33% RPS Environmental Scoring

Presented by:
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Introduction

- Goals:
  - Score resources on a clear range for side-by-side comparison to discern project differences
  - Build on the work of RETI
  - Reflect Aspen's experiences from working in the field on environmental issues associated with renewable projects
  - Follow a system so any project can be scored

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Methodology

- Start with RETI EWG CREZ data: eight criteria
- Eliminated scoring of Environmentally Sensitive Areas (yellow & black)
  - Development in these areas not feasible
- Eliminated scoring of CREZ Environmentally Sensitive Areas buffer
  - Not proven by project experience (ex. Genesis Solar Energy Project)

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Methodology Continued

- RETI Energy Development Footprint: EWG identified land needed for renewable energy collection and electric generation
  - Scoring formula included all area directly impacted by energy development
  - Updated to include only the portion of footprint not previously disturbed [ex. mechanically disturbed agriculture lands discounted]

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Methodology Continued

- EPA Tracked Degraded Lands:
  - EWG considered reclaimed mine lands and brownfields using EPA, Superfund, and Department of Conservation reclaimed mine data
  - Updated to include EPA and NREL tool (2/23/10) that shows EPA and state tracked site specific information for renewable energy development.
    - Used EPA data to supplement RETI data
    - Some EPA tracked sites were discounted (active military bases)

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New Scoring Criterion or Data Added

- High Desert Ecosystems:
  - For Southeastern CA desert CREZ's
  - Using a 2,500 foot elevation contour, the CREZ located in the southern CA desert were evaluated for the portion in high desert vs. low desert
  - This highlights concerns about the sensitive habitat found in the CA high desert

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New Scoring Criterion or Data Added

- Regional Air Quality:
  - Proxy for environmental justice and public health
  - Mapped each CREZ for general location:
    - Federal PM2.5 nonattainment
    - Federal PM10 nonattainment
    - State-level ozone nonattainment

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Comparison of RETI EWG Criteria to Current Methodology

Begin with RETI Process	Aspen Environmental Scoring
Original Criteria for Ranking of CREZs from RETI EWG: 1. Energy Footprint *[Revise]* 2. Transmission ROW Footprint ~~3. Sensitive Areas in CREZ~~ ~~4. Sensitive Areas in CREZ Buffer~~ 5. Significant Species 6. Wildlife Corridors 7. Important Bird Areas 8. Land Degradation *[Revise]*	Adding the New Concerns: 1. Energy on Mechanically Disturbed 2. Transmission ROW Footprint 3. High Desert Ecosystems 4. Regional Air Quality 5. Significant Species 6. Wildlife Corridors 7. Important Bird Areas 8. EPA Tracked Degraded Lands
	Adding resource screen: Weigh the concerns for relevance to developing a given technology.

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Criteria Weighting per Renewable Technology

- Each of the eight scoring criteria was reviewed to consider the relevance of the environmental issue to each technology (wind, solar PV, geothermal, etc.)
  - Ex. Birds and bird corridors are of greater concern for wind farms than for other technologies
    - Ex. The air quality issue is of greater concern for biomass and biogas

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Relative Weight of Criteria by Technology

	Disturbed	ROW	High Desert	Air Qual	Sig Species	Corridors	IBA	EPA Tracked Degraded	Total
Biomass	1.0	1.0	0.0	2.5	1.5	0.0	0.5	1.0	7.5
Geothermal	1.0	1.0	0.5	1.0	1.0	1.0	0.5	1.0	7.0
Solar PV	1.0	1.0	1.5	0.0	2.0	1.5	1.0	1.0	9.0
Solar Thermal	1.0	1.0	1.5	0.0	2.5	2.0	1.0	1.0	10.0
Wind	1.0	1.0	0.5	0.0	1.5	1.0	2.5	1.0	8.5
PV DG Rural	1.0	0.5	0.5	0.0	1.0	0.0	0.5	1.0	4.5
Urban Ground PV	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0
Urban Roof PV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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CREZ-like Scores for Out of State and Distributed Resources

- Out of State: Environmental Scores assigned based on nearby or corridor CREZs
- Distributed Generation: Environmental Scores assigned based on nearest CREZ
  - Weighting per technology assigned to all Out of State and Distributed Resources
  - Lowest weighting given to DG technologies

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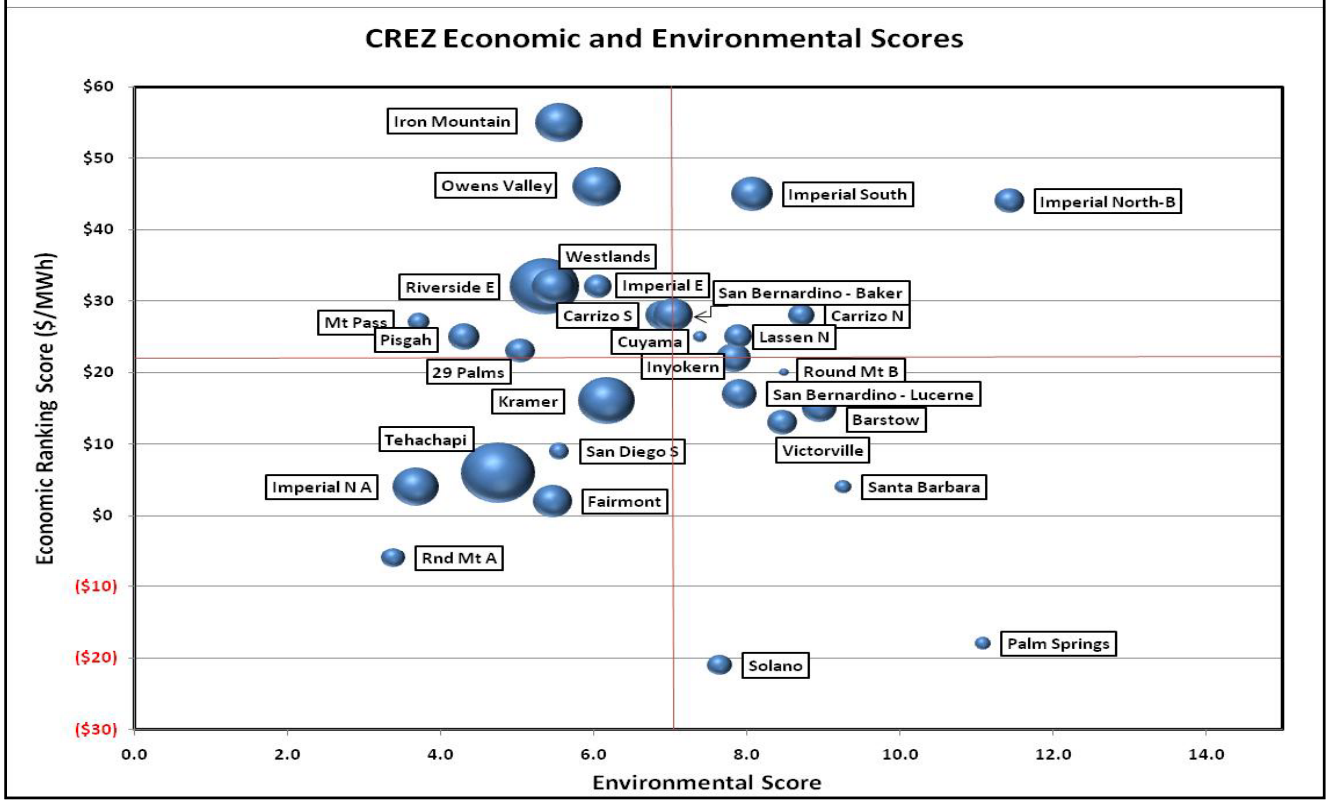
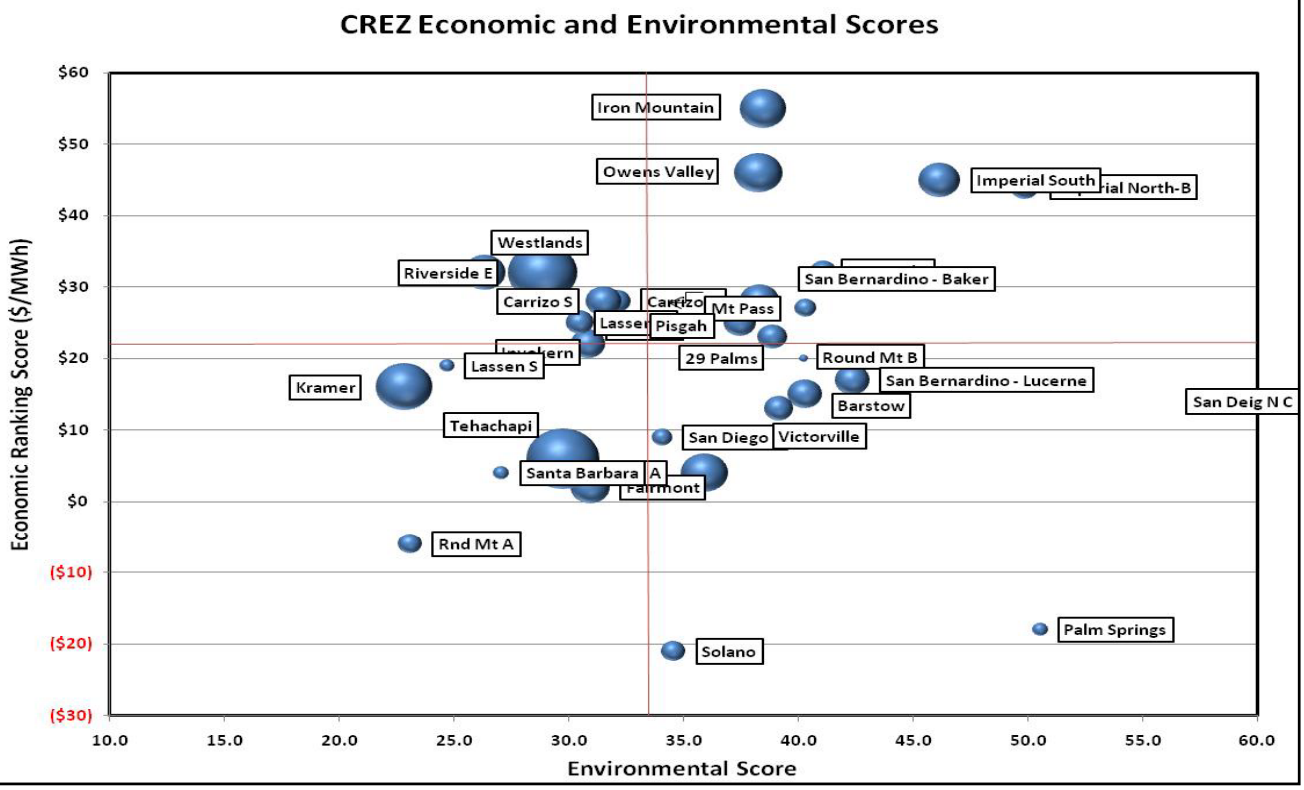
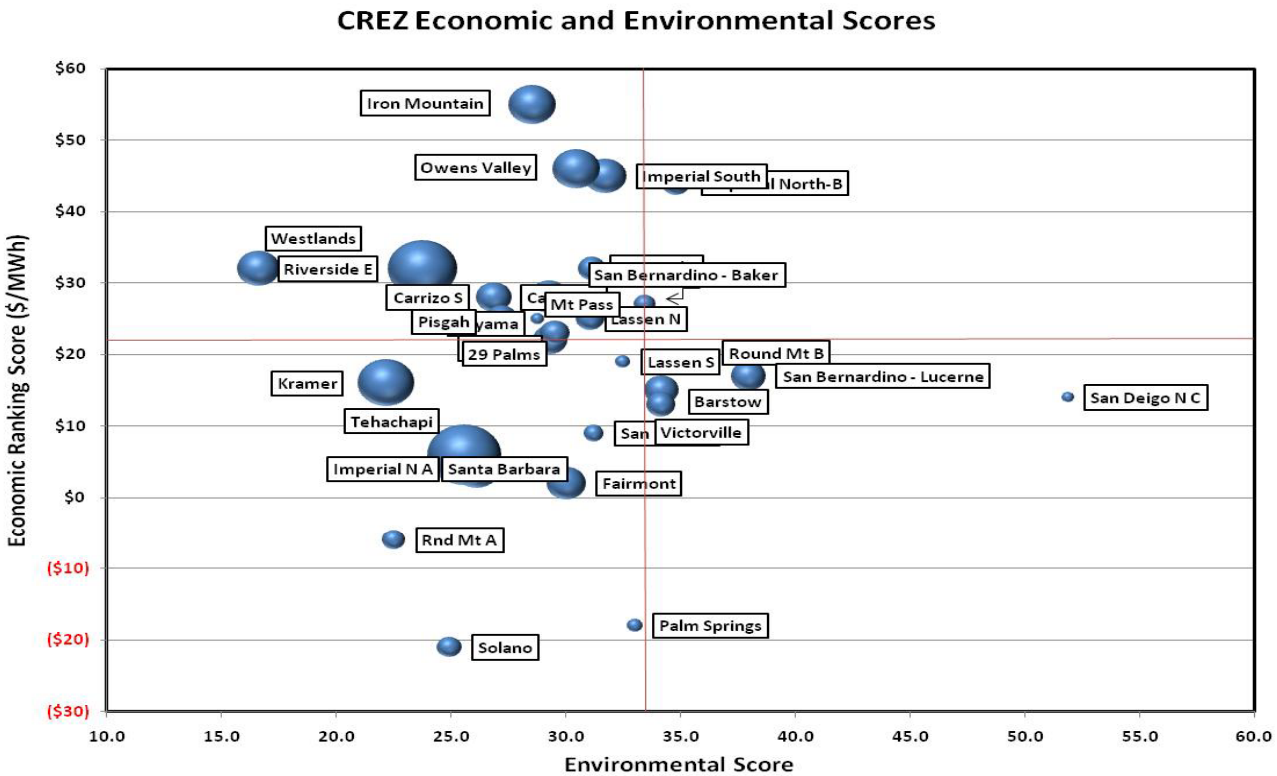
CREZ Environmental from RETI (2/18/2010)



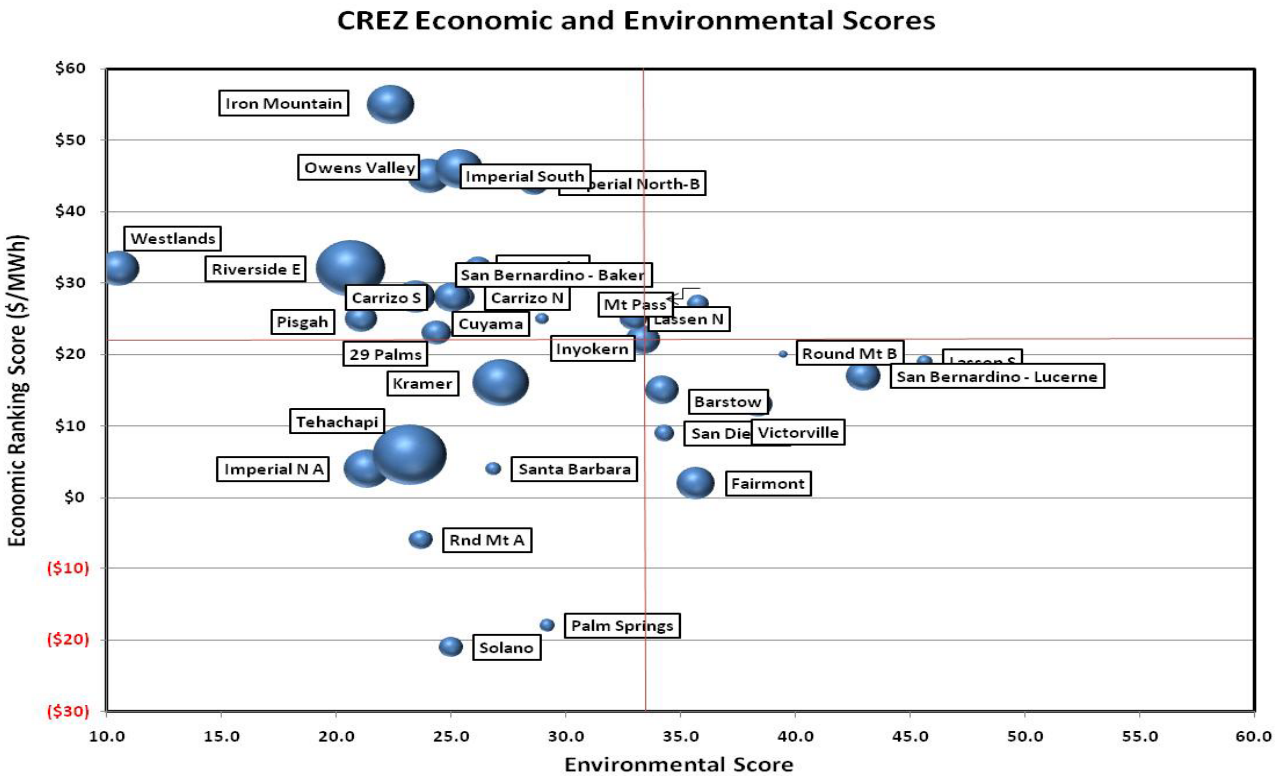
CREZ Re-ranking with Weight by Technology: Biomass



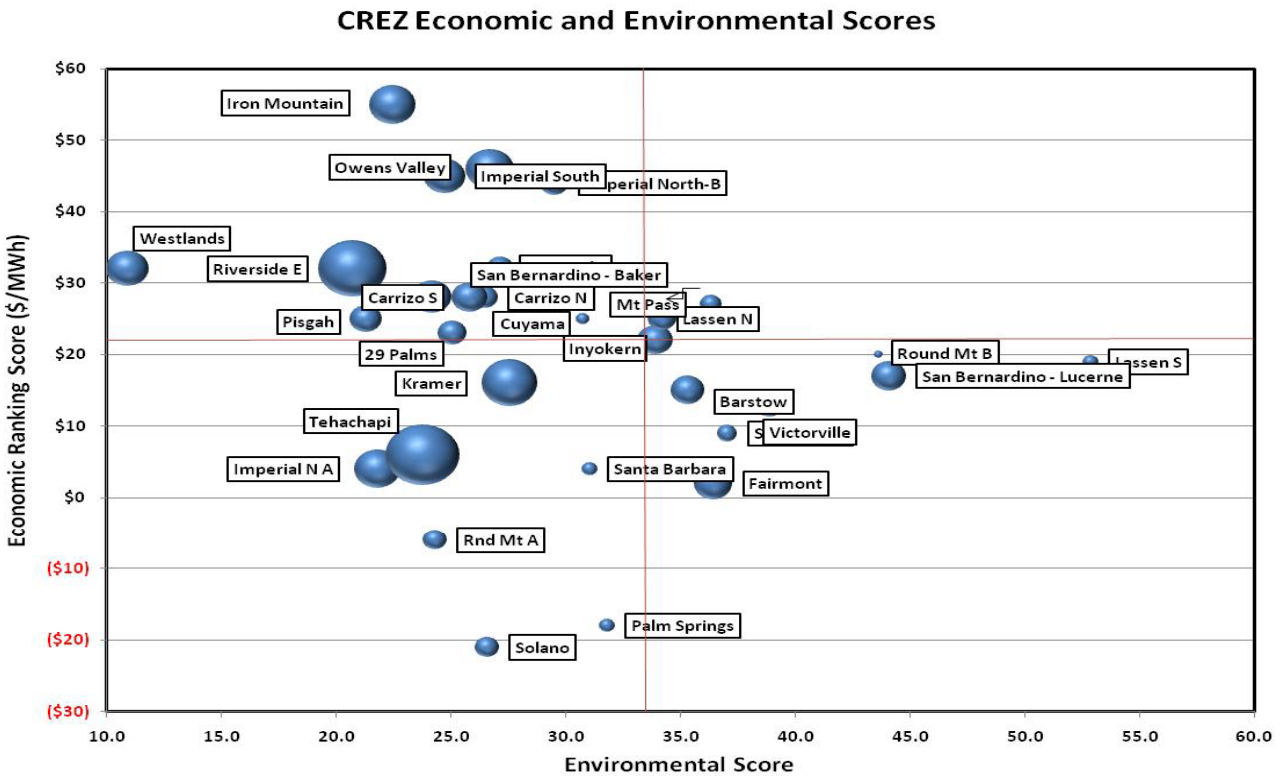
CREZ Re-ranking with Weight by Technology: Geothermal



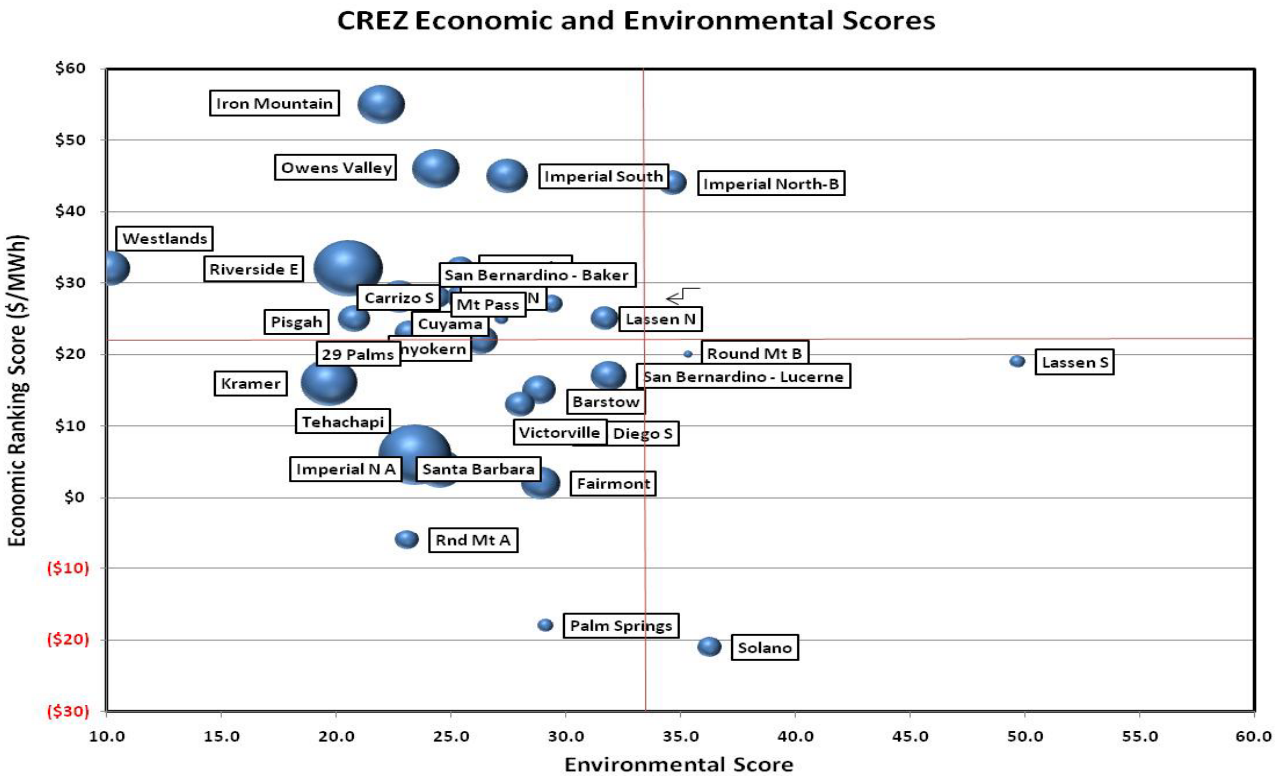
CREZ Re-ranking with Weight by Technology: Solar PV



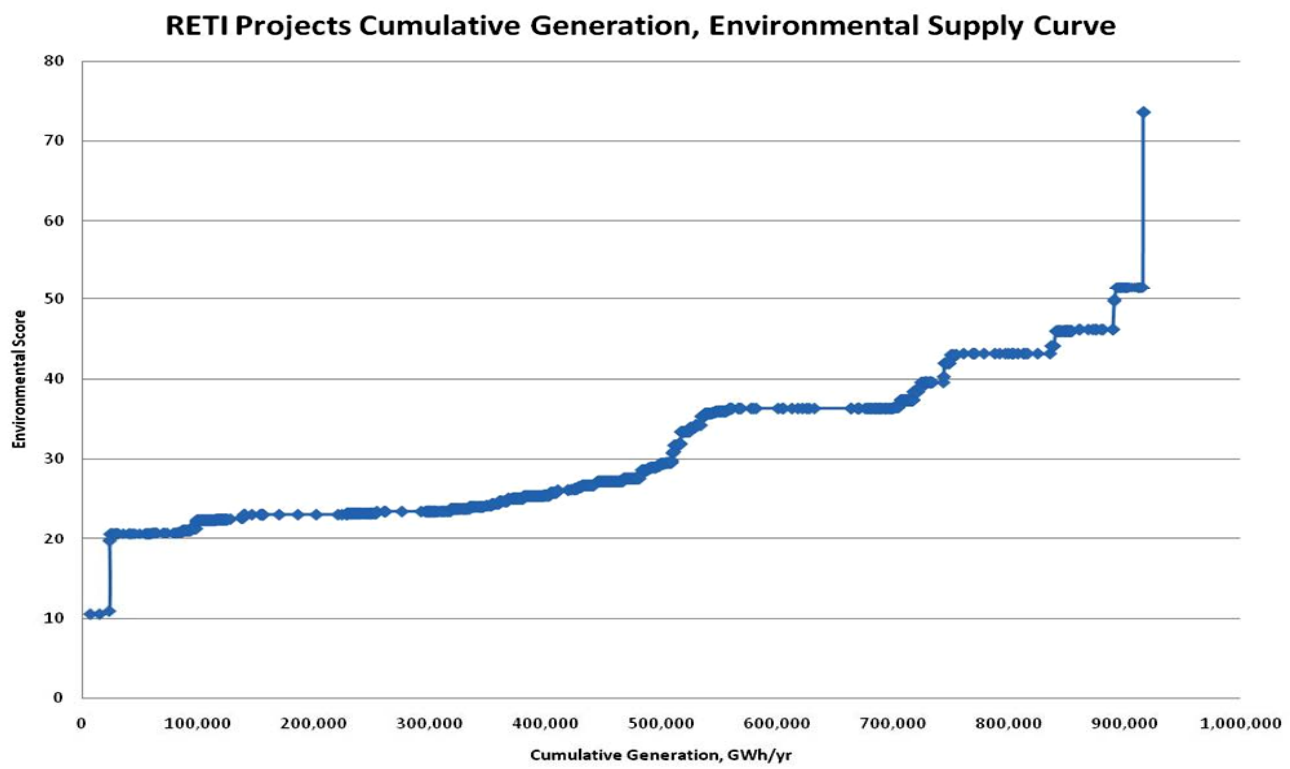
CREZ Re-ranking with Weight by Technology: Solar Thermal



CREZ Re-ranking with Weight by Technology: Wind



Environmental Scoring Results for RETI Projects, Cumulative Annual Energy



Environmental Scoring Results, Certain CREZs

Environmental Scores for Certain CREZs by Technology

CREZ	Biomass	Geothermal	Solar Photovoltaic	Solar Thermal	Wind
Arizona	36.16	27.84	23.07	23.46	22.65
Baja	45.68	41.57	51.71	56.19	51.51
Fairmont	30.94	30.05	35.69	36.45	28.95
Imperial North-A	35.94	26.14	21.37	21.81	24.54
Imperial North-B	49.89	34.83	28.63	29.52	34.68
Mountain Pass	40.33	33.48	35.80	36.35	29.40
Nevada	36.85	37.36	43.15	46.15	41.94
Oregon	45.94	39.56	36.88	37.58	36.31
Pisgah	37.46	27.24	21.09	21.33	20.81
Riverside East	28.88	23.79	20.64	20.73	20.55
Solano	34.58	24.95	25.03	26.59	36.29
Tehachapi	29.78	25.60	23.22	23.79	23.46
Westlands	26.37	16.65	10.53	10.91	10.14

Shaded > 1,000 GWh in ARB 33 % high load, Proposed RES, Draft Environmental Assessment, June 2010.

Discussion / Questions & Answers

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