address barriers to REZ development and joint transmission projects?
3. Does the proposed approach to WREZ Phase 3 make sense? If not, how can we make WREZ 3 useful?
4. Do the REZs generally, and LBNL model results specifically, match up with where you are planning to acquire new resources over the *long term*? Do you see other potential utility partners? Do the LBNL results match your utility's view of renewable resource mix and development zones under conditions specified in the base case and scenario runs?
5. How do proposed transmission projects match up?
6. Do you expect to see large-scale development of solar resources in the Southwest as the WREZ model suggests? Will PV change everything?



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RAP is committed to fostering regulatory policies for the electric industry that encourage economic efficiency, protect environmental quality, assure system reliability, and allocate system benefits fairly to all customers.