



RETI Phase 2 Update Workgroup

Status Update to SSC

Black & Veatch: Ryan Pletka

February 26, 2010

Changes Since the Last SSC Meeting

- Made additional CREZ refinements
- Adjusted out-of-state transmission financing assumptions
- Verified Mexican / Canadian Incentive Treatment
- Added in-state California resources
- Included in-state transmission adder
- Included transmission losses
- Have updated base capacity value to \$153/kW-yr
 - RETI Phase 1B used \$204, sensitivity of \$102
 - WREZ used about \$150/kW-yr
- Responded to various stakeholder comments
- Have re-ranked the CREZs

CREZ Refinements

Capacity Changes Relative to Phase 2A (July 20, 2009)

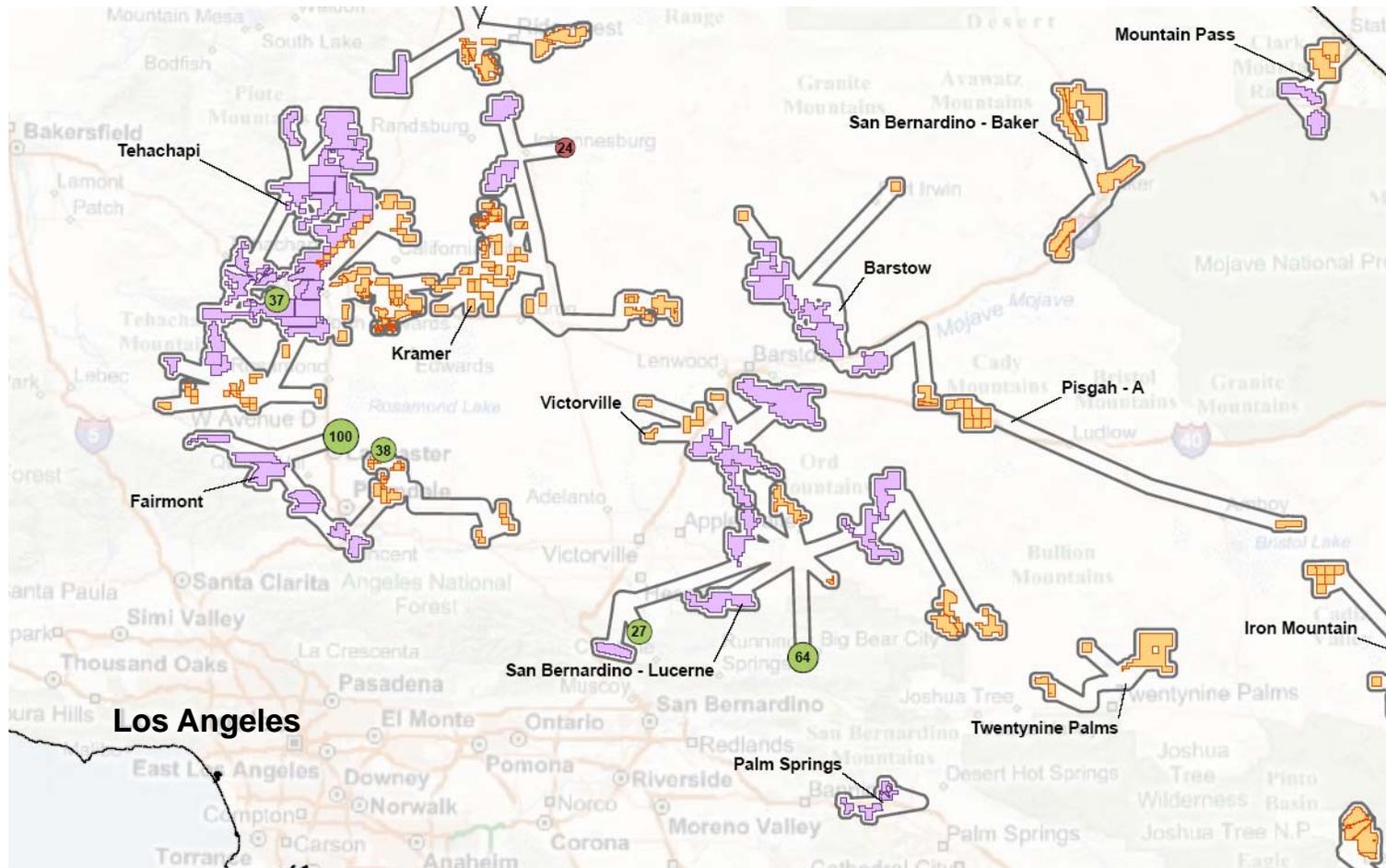
	Capacity (MW)				Capacity Total	Notes
	Biomass	Geothmal	Solar	Wind		
Barstow	-	-	-	-	-	No changes
Carrizo North	-	-	-	-	-	No changes
Carrizo South	-	-	(877)	-	(877)	Revised solar to 1B values, which were correct.
Cuyama	-	-	(400)	-	(400)	Revised solar to 1B values, which were correct.
Fairmont	-	-	(200)	(668)	(868)	Cut wind projects due to CREZ refinement. Solar project due th CA DPA
Imperial East	-	-	-	-	0	No changes
Imperial North-A	-	-	-	-	-	No changes
Imperial North-B	-	-	-	-	-	No changes
Imperial South	-	-	-	-	-	No changes
Inyokern	-	-	-	-	-	No changes
Iron Mountain	-	-	(50)	-	(50)	Small discrepancy due to Trilobite capacity assumption (moved in Phase 2A)
Kramer	-	-	-	-	-	No changes
Lassen North	-	-	-	-	-	No changes
Lassen South	-	-	-	-	-	No changes
Mountain Pass	-	-	-	(700)	(700)	Cut wind projects due the CA DPA
Owens Valley	-	-	3,600	-	3,600	Added 3600 MW of solar
Palm Springs	-	-	-	(437)	(437)	Cut wind projects due to CREZ refinement.
Pisgah-A	-	-	(350)	-	(350)	Cut half of Trilobite project due the CA DPA
Riverside East	-	-	-	-	-	No changes
Round Mountain-A	-	-	-	-	-	No changes
Round Mountain-B	(55)	-	-	(0)	(55)	Biomass project dropped since resource already in use in Shasta County
San Bernardino - Baker	-	-	(320)	-	(320)	Cut solar projects due to CA DPA
San Bernardino - Lucern	-	-	(800)	-	(800)	Cut solar projects due to CA DPA
San Diego North Central	-	-	-	-	-	No changes
San Diego South	-	-	-	-	-	No changes
Santa Barbara	-	-	-	-	-	No changes
Solano	-	-	-	-	-	No changes
Tehachapi	-	-	-	(412)	(412)	Cut wind projects due to CREZ refinement.
Twentynine Palms	-	-	-	-	-	No changes
Victorville	-	-	-	-	-	No changes
Westlands	-	-	5,000	-	5,000	Added 5000 MW of solar
Total	(55)	-	5,603	(2,217)	3,332	

Note: also completely cut the Needles CREZ due to the CA DPA (261 MW wind). This left one solar project at 200 MW, below the minimum CREZ size (250 MW)

Final Proposed California CREZ Capacity

CREZ_NAME	Sum of Capacity, MW				Total Sum of Capacity, MW
	Biomass	Geothermal	Solar Thermal	Wind	
Barstow			1,400	936	2,336
Carrizo North			1,600		1,600
Carrizo South			3,000		3,000
Cuyama			400		400
Fairmont	138		1,800	712	2,650
Imperial East			1,500	123	1,623
Imperial North-A		1,370			1,370
Imperial North-B	30		1,800		1,830
Imperial South	36	64	3,570	45	3,715
Inyokern			2,145	287	2,432
Iron Mountain			4,800	62	4,862
Kramer		24	6,185	203	6,412
Lassen North				1,467	1,467
Lassen South				410	410
Mountain Pass			780	178	958
Owens Valley			5,000		5,000
Palm Springs				333	333
Pisgah			2,200		2,200
Riverside East			10,550		10,550
Round Mountain-A		384			384
Round Mountain-B				132	132
San Bernardino - Baker			3,350		3,350
San Bernardino - Lucerne	91		1,540	599	2,230
San Diego North Central				281	281
San Diego South				678	678
Santa Barbara				433	433
Solano				894	894
Tehachapi	37		7,195	3,193	10,425
Twentynine Palms			1,805		1,805
Victorville			1,200	436	1,636
Westlands			5,000		5,000
Grand Total	332	1,842	66,820	11,403	80,396

New CREZ Map

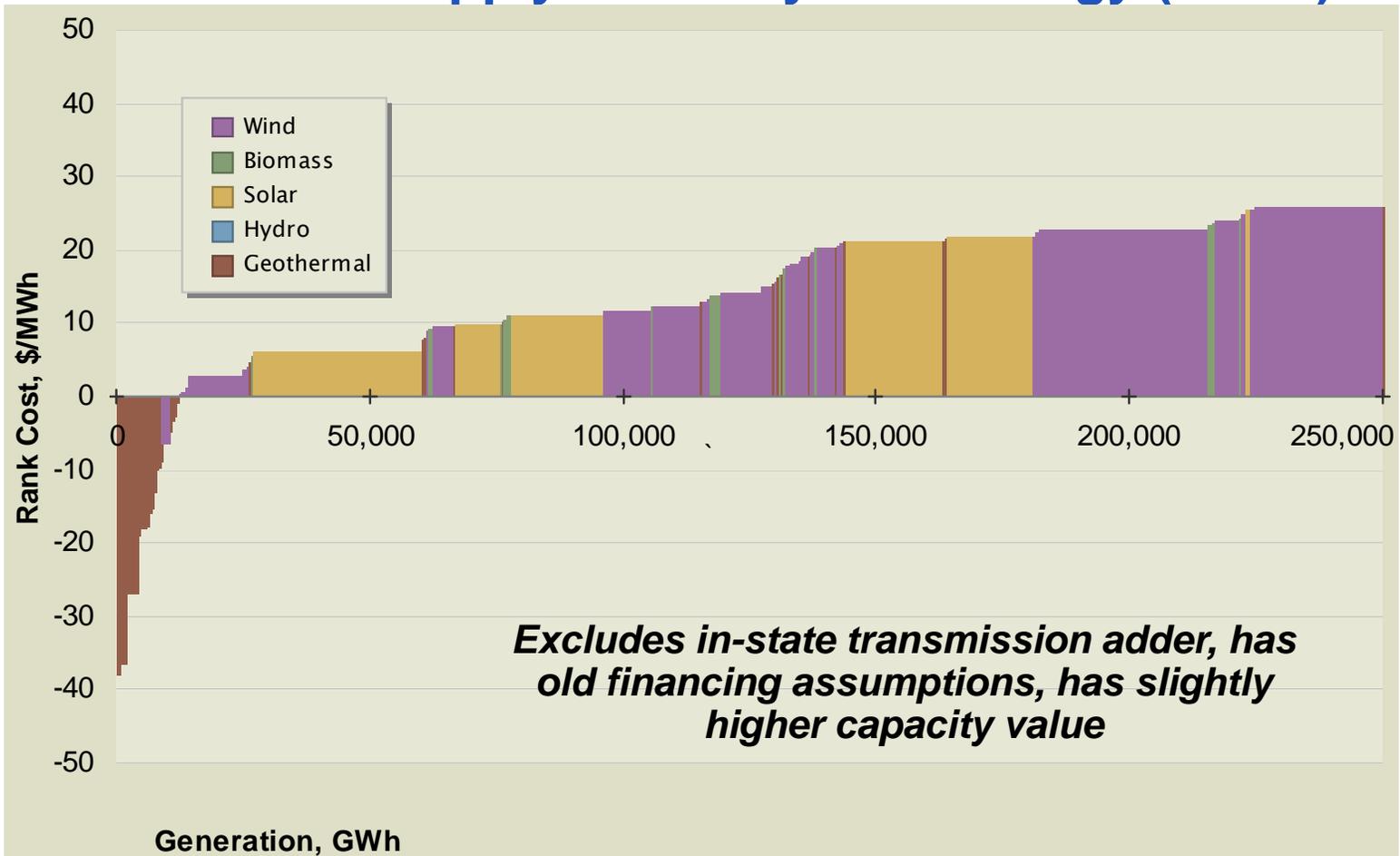


CREZ Economics

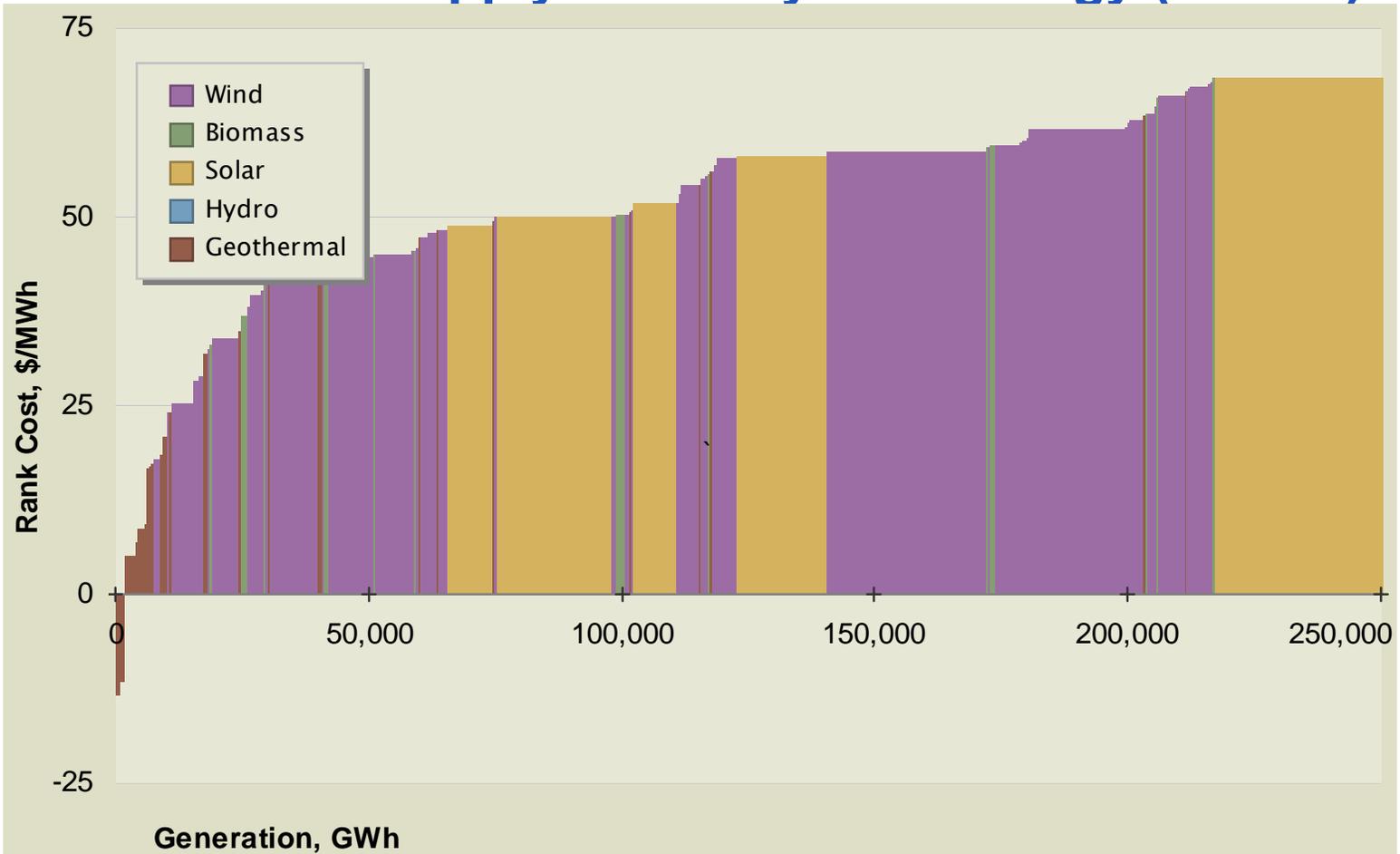
Out-of-state Transmission Financing Assumptions

	Federal	IOU (UREZ)	Blended	Current
Economic Life	40	20	40	40
Debt Percentage	100%	60%	60%	50%
Debt Term	30	20	30	30
Interest Rate	5.0%	7.0%	6.0%	6%
Equity Cost	—	11.0%	11.0%	13%
Tax Life	—	15	15	15
Discount Rate	5.0%	8.6%	7.5%	7.625%
Tax Rate	—	38%	38%	40%
Non-Capital Costs	3%	3%	3%	3%

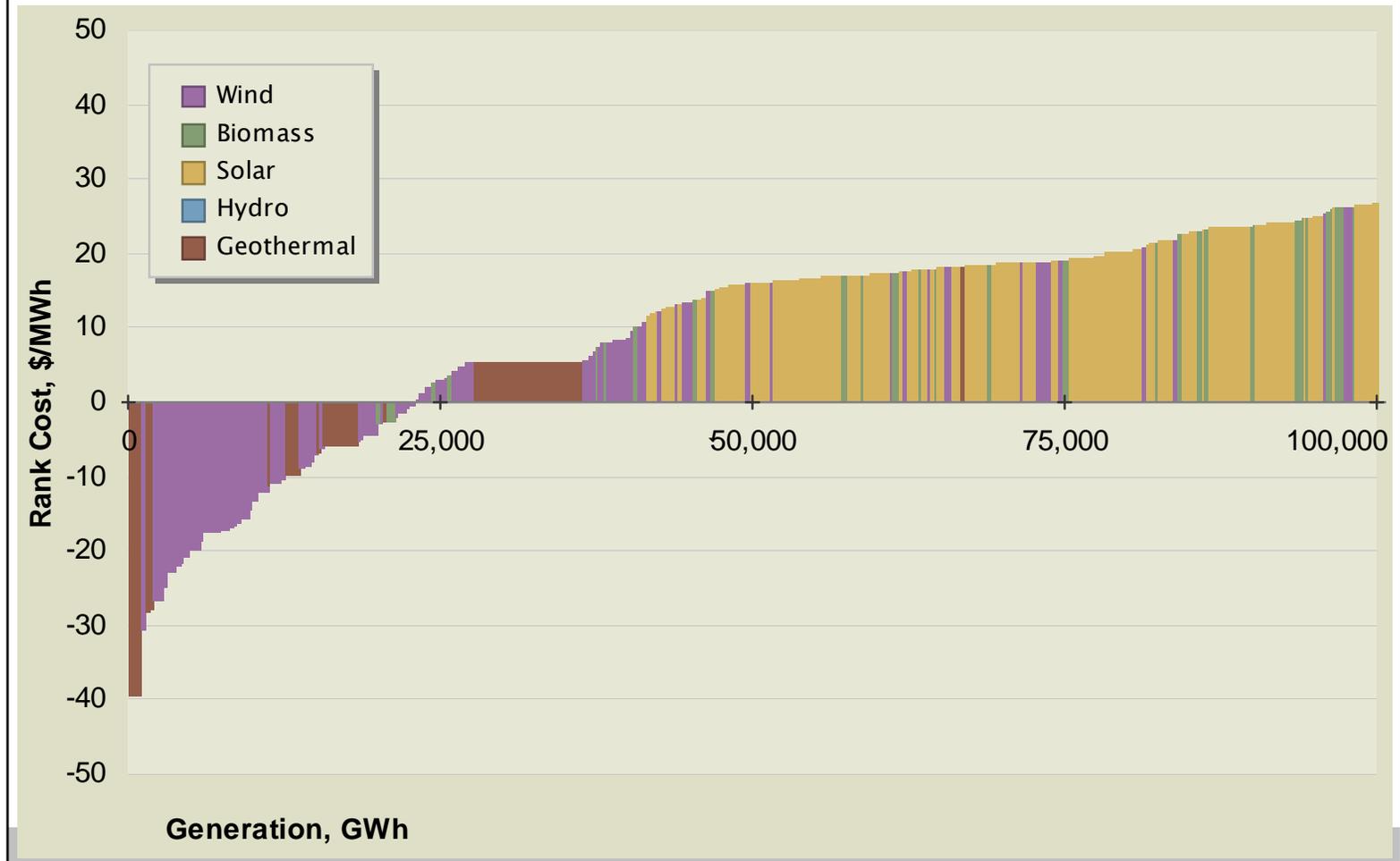
Out-of-State Supply Curve by Technology (Feb 4)



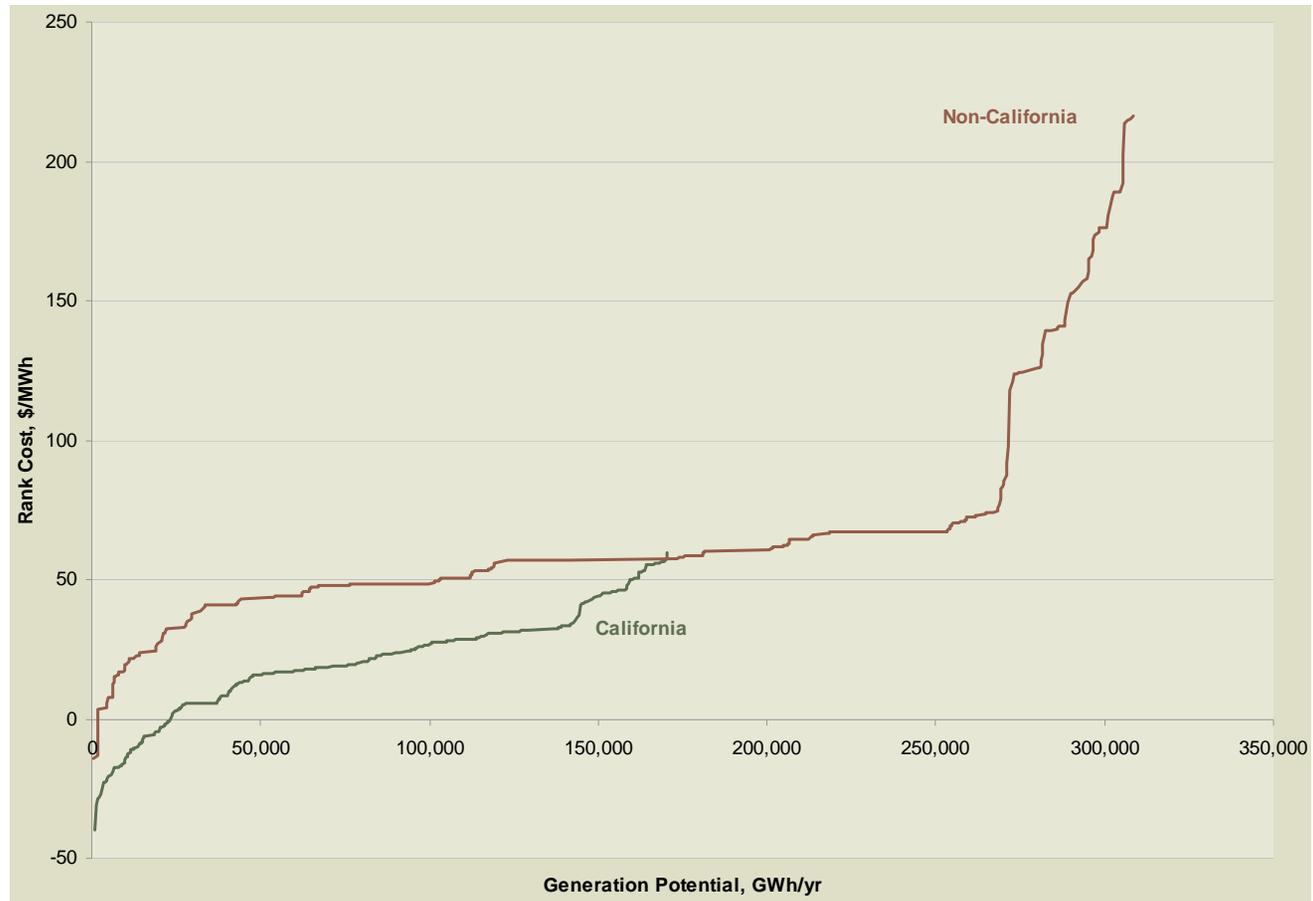
Out-of-State Supply Curve by Technology (Feb 18)



In-State – Supply Curve of Best Resources



In-state versus Out-of-state

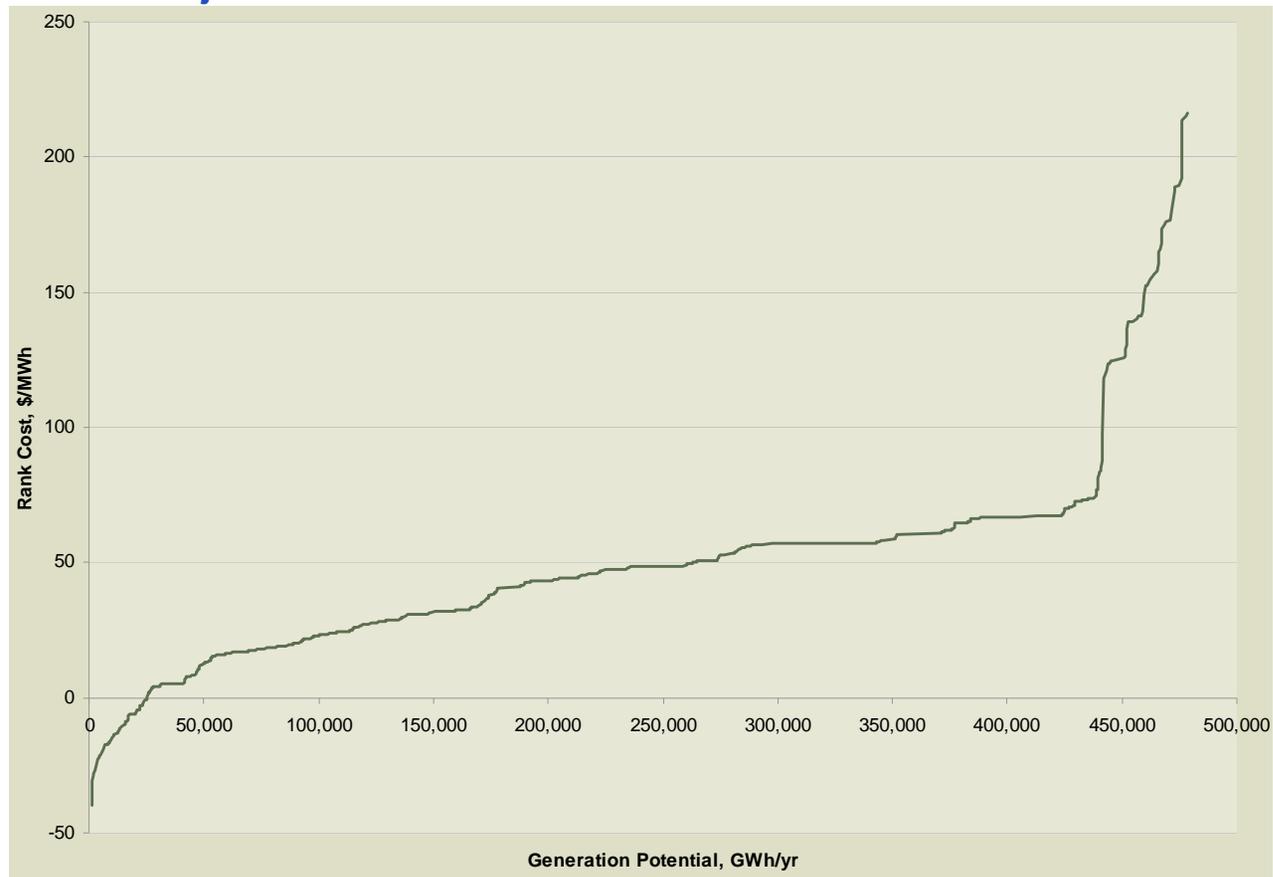


Special Considerations for Out-of-State Projects

- Out-of-State projects and transmission based on default assumptions
- Opportunities for specific projects to deliver at lower cost:
 - Utilize existing transmission
 - Better financing
 - Shaping and firming resources
 - More cost effective transmission (e.g., HVDC)

RETI Phase 2A Update Overall Supply Curve

Individual Project Basis



RETI Phase 2A Update Overall Supply Curve

Individual Project Basis



Ranked California CREZs (by Rank Cost, \$/MWh)

CREZ	2A Update
Solano	-21
Palm Springs	-18
Round Mountain-A	-6
Fairmont	2
Imperial North-A	4
Santa Barbara	4
Tehachapi	6
San Diego South	9
Victorville	13
San Diego North Central	14
Barstow	15
Kramer	16
San Bernardino - Lucerne	17
Lassen South	19
Round Mountain-B	20
Inyokern	22
Twentynine Palms	23
Pisgah	25
Cuyama	25
Lassen North	25
Mountain Pass	27
Carrizo South	28
Carrizo North	28
San Bernardino - Baker	28
Riverside East	32
Westlands	32
Imperial East	32
Imperial North-B	44
Imperial South	45
Owens Valley	46
Iron Mountain	55

Ranked Out-of-State CREZs (by Rank Cost, \$/MWh)

CREZ	RC \$/MWh
UT_WE	20
OR_SO	25
OR_WE	29
NV_NO	29
OR_NE	35
NV_SW	40
AZ_NE	44
ID_SW	45
WY_EC	45
AZ_WE	48
AZ_NW	49
WA_SO	51
ID_EA	54
NV_WE	55
WY_SO	57
NM_EA	57
BJ_NO	57
WY_NO	58
WY_EA	62
NM_SE	65
NV_EA	66
AZ_SO	67
BJ_SO	75
BC_WC	94
BC_EA	130
BC_SE	139
BC_WE	142
BC_NE	148
BC_SW	154
BC_SO	157
BC_NO	161
BC_CT	175
BC_NW	184

To Complete

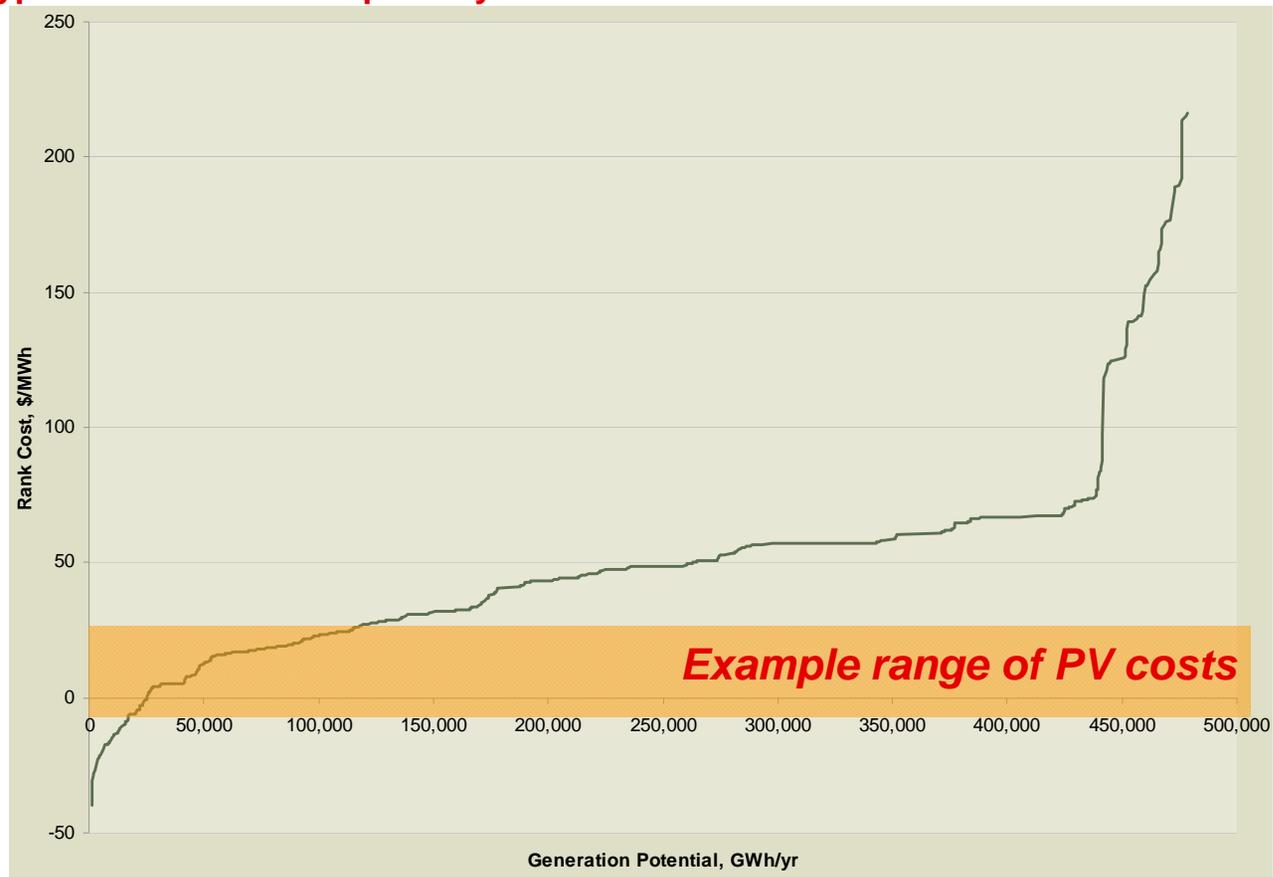
- Perform sensitivity and uncertainty analysis
 - Uncertainty Analysis - Same approach as RETI Phase 1
 - Sensitivity: BC Shaped Product
 - Sensitivity: Advanced Solar Technologies
 - Sensitivity: Distributed Solar PV
 - Sensitivity: No OOS transmission costs
- Report

Consideration of Distributed Solar PV

- Can estimate economics
- Difficult to estimate quantity

Example of Distributed Solar PV Sensitivity

Hypothetical – for example only



Thank You!

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