



Proposed Portfolios for the 2012-13 Transmission Planning Process

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April 2, 2012





Outline

- Context for Portfolios
- Reminder: Basics of 33% RPS Calculator
- Major updates
- Proposed portfolios
- Announcing workshop at CPUC, 4/11-12





CONTEXT FOR PORTFOLIOS





Transmission permitting at the CPUC

- For IOU-proposed transmission facilities, IOU must receive permit from CPUC:
 - for transmission line facilities 50-200 kV and/or substations 50 to 500 kV, a **Permit to Construct (PTC)**;
 - for transmission line facilities 200 kV and up, a **Certificate of Public Convenience and Necessity (CPCN)**
- Permitting process considers three major questions:
 - Need for the project (CPCN only) – Pub. Util. Code requires consideration of alternatives, including demand-side alternatives
 - Environmental impact – CEQA also requires alternatives analysis
 - Reasonable cost





Long-term procurement oversight at the CPUC

- CPUC's biennial long-term procurement plan (LTPP) proceeding authorizes IOU procurement of new resources
 - 33% RPS impacts the amount, type, and location of resources needed
 - Also considers load, fossil additions/retirements, local needs, etc
- 2010 LTPP (R.10-05-006), Track 1 "system":
 - "to identify CPUC-jurisdictional needs for new resources to meet system or local resource adequacy need over the 2011-2020 planning horizon, including issues related to long-term renewables planning"
 - Proposed Decision on agenda for April 19, 2012 PUC meeting
- 2012 LTPP (R.12-03-014)





RPS planning assumptions in the LTPP

- In consultation with parties, CPUC staff develops planning scenarios, including possible 33% RPS portfolios
- LTPP will not direct RPS procurement, but implications of LTPP and TPP results may be considered in the CPUC's RPS proceedings
 - Increasingly important given:
 - TPP-GIP (define)
 - and DG Deliverability





Importance of coordinated planning

- “Umbrella” LTPP proceeding considers forecasted levels of energy efficiency, demand response, distributed generation, utility-scale renewables, and resource retirements, to determine overall procurement need
 - CPUC must consider many of these same resource alternatives when evaluating the need for a transmission line in the CPCN process
- Using common renewable portfolios across generation and transmission planning processes could allow for a smoother and more coordinated CPUC “need determination” in permitting process
- Coordinating and aligning assumptions should also reduce the risk of successful legal challenges to CPUC need determination





Coordinating generation and transmission planning

- CPUC and CAISO signed Memorandum of Understanding on May 13, 2010
 - Commits to closer coordination between resource planning and transmission planning
 - CPUC goal: ensure that the transmission planning process includes need analysis necessary for transmission permitting phase
- Environmental and permitting data is also critical to generation development and planning . . .



Orderly Development of Renewable Energy

- ▶ California has determined that we need to plan for the orderly development of our world-class renewable resources while minimizing the need for new transmission infrastructure and the associated environmental impacts.
- ▶ The Desert Renewable Energy Conservation Plan (DRECP) is providing that direction.
- ▶ The DRECP is being developed by the Renewable Energy Action Team (REAT) comprised of the California Energy Commission, the California Department of Fish and Game, the U.S. Bureau of Land Management (BLM), and the U.S. Fish and Wildlife Service with the cooperation of the California Public Utilities Commission, the California State Lands Commission, the California Independent System Operator, and the Department of Defense.

Desert Renewable Energy Conservation Plan

- ▶ The DRECP is intended to balance renewable energy development with natural resource conservation by identifying areas for renewable development and areas for conservation, species management and enhancement.
- ▶ The DRECP is working with a large and diverse stakeholder advisory group, and it is coordinating with existing desert Conservation Plans within the Mojave and Colorado Deserts, the BLM Solar Programmatic Environmental Impact Statement (PEIS), and transmission planning efforts in order to develop an integrated framework for balancing natural resource conservation and renewable energy development.

DRECP Needs to be Integrated into LTPP

- ▶ Renewable generation areas and potential transmission corridors needed to access them are being identified in the DRECP to facilitate future generation and transmission siting and permitting so that renewable generation and transmission development occurs expeditiously in preferred areas identified by federal, state and local agencies.
- ▶ The CEC and CPUC now believe that the land use assumptions and natural resource data being developed in the state/federal/stakeholder DRECP process should be integrated into the LTPP process.



Basics of 33% RPS Calculator

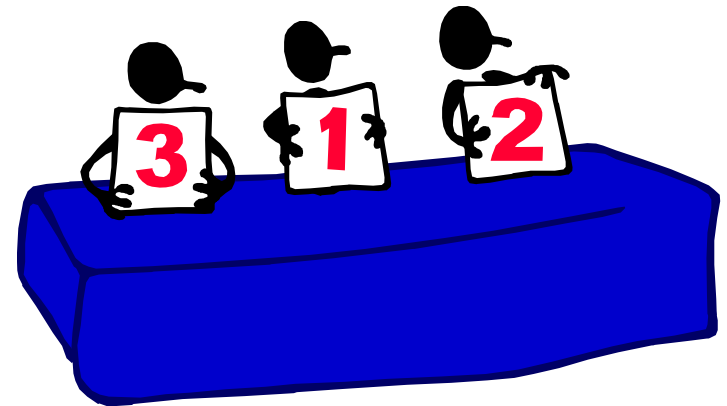
Originally developed by Energy + Environmental Economics (E3) for Energy Division.





Project Scoring Methodology

- Each project is scored on a 0-100 scale based on four metrics (0 is best):
 - Net Cost Score (unchanged)
 - Environmental Score (revised)
 - Commercial Interest Score (revised)
 - Permitting Score (new)
- Final score used to rank a project for any one scenario is a weighted average of the four individual metrics





Resource Selection Methodology

1. Calculate project score and rank each resource
2. Allocate lowest cost out-of-state theoretical projects to host states until all non-CA WECC RPS targets for 2022 are satisfied
3. Rank remaining CREZ projects and select to fill transmission bundles
4. Calculate aggregate score for each transmission bundle
5. Rank transmission bundles against individual non-CREZ and REC-only resources
6. Select resources and bundles to meet 33% RPS target in 2022





Selection of RPS Portfolio

- Each transmission bundle is assigned an aggregate score based on an average of the constituent resources and compared against individual non-CREZ and RECs resources
- Discounted Core* Projects are selected first (i.e. forced in) unless in New Transmission bundle
- After Discounted Core, resources & bundles with the lowest score are selected to fill the 2020 RPS net short



*Projects that are sufficiently advanced to be considered “sunk” decisions.





Clarification: Discounted Core

- Discounted Core projects are “forced in” if:
 - They do not require new transmission, or
 - 67% of energy delivered on new transmission is from discounted core projects
 - NOT a 67% capacity factor requirement
 - Actual capacity factor varies by bundle make-up
- Failing this, discounted core projects must compete on weighted scores





MAJOR UPDATES





Major Updates

- New Net Short
- Revised Capital Costs
- Fairmont CREZ added to Tehachapi
- New Project Lists
 - New Discounted Core (#6)
 - New Definition of Commercial Interest
 - New Small Solar PV (“DG”) projects
 - Added REAT projects
- Environment and Permit Scores



Renewable Net Short (GWh)

Row	Demand Forecast	Source	Value, 2022
1	Total Retail Sales	February 23, 2012 Revised Mid Forecast 1.1c	299,379
2	Pumping Load	ibid	12,530
3	Incremental Uncommitted EE	Aug 2011 Mid Incremental Uncommitted EE (zero for BBEES)	14,714
4	Incremental Rooftop PV	Proposed Method to Calculate the Amount of New Renewable Generation Required to Comply with Policy Goals, pg. 19	3,200
5	Incremental CHP	ibid, pg. 21	0
6	Total for retail sales for RPS	(Row 1 - row 2 - row 3 - row 4 - row 5)	268,935
7	Total Renewables Needed	33% * Row 6	88,748
8	Total In-state Renewable Generation	Proposed Method to Calculate the Amount of New Renewable Generation Required to Comply with Policy Goals, Table 5	34,300
9	Total Out-of-State Renewable Generation	ibid, Table 5	9,200
10	Total Existing RPS Generation	(Row 8 + Row 9)	43,500
11	Renewables Net Short	(Row 7 - Row 10)	45,248



Changes in Net Short (GWh)

Item	2010 LTPP (2020)	Current (2022)	% Change
Retail Sales	303,253	299,379	-1.3%
RPS-Qualifying Retail Sales	263,280	268,935	2%
RPS Target	86,882	88,749	2%
Existing Resources	32,613	43,500	33%
Net Short	54,269	45,248	-17%





Generation Capital Costs

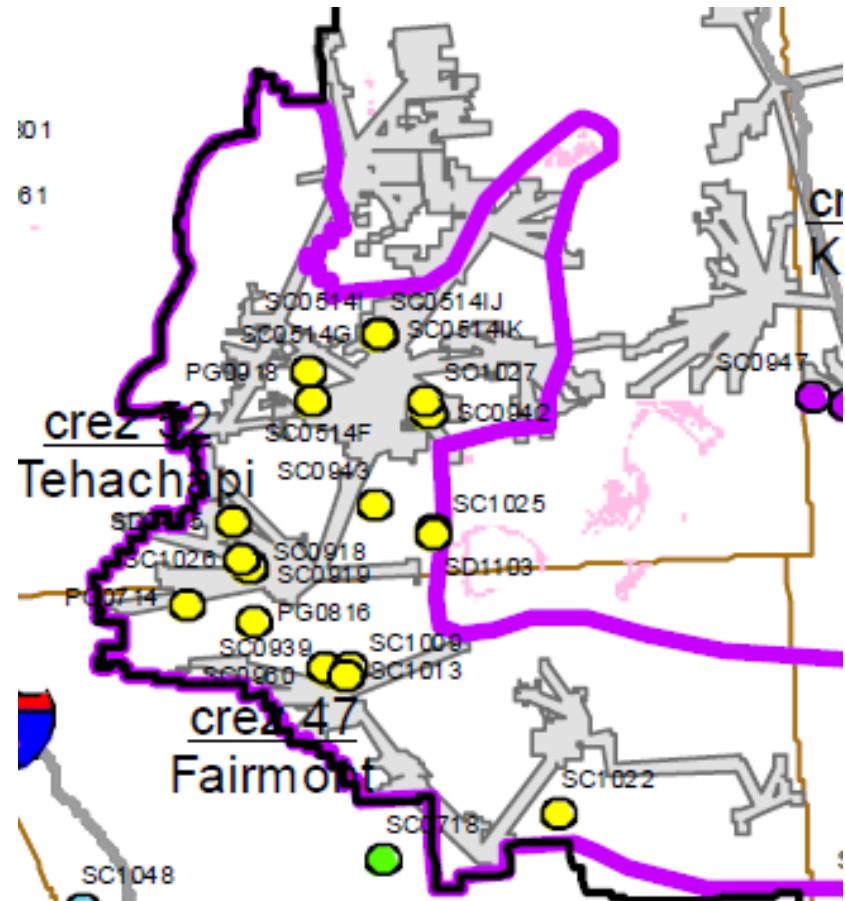
- Non-PV technologies unchanged
- All PV technologies down 30%
 - Approximately consistent with other estimates and procurement information





Fairmont and Tehachapi

- Physically, share transmission
- Fairmont resources listed as Tehachapi





Updating Project Lists

Data Source	Use	Description in Calculator	Changes
IOUs/PDSRs	IOU Commercial Interest Projects	“ED Database”	Updated
CEC/POUs	Muni Commercial Interest Projects	“CEC-POU-2012”	Updated
Renewable Energy Action Team	Projects in Permitting	“REAT”	New
E3 Local Distributed PV Study	Replace generic “DG” resources	“E3/LDPV”	New
Generics	Represent other potential	“RETI 1B”, “RETI 2A”, “WREZ”, “E3 GHG Calculator”	Mostly unchanged



New Discounted Core: 6

Core	Description	Relevant “Project Viability Calculator” Scores
1	New/re-powered projects with PPAs signed and approved/under review by CPUC, as of Feb. 2012 Project Development Status Reports (PDSRs)	
2	Core 1 projects with major permits (Conditional Use Permit/Application for Certification) also deemed data adequate, as of Feb. 2012 PDSRs	Permit Status ≥ 5
3	Core 1 projects with major permits also approved, as of Feb. 2012 PDSRs	Permit Status > 5
4	Core 1 projects with high scores also on Project Development Experience, Ownership/P&M Experience and Technical Feasibility per the Project Viability Calculator, as of Feb. 2012 PDSRs	Project Development Experience ≥ 7 ; Ownership/O&M Experience ≥ 7 ; Technical Feasibility ≥ 5
5	Core 2 projects with PPAs also approved by regulator as of Feb. 2012 PDSRs	
<u>6</u>	<u>Core 3 projects with PPAs also approved by regulator as of Feb. 2012 PDSRs</u>	



New Definition of “Commercial Interest”

- Executed PPA
- Complete application for major permit
- Projects that pass these screens have Commercial Interest Score of 0
 - All others, 100





New Small Solar PV Projects

- Replace previous generic Small Solar PV
- New E3 study*: “Local Distributed PV”
 - Optimized for “Least Net Cost”
 - No backflow
 - Hourly (8760) generation is always less than load, measured at substation
 - High cost case, i.e. no learning/decline in costs over time
 - Investment Tax Credit is extended

*<http://www.cpuc.ca.gov/NR/rdonlyres/8A822C08-A56C-4674-A5D2-099E48B41160/0/LDPVPotentialReportMarch2012.pdf>



Project Identification and Scoring Process

- ▶ The CPUC and CEC staffs worked collaboratively to identify the lists of renewable energy projects that needed to be evaluated as to their permitting status and also assigned an environmental sensitivity score for their location.
- ▶ Both the CPUC and CEC had databases of renewable projects that required review for accuracy, completeness and duplication.

Renewable Energy Project Databases

	List Name	Number of projects	Source or use of project list
1	CPUC Commercial Project List	162	Projects with utility-approved Power Purchase Agreements
2	Publicly Owned Utility List	16	CEC List of Publicly Owned Utility projects
3	Filtered REAT List	214	CPUC filtered list of REAT Projects which have complete permit applications and were not otherwise included
4	Distributed Generation (DG) Scoring List Revised	948	CPUC List developed by E3 Consultants
5	Generic Projects (RETI & Western Renewable Energy Zones (WREZ))	1026	Potential/Generic Projects
	Total Projects Scored	2366	

Permitting Status Scoring

Permitting Status Score	Permitting Status
0	Project has received its Conditional Use Permit (CUP), Application for Certification (AFC), Record of Decision (ROD) from the BLM or equivalent federal agency, or other definitive permit based on the project's jurisdiction, as applicable.
50	Project has applied for its CUP or AFC, or other definitive permit based on the project's jurisdiction, as applicable. The applicable permit or application has been deemed data adequate and/or the designated agency has initiated its review. No fatal flaws have been identified (e.g., protected species and/or land, high land mitigation requirement) that will prevent project development.
100	Project has not initiated permitting. No fatal flaws have been identified (e.g., protected species and/or land, high land mitigation requirement) that will prevent project development.

Environmental Scoring Methodology

- ▶ In order to incorporate DRECP and other updated environmental information into project scores, the scores were based on the location of the project in one of five categories.
- ▶ Scores are based on a combination of positive preferences for certain areas (in RESAs and/or on disturbed lands).
- ▶ Negative or high (worse) scores given for non-RESA but within DRECP boundary.
- ▶ Neutral scores assigned projects on non-desert, non-disturbed lands.
- ▶ Rooftop mounted DG Projects assigned best (lowest) scores regardless of location.

Environmental Scoring Matrix

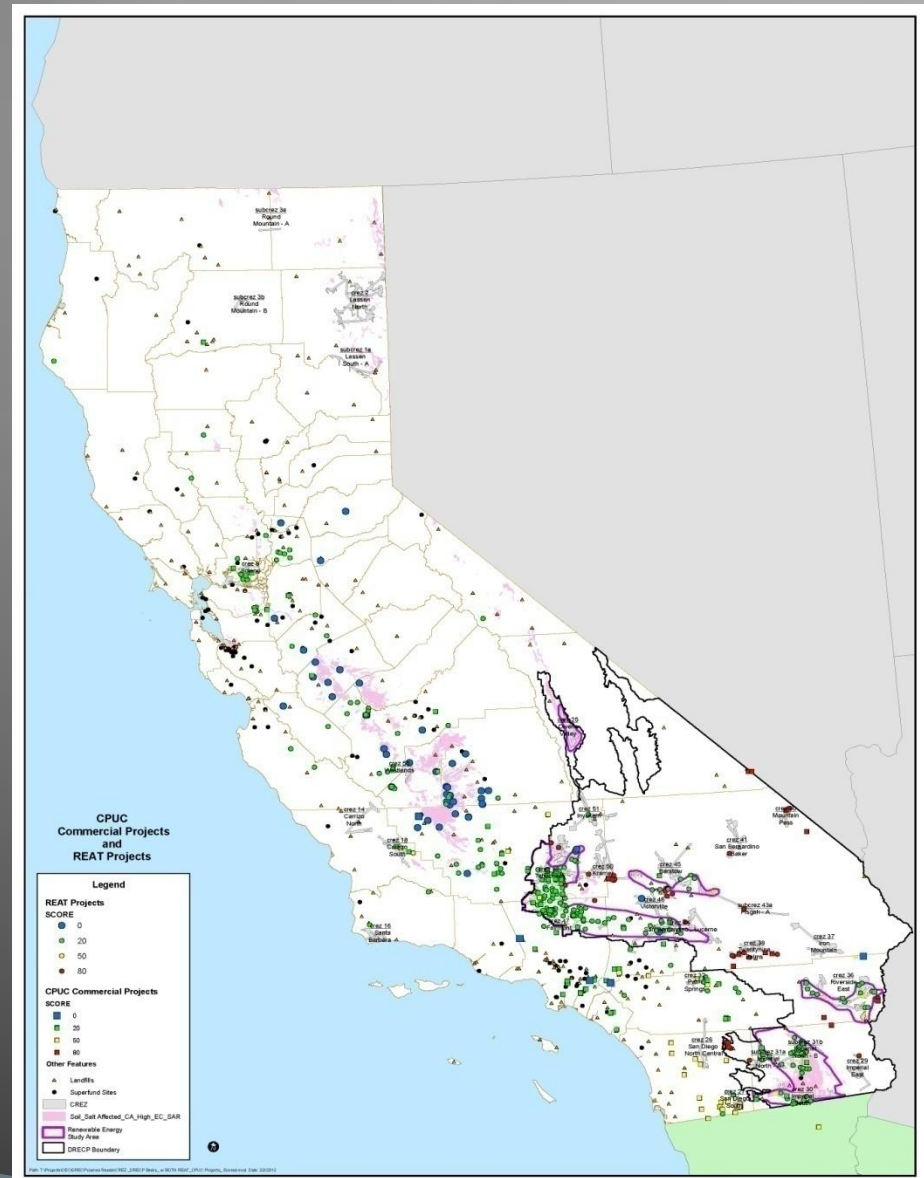
Category	DG?	Project Location			Score 0=best 100=worst	Location Examples
		In DRECP?	Disturbed Lands?	In a RESA?		
1	N	Y	N	Y	25	All ground-mounted projects in a RESA and not described by any other categories
2	N	Y	N	N	80	All ground-mounted projects outside a RESA and not described by any other category
3	N	N	N	N/A	50	All projects outside the DRECP, projects on productive agricultural lands, including ground-mounted PV outside the DRECP, any project unable to score individually; all non-California projects
4	N	N/A	Y	N/A	20	Ground-mounted PV on abandoned agriculture, closed facilities (e.g., abandoned military bases, closed mines), degraded/disturbed lands
5	Y	N/A	N/A	N/A	0	Roof-top solar PV, solar PV projects located as shade structures in parking lots, ground-mounted PV at waste water treatment plants, remote DG on brownfields, remediated sites, at existing substations/electric facilities, at landfills and industrial plants.

Environmental Scoring Process

- All projects needed to have their unique CPUC ID numbers linked to a latitude and longitude before they could be mapped by the CEC Cartography Unit.
- Latitude and Longitude data was then input by CEC Cartography Unit to produce maps for each of the databases to be scored.

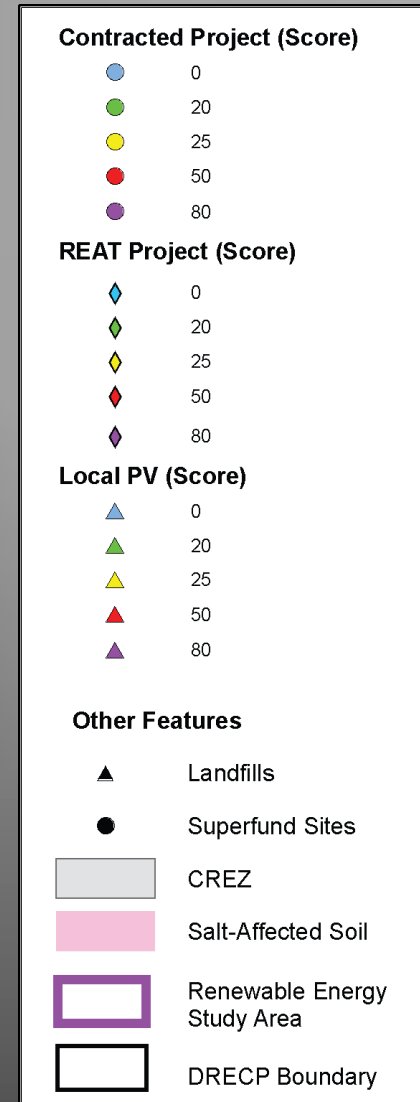
Environmental Scoring Process

- Once the maps were produced using a unique identifier for each of the 2,366 data points, scoring could commence.

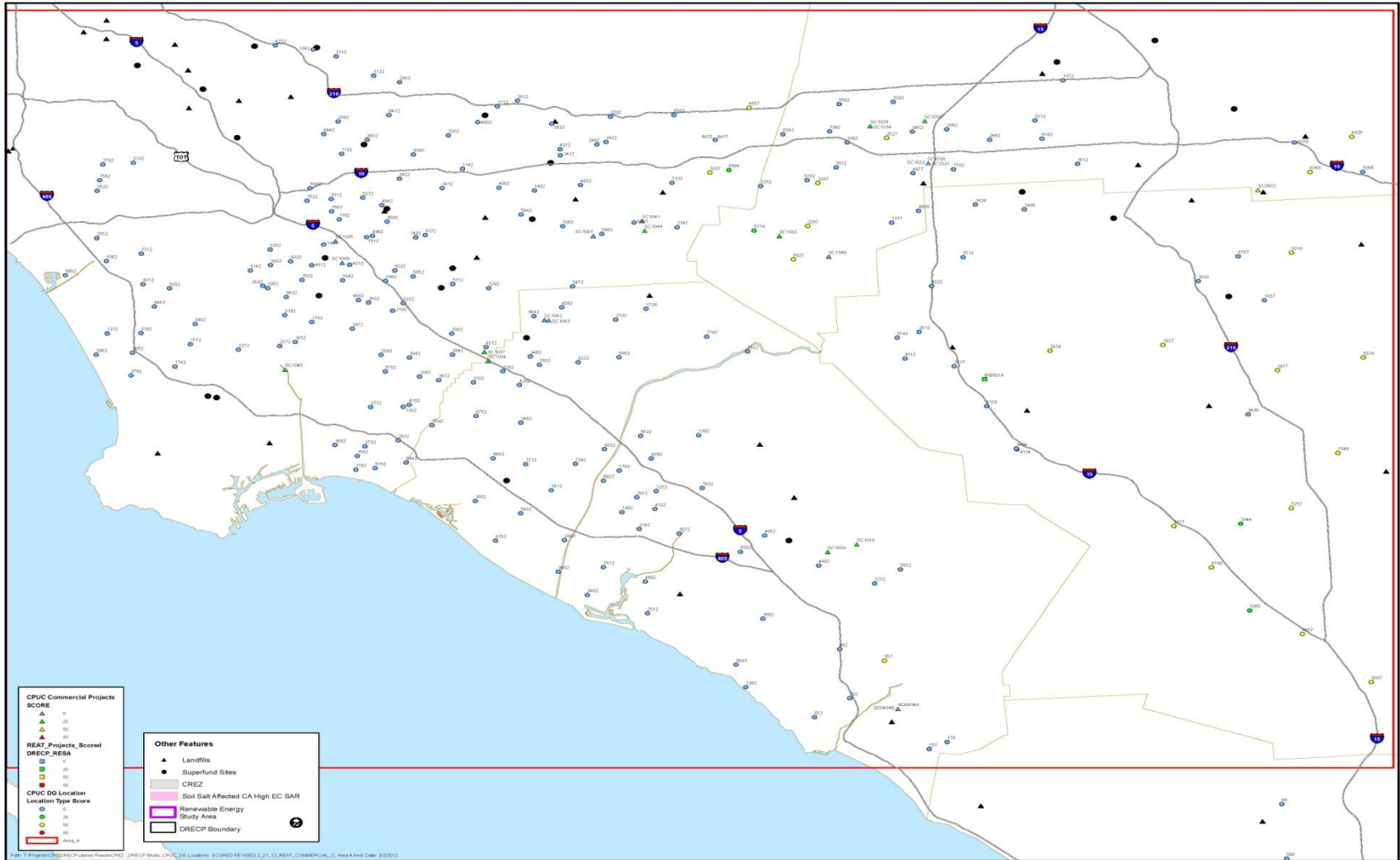


Environmental Scoring Process

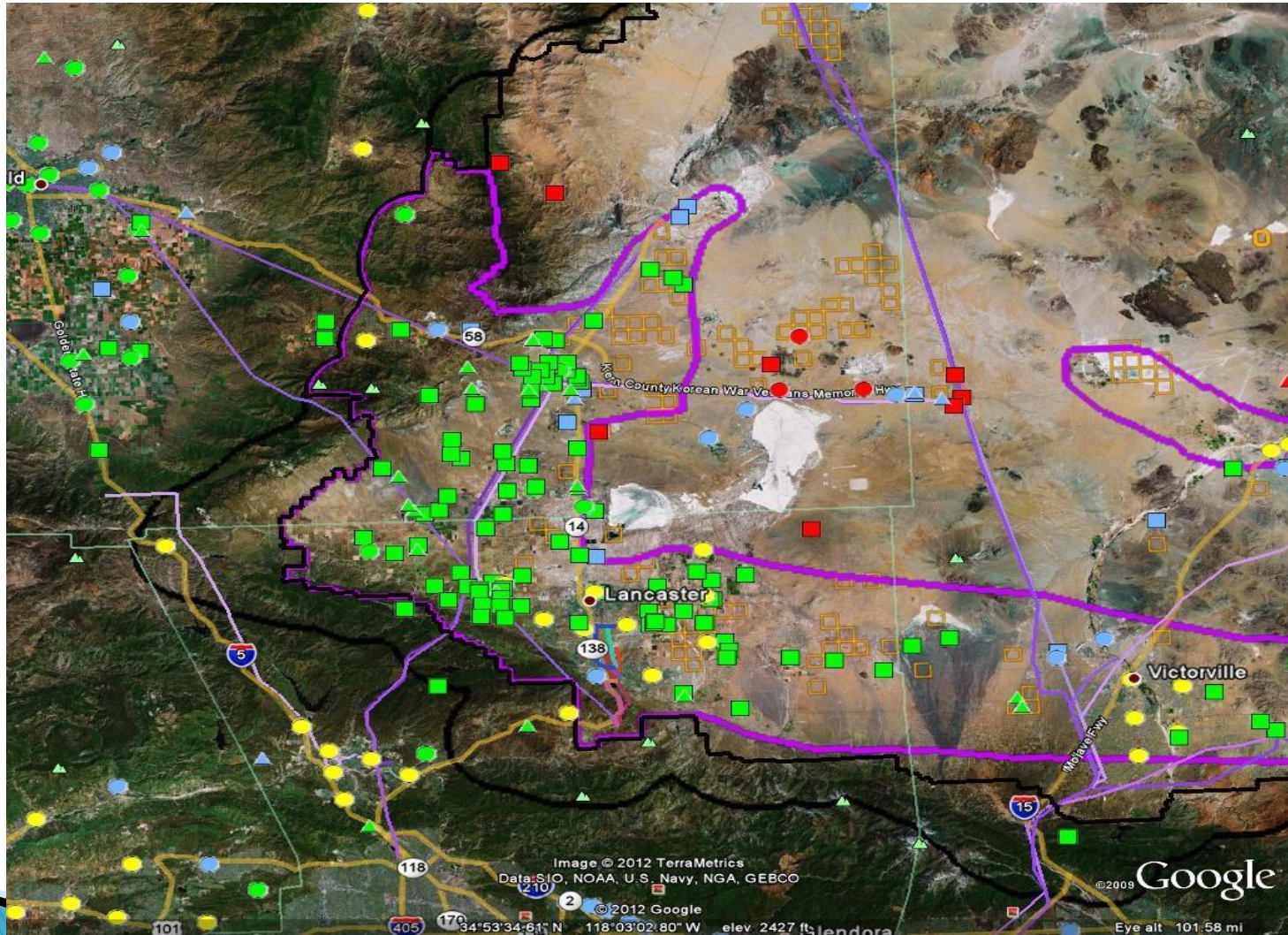
- Overlays for DRECP, RESA, CREZ, landfills, Superfund sites, and Salt-contaminated soils were added.
- Color-coded legends to identify each project's scoring were included.



Each data point on the map was scored using the Environmental Scoring Matrix (West LA Basin shown)



Some scoring required the use of Google Earth to determine on-ground conditions



Quality Control of Data

- ▶ Project lists were inspected for complete data; missing data was obtained.
- ▶ Duplicate records were eliminated.
- ▶ Output maps were visually inspected for environmental scoring anomalies (color codes).



What Was NOT Updated

- Cosmetics
- Secondary outputs (e.g. Cost Impacts tab)
- Inputs/assumptions that were:
 - Not significantly changed
 - Not important to results
 - Alternate cases for many inputs (e.g. load, RPS targets)
- *Users wishing to develop other scenarios or look at secondary outputs should carefully understand details*





PROPOSED PORTFOLIOS





CPUC/CEC Propose 4 Portfolios

- Cost – Proposed as base case
 - Minimizes cost of RPS generation + transmission
- Environment
 - Selects for environmentally preferred generation locations
- Commercial Interest
 - Preference to projects with PPAs + permit applications
- High DG
 - Includes extra small solar PV near load



Portfolio Summary

Scenario Name	Cost	Environment	Commercial Interest	High DG*
Net Short (GWh in 2022)	45,248	45,248	45,248	45,248
Discounted Core	6	6	6	6
Weight on Cost Score	0.7	0.1	0.1	0.7
Weight on Environmental Score	0.1	0.7	0.1	0.1
Weight on Commercial Interest Score	0.1	0.1	0.7	0.1
Weight on Permitting Score	0.1	0.1	0.1	0.1
	Portfolio Totals (MW)			
Discounted Core	7,115	7,255	7,501	12,421
Commercial Non-Core	2,324	2,270	4,027	2,264
Generic	7,444	7,886	5,563	3,263
Total	16,883	17,411	17,091	17,948
Biogas	138	154	136	138
Biomass	119	281	119	119
Geothermal	922	535	607	833
Hydro	-	21	-	-
Large Scale Solar PV	9,771	6,235	6,903	6,399
Small Solar PV	2,266	4,916	2,537	7,572
Solar Thermal	827	827	1,899	827
Wind	2,840	4,442	4,890	2,060
New Transmission Segments			Kramer - 1**	41

Estimate of NonCREZ by County (MW)

County	High DG	Environment	Commercial Interest	Cost
Alameda	7	7	7	7
Contra Costa	78	78	78	78
Fresno	100	108	100	100
Glacier	105	105	105	105
Imperial	610	610	610	610
Inyo	0	0	400	0
Kern	818	1,841	1,754	1,183
Kings	60	80	80	60
Los Angeles	52	92	59	354
Merced	110	370	110	110
Monterey	0	3	3	3
Orange	99	105	99	99
Riverside	101	143	43	2,223
Sacramento	55	100	55	55
San Benito	399	399	399	399
San Bernardino	270	34	23	764
San Diego	17	201	201	201
San Francisco	18	18	18	18
San Joaquin	80	80	80	80
Shasta	7	62	62	62
Siskiyou	40	40	40	40
Solano	0	131	130	130
Stanislaus	105	205	105	105
Tulare	0	138	20	0
Tulare	40	40	40	40
Unknown	16	155	26	16
Sonoma	15	15	15	15
Grand Total	3,201	5,160	4,661	6,856



Workshops – Future Scenario Development

- 2012 LTPP and 2013-14 TPP
- CPUC Auditorium, April 11-12
- To discuss both process and technical approaches for scenario creation

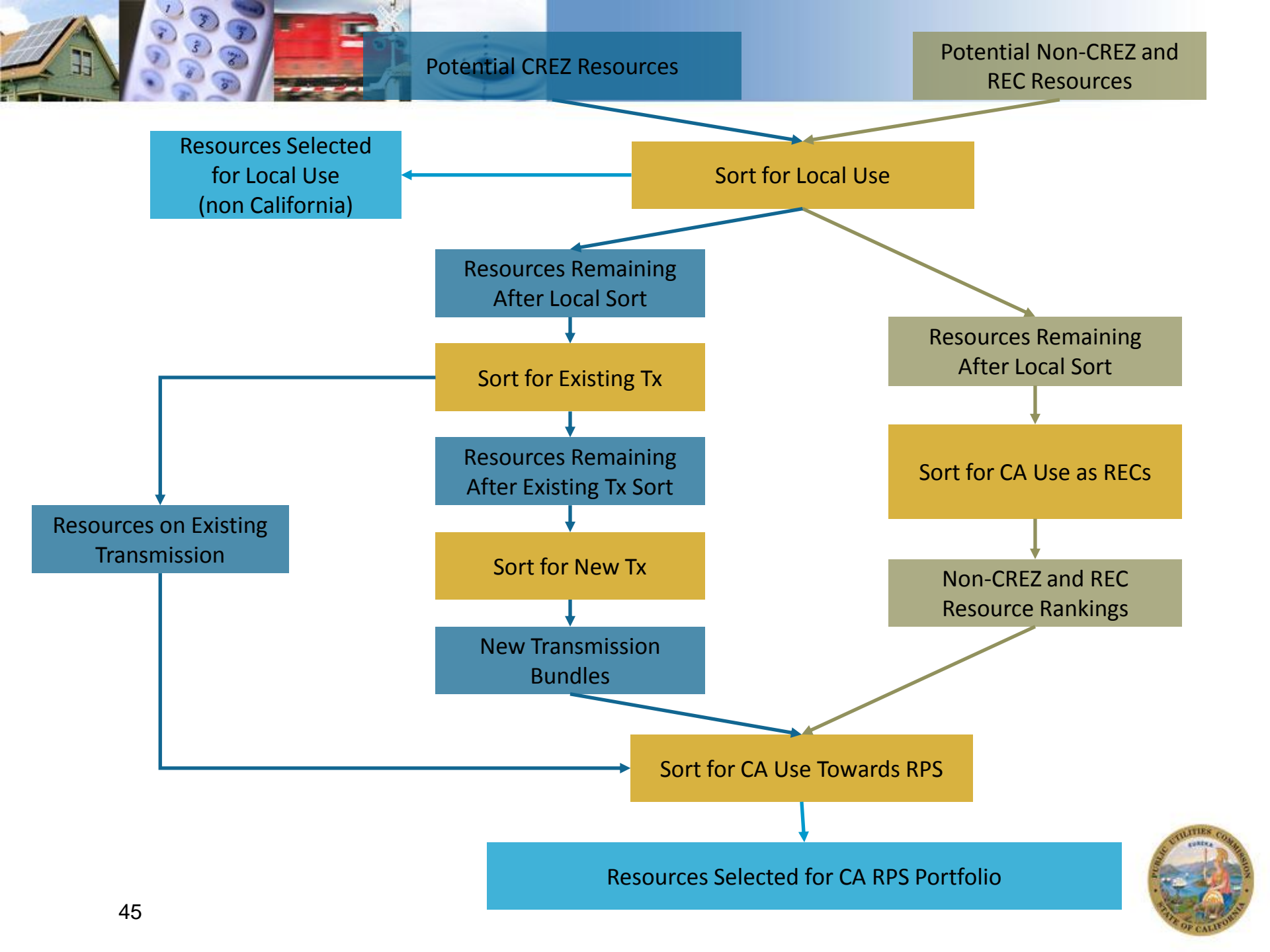




For more details:

- <http://www.cpuc.ca.gov/PUC/energy/Procurement/LTPP/LTPP2010/2010+LTPP+Tools+and+Spreadsheets.htm>
- [Kevin Dudney, CPUC Staff](#)
 - Kevin.dudney@cpuc.ca.gov
 - [415.703.2557](tel:415.703.2557)





Potential CREZ Resources

Potential Non-CREZ and REC Resources

Resources Selected for Local Use (non California)

Sort for Local Use

Resources Remaining After Local Sort

Resources Remaining After Local Sort

Sort for Existing Tx

Sort for CA Use as RECs

Resources Remaining After Existing Tx Sort

Non-CREZ and REC Resource Rankings

Resources on Existing Transmission

Sort for New Tx

New Transmission Bundles

Sort for CA Use Towards RPS

Resources Selected for CA RPS Portfolio

