

# JOINT MILITARY AFFAIRS COMMITTEE

**September 17, 2009**

**Daniel N. Schochet  
Ram Power, Inc.  
Chairman RETAAC Phase II  
WGA WREZ Technical Committee**



## **Excerpt from June 2008 executive order by Gov Gibbons**

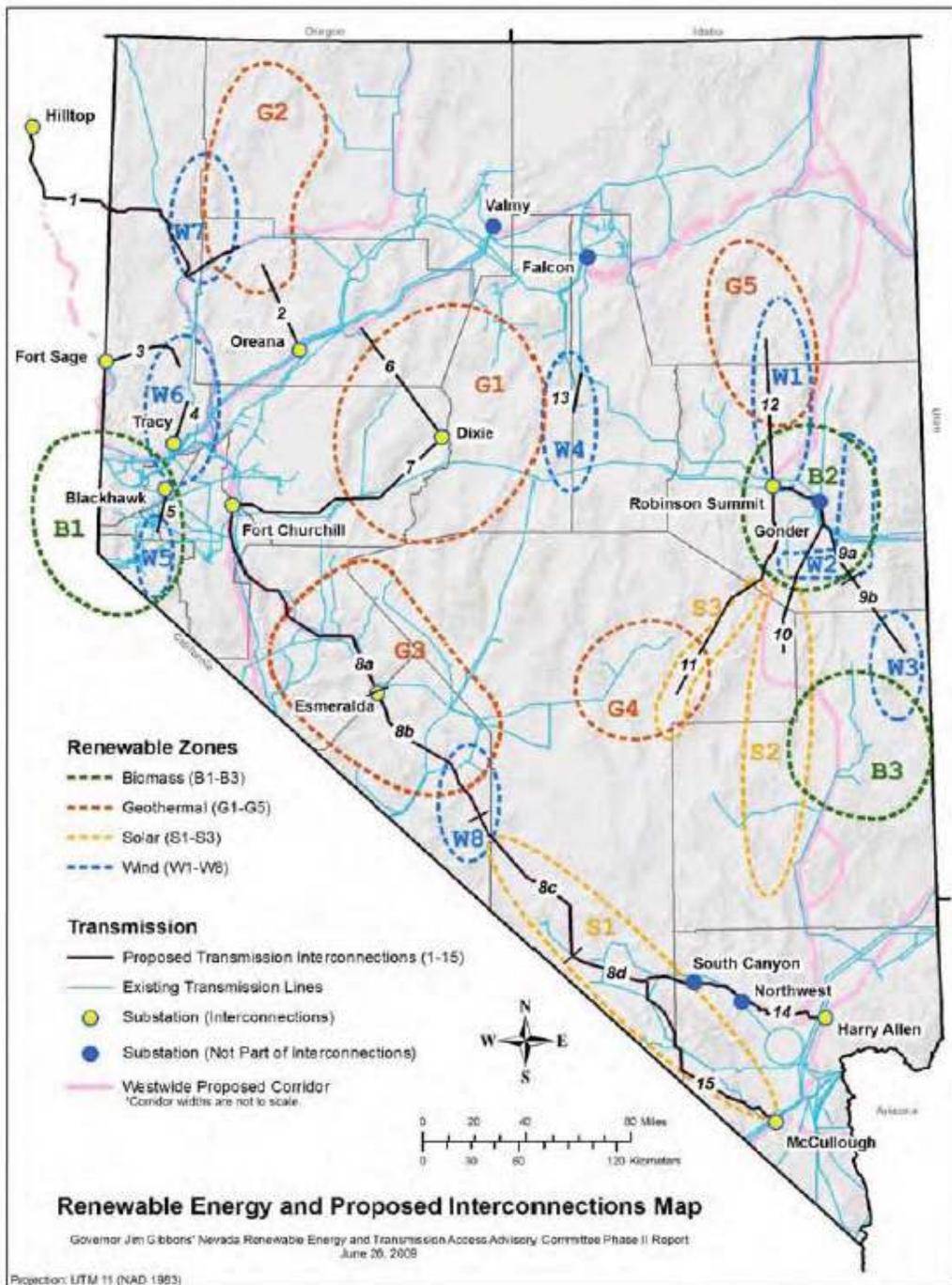
### **❖ RETAAC II shall:**

- **determine the power potential capacity for each renewable energy zone that is available for commercial development;**
- **investigate land use and permitting constraints;**
- **identify routes that can accommodate immediate construction of transmission lines while avoiding constraint areas;**
- **determine the cost and revenue structure of transmission lines based on supply curves; and**
- **identify and rank lines that are feasible to build; address the financing mechanisms to build these lines and collector systems; and provide related policy recommendations.**

# RETAAC PHASE II

## Findings of Study Groups

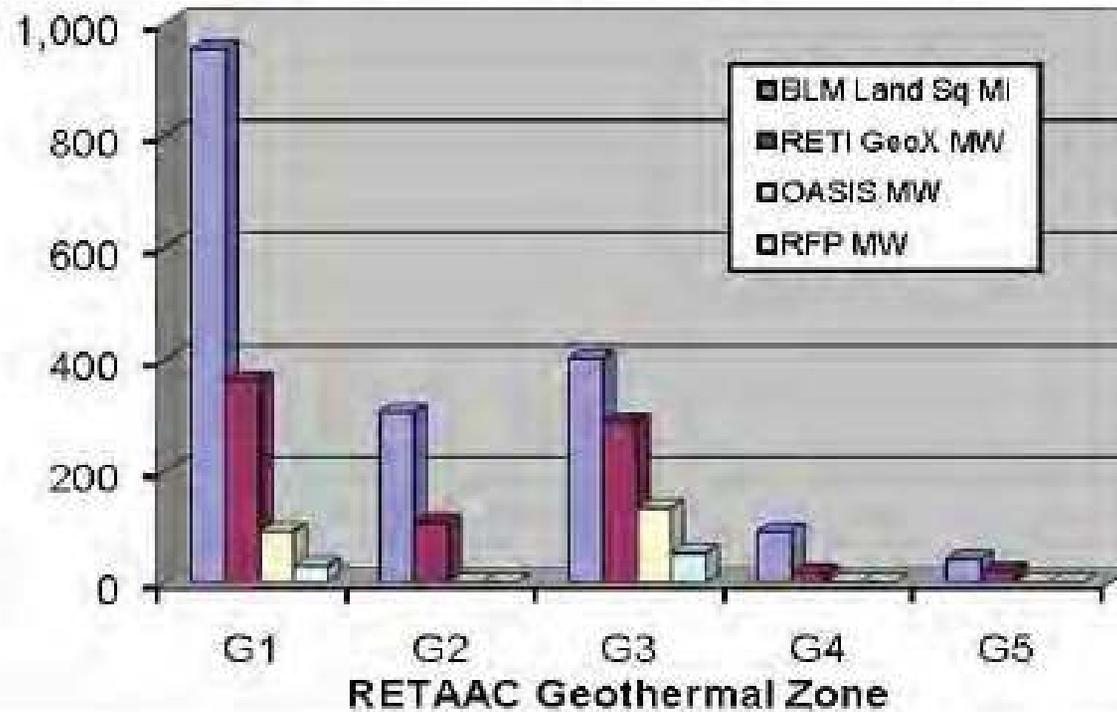
- a) **Renewable Energy Zones-** *Prioritizations of these REZs, which include 1500 MW additional geothermal, more than 5000 MW of Solar and over 1000 MW of wind, served as the basis for the analysis by the Economic Feasibility Study Group.*
- b) **Environmental, Land Use-** *After evaluating available secondary data collected for this project and consulting with representatives from land management agencies, no fatal flaws were identified for the proposed interconnections.*
- c) **Economic Feasibility Question -** *how much does a transmission developer need to charge to recover investment and O&M: Results were that certain T lines could charge acceptable fees and recover the costs if usage were fully subscribed*
- d) **Transmission for Export –** *Task to identify transmission to export from Nevada renewable resources to adjacent states. Results indicate that a significant market exists in California and Arizona for Nevada’s renewable energy and transmission paths are feasible.*
- e) **Feasibility Criteria -** *The Feasibility Criteria Study Group was tasked with drafting the Recommendations, based on findings of Study Groups, for the RETAAC approval*



**Transmission Map  
Showing REZs &  
Collector Lines,  
Based on Avoiding  
Constraint Areas**

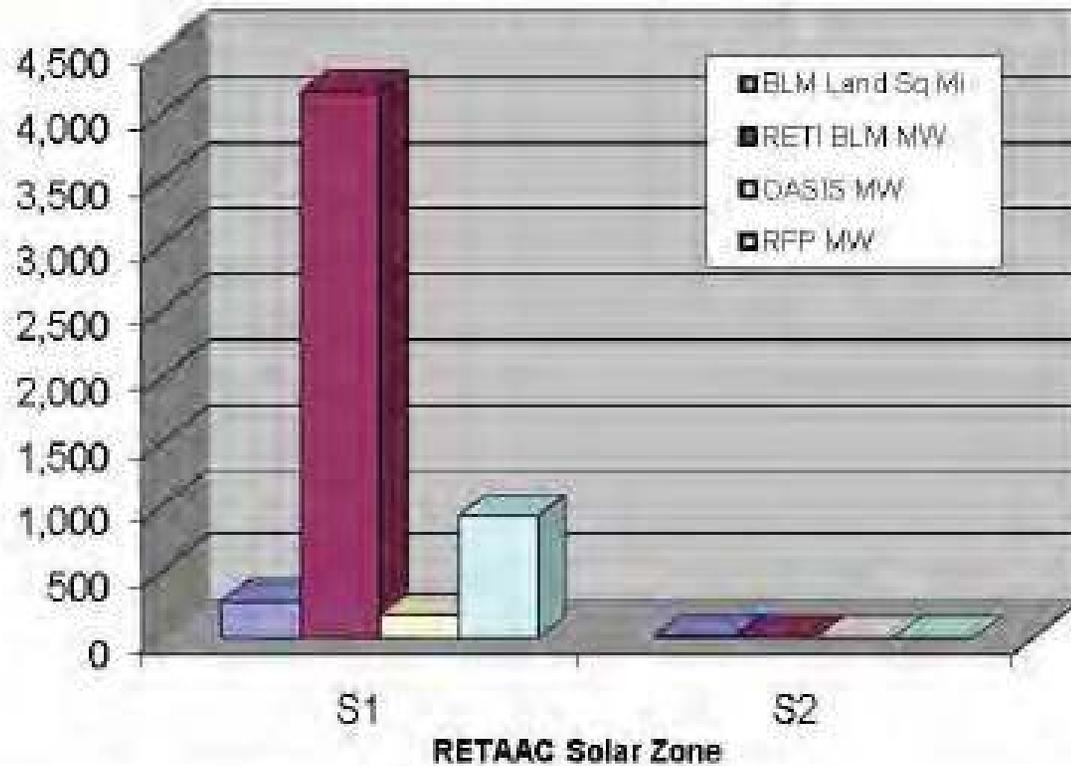
**From RETAAC  
Phase II Report**

## Geothermal Zones Summary



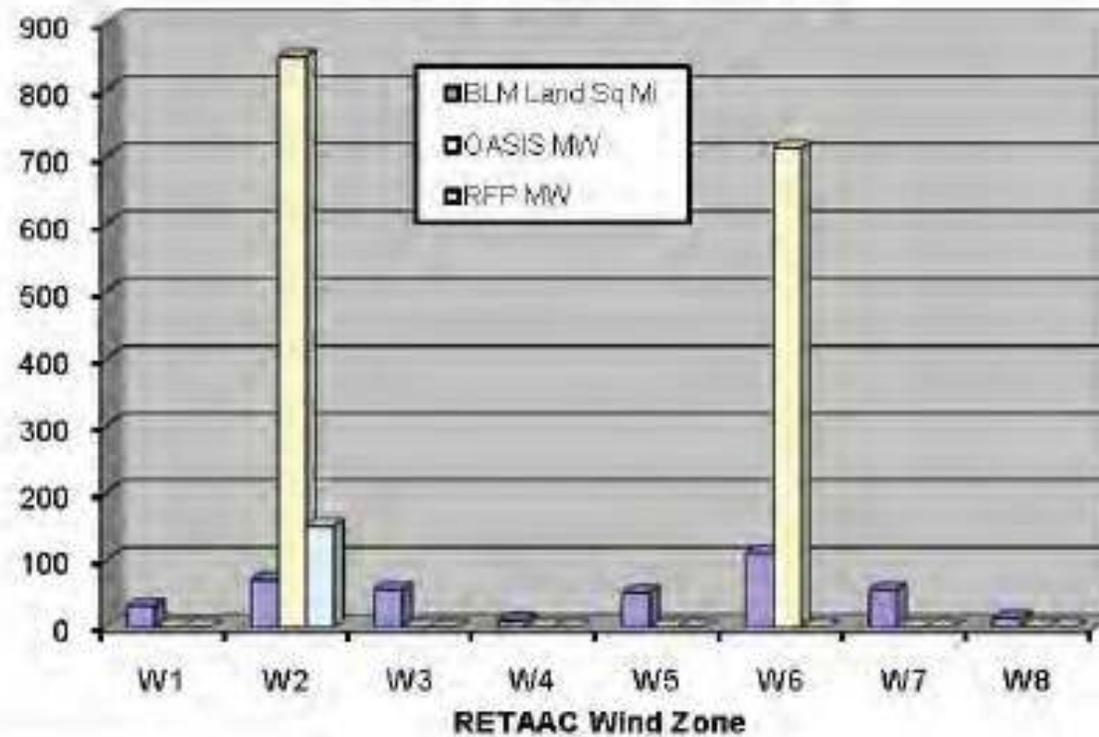
Geothermal Zones	G1	G2	G3	G4	G5
Land (Est'd Sq Mi)	953	306	402	91	42
RETI GeoX MW	362	108	288	16	20
OASIS MW	92	0	133	0	0
RFP MW	30	0	53	0	0
Est. MW Range:	350-400	100-150	250-300	50-100	50-100

### Solar Zones Summary

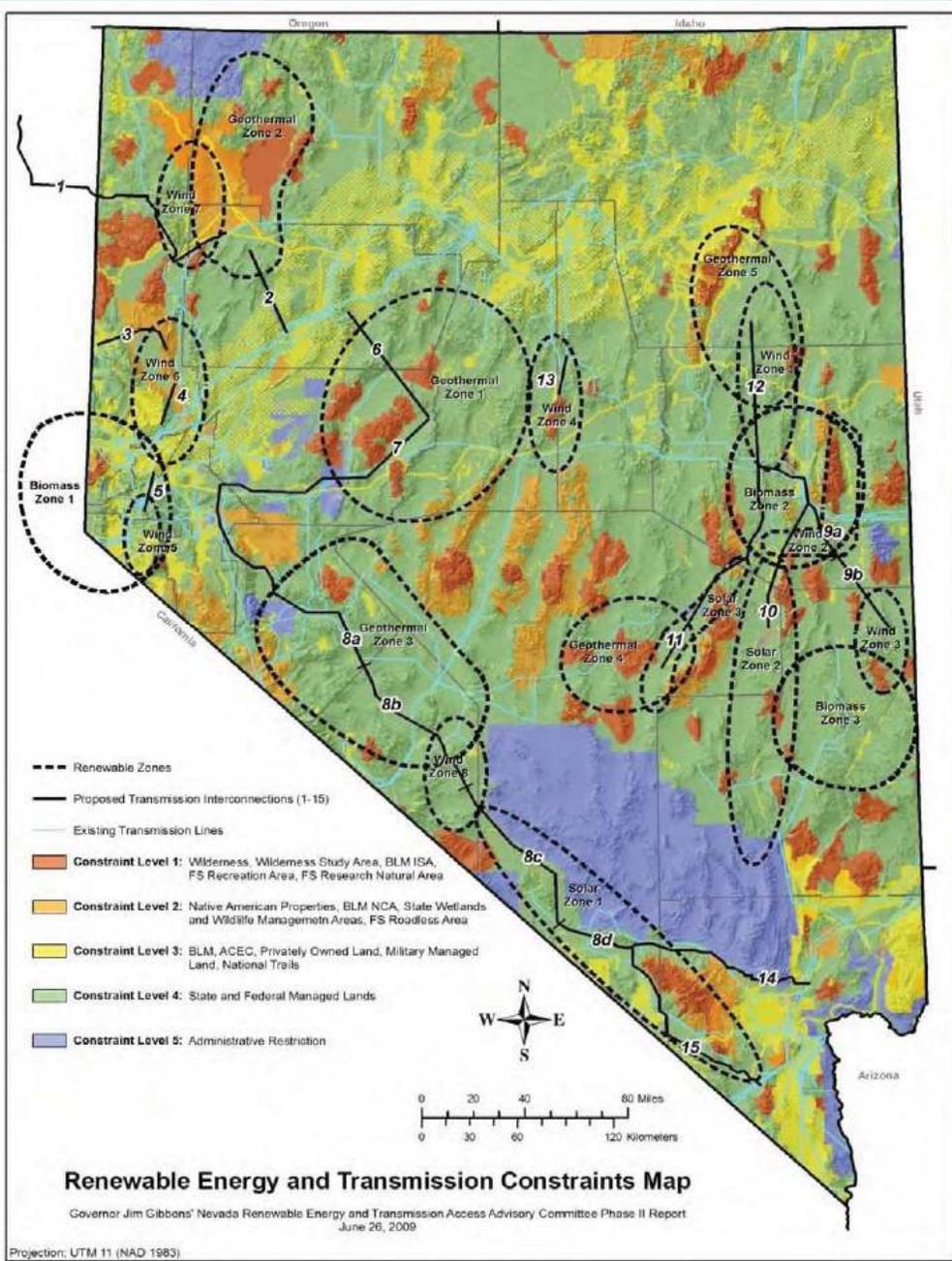


Solar Zones	S1	S2
BLM Land Sq Mi	275	16
RETI BLM MW	4,168	0
OASIS MW	175	0
RFP MW	923	0
Est. MW Range:	4-5,000	UNK

## Wind Zones Summary



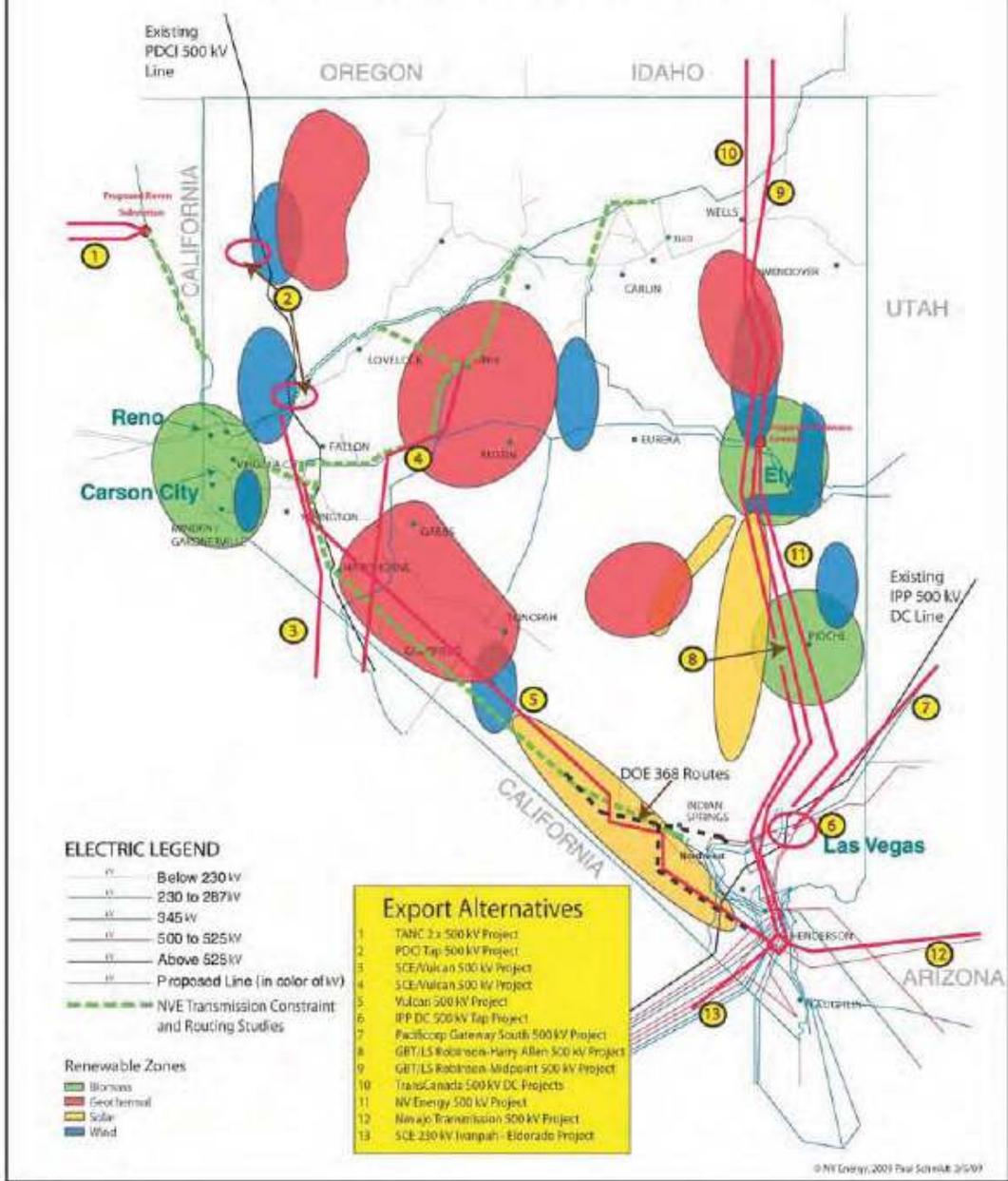
Wind Zones	W1	W2	W3	W4	W5	W6	W7	W8
BLM Land Sq Mi	32	70	56	10	51	110	55	13
OASIS MW	0	848	0	0	0	712	0	0
RFP MW	0	150	0	0	0	0	0	0
Est. MW Range:	50-100	800-900	300-400	50-100	50-100	500-700	50-100	0



## Transmission Map Showing REZs & Constraint Areas

From RETAAC Phase II Report

# Nevada New Export Alternatives



**Transmission Map Showing Export Alternatives to Export Nevada's Renewable Energy**

**From RETAAC Phase II Study Group**

## Analysis of Renewable Energy Transmission Costs With 100% Utilization

Transmission Segment	Zone	Terminals	Construction Cost (\$million)	Length (Miles)	MW Limit	Bond Financing	Bond/Stock Financing
						Monthly Rate (MW)	Monthly Rate (MW)
9A	W-2	Robinson	\$118.1	54	1,000	\$670	\$940
8D+14	S-1	Harry Allen	\$358.0	110	3,000	\$680	\$960
9A+9B	W-3	Robinson	\$176.9	96	1,000	\$990	\$1,410
5	W-5	Blackhawk	\$18.8	17	100	\$1,060	\$1,500
8D+15	S-1	McCullough	\$417.3	116	2,000	\$1,180	\$1,670
10	S-2	Robinson	\$221.7	128	1,000	\$1,250	\$1,770
4	W-6	Tracy	\$47.0	20	200	\$1,320	\$1,880
2	G-2	Oreana	\$26.8	37	100	\$1,510	\$2,140
13	W-4	Frontier	\$55.2	17	200	\$1,560	\$2,210
3	W-6	Ft. Sage	\$58.9	34	200	\$1,660	\$2,360
8A	G-3	Ft. Churchill/Blackhawk	\$163.3	98	500	\$1,840	\$2,610
12	W-1	Robinson	\$81.9	61	250	\$1,840	\$2,620
12	G-5	Robinson	\$81.9	61	250	\$1,840	\$2,620
7	G-1	Ft. Churchill/Blackhawk	\$167.5	103	500	\$1,890	\$2,680
8A+8B	W-8	Ft. Churchill/Blackhawk	\$216.0	160	500	\$2,430	\$3,450
8A+8B+8C	S-1	Ft. Churchill/Blackhawk	\$273.9	234	500	\$3,080	\$4,370
8C+8D+14	W-8	Harry Allen	\$127.9	184	200	\$3,600	\$5,110
8C+8D+15	W-8	McCullough	\$131.5	190	200	\$3,700	\$5,250
11	G-4	Robinson	\$112.5	97	150	\$4,210	\$5,990
6	G-1	Oreana	\$120.9	54	150	\$4,500	\$6,440
1	G-2	Hilltop	\$82.4	131	100	\$4,630	\$6,580

Excerpt from Economic Analysis presented to RETAAC by Dr. Yasuji Otsuka/PUCN

## RETAAC II RECOMMENDATIONS

1. Renewable energy access to the grid is facilitated by a robust and reliable statewide transmission system, serving all load customers from all available and potential generation sources
2. Tax exempt bond financing should be used to reduce the cost of constructing new transmission facilities and enhance economic feasibility.
3. The PUC, should employ flexibility to encourage renewable energy new renewable transmission construction, by considering:
  - the impacts of economic development in the approval of new transmission,
  - flexibility in financing of new transmission construction, and
  - the requirements of the state's utilities to meet Nevada's RPS mandate.
4. Renewable transmission should be designed and constructed by entities with the financial capacity, the expertise, & the experience in Nevada issues .
5. State should create “one stop shop” to assist providers in overcoming permitting & siting constraints to the construction of transmission facilities.
6. Nevada should work with new and existing state and federal statutes to seek additional resources to further the recommendations of this report.

# RETAAC CONCLUSIONS

1. Nevada has abundant Renewable Energy Resources, but some new Transmission will be required to access these resources,
2. Low cost financing may be available, major Issue is how to generate revenue stream to repay transmission financing.
3. Construction of new lines is economically feasible in many cases,

# Western Governor's Association

Western Renewable Energy Zones (WREZ) Project  
Initiated May 2008

## The WREZ charter laid out four goals:

1. Develop a framework for consensus among the states and provinces within the Western Interconnection on how best to develop and deliver energy from renewable resource areas to load centers.
2. Generate reliable information for use by decision makers that supports the cost-effective and environmentally sensitive development of renewable energy in or near certain identified renewable energy zones, as well as the conceptual transmission plans needed to deliver the renewable energy to load centers.

3. Provide a foundation for interstate collaboration on commercial delivery of renewable energy to meet growing demand throughout the Western Interconnection.
4. Provide for the development of cost-effective renewable resources in order to promote the clean and diversified energy goals of the Western governors.

# WREZ Committees:

- **Steering Committee**, composed of governors, premiers and public utility commissioners. DOE, DOI, DOA, and FERC
- **Technical Committee**, composed of renewable energy and transmission experts, environmental groups, governmental agencies and representatives of three working groups below.

The bulk of the effort has been accomplished by the three working groups

- The **Zone Identification and Technical Analysis (ZITA)** was charged with developing the resource characteristics or criteria that would ultimately define the zones. By applying the technical screening criteria described below, ZITA identified areas for utility scale renewable energy development and combined that information with known restrictions relating to land use (including engineering limitations), regulatory mandates (or limitations) and environmental concerns.

• **The Environment and Lands (E&L) working group** was responsible for categorizing the resource potential of zones based on land use, wildlife and other environmental considerations.

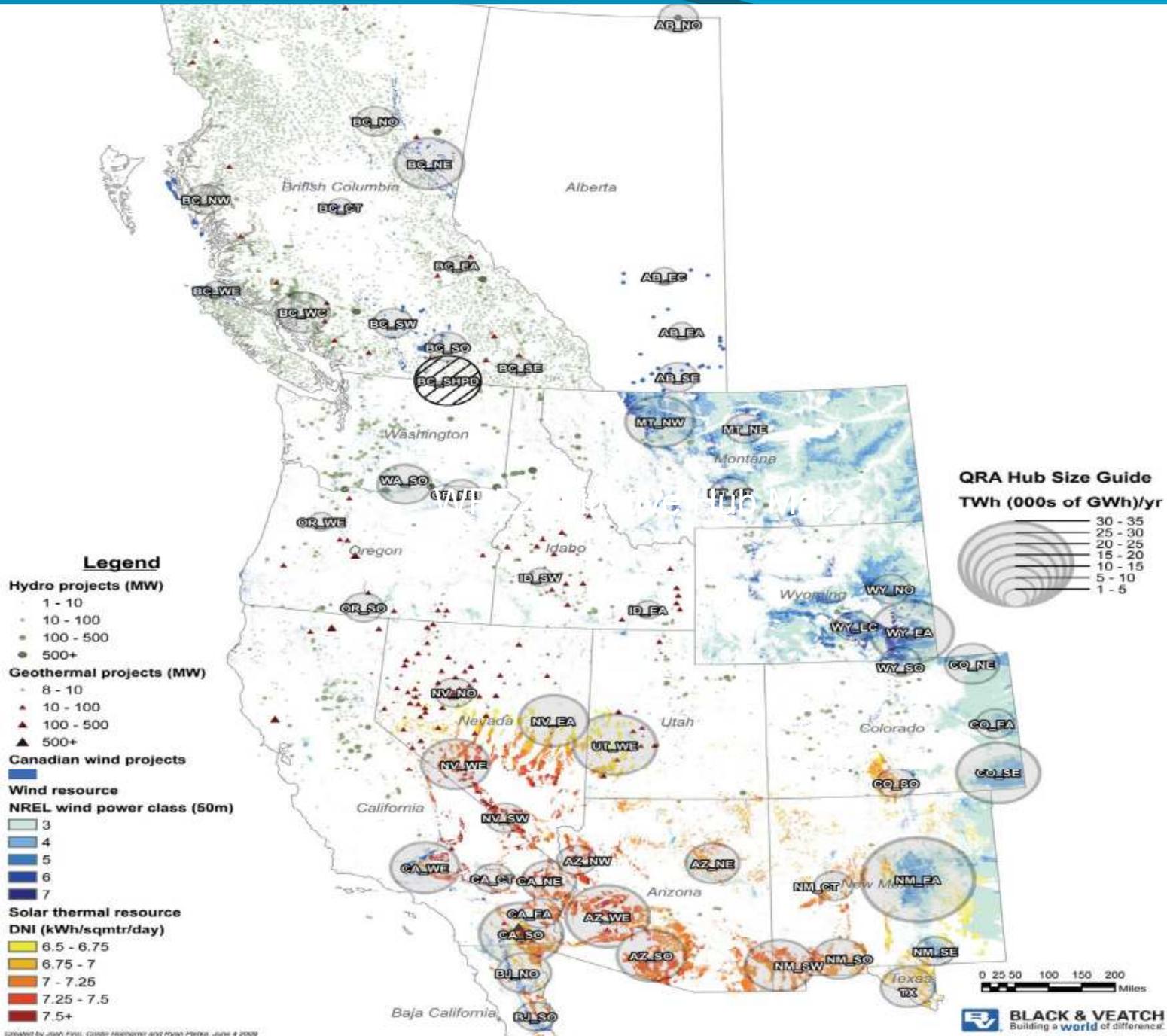
• **The Generation and Transmission Modeling (G&TM) working group** was charged with developing a user-friendly model to enable evaluation of economic attractiveness of the renewable resources and engaging the Western Electricity Coordinating Council (WECC), which oversees the transmission grid in the Western Interconnection, in a planning process to study transmission needed to move power from the zones to load centers.

The ZITA working group determined that the minimum size of a Qualified Resource Area should:

- Have electrical generating potential to justify a 500 kV AC transmission line,
- Minimum of 1,500 MW for variable resources with moderate capacity factors, such as wind and solar,
- Maximum radius of 100 miles from the geographic center of a Qualified Resource Area.

<http://www.westgov.org/wga/initiatives/wrez/index.htm>.

# WREZ Initiative Hub Map



# NEVADA STATISTICS

	GWH/YR	SOLAR	WIND	GEOTH	HYDRO	BIOMASS	TOTAL
NV EAST		17,382	-	168	-	995	18,546
NV NORTH		-	-	7,799	-	991	8,799
NV SOUTH		7,916	581	-			8,584
NV WEST		16,741	503	2,074	-	161	19,479

# CONTINUING WORK:

## Phase 2: Forging Transmission Plans

Finalize the modeling tool that estimates the relative economic attractiveness of delivering energy from Western Renewable Energy Zones to specific load centers across the Western Interconnection.

## Phase 3: Coordinating Energy Purchasing from the WREZs

## Phase 4: Fostering Interstate Cooperation for Renewable Energy Generation and Transmission