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Docket Number:	15-RETI-02
Project Title:	Renewable Energy Transmission Initiative 2.0
TN #:	211118
Document Title:	04-18-16 Presentation by Brian Turner
Description:	N/A
Filer:	Misa Milliron
Organization:	California Natural Resources Agency
Submitter Role:	Public
Submission Date:	4/18/2016 10:48:12 AM
Docketed Date:	4/18/2016

Renewable Energy Transmission Initiative v2.0

Transmission Assessment Focus Areas

Introduction and Next Steps

April 18, 2016

Brian Turner

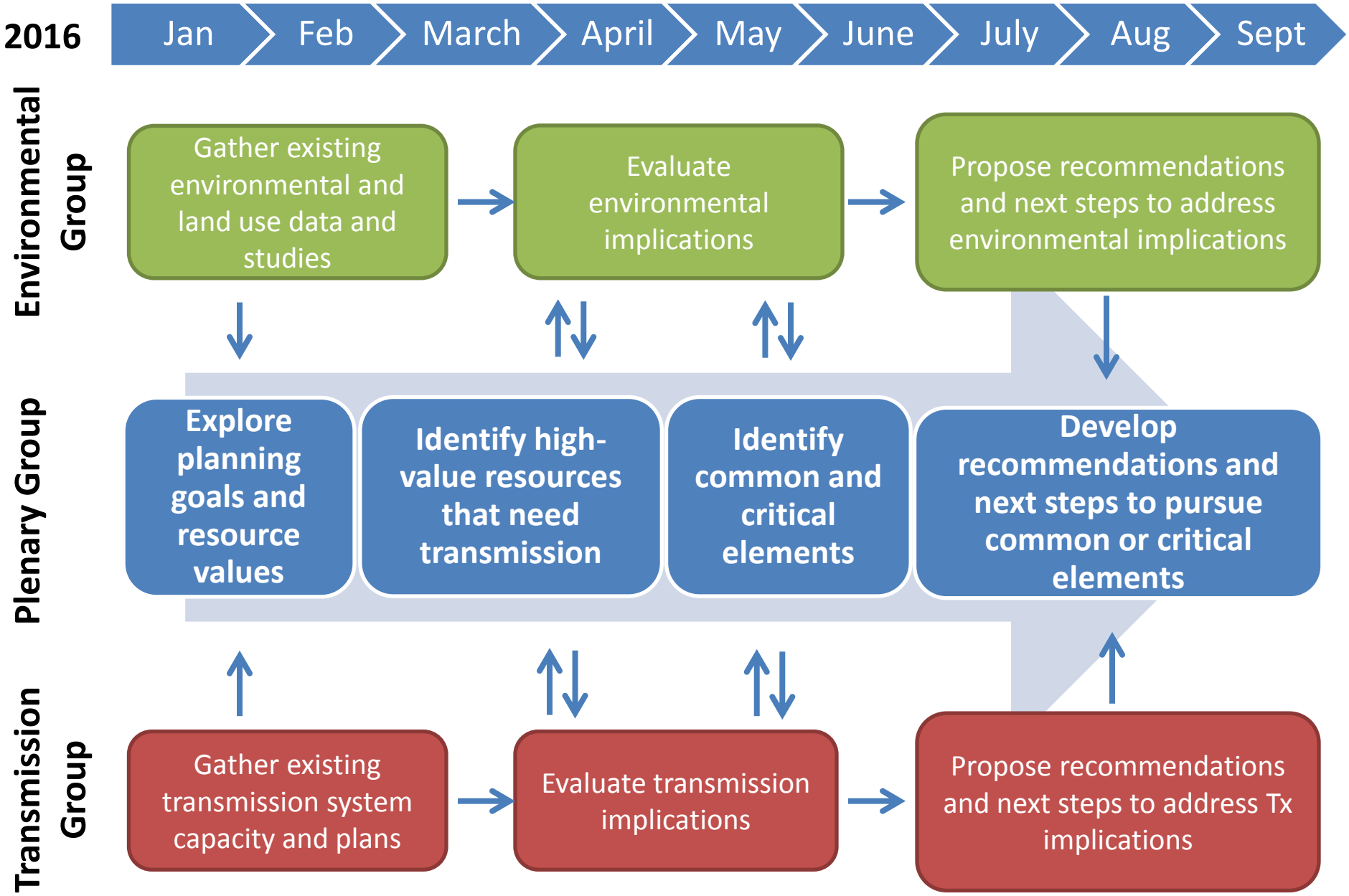
RETI 2.0 Project Director

California Natural Resources Agency

Agenda

- Introduction to Focus Areas
  - RETI 2.0 process overview
  - Transmission Assessment Focus Area approach
  - Sources and analytic questions
- Examples of Focus Areas
- Next Steps

RETI 2.0 Process and Timeline



Transmission Assessment Focus Area: Approach

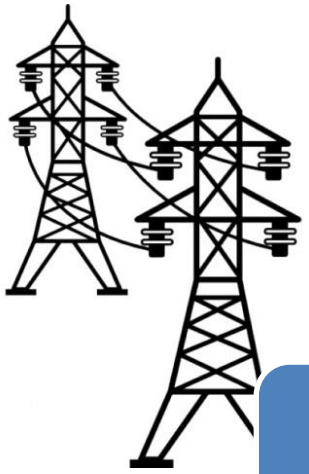
Explore planning goals and resource values

1. How much renewables *might* we need?
   - Bookend scale of renewable need by 2030
   - Sources include IEPR, Pathways
2. Which resources *might* be important by 2030?
   - Review resource costs and values in 2030 context to identify resources and zones of potential value for 2030
   - Sources include industry and stakeholder comments, academic and government studies

Identify high-value resources that need transmission

3. How much renewables *might* come from different areas?
   - Bookend range of renewable resources from specific areas that may be developed by 2030
   - Sources include comments, studies
4. *Might* this level of renewables require new transmission?
   - Match resource ranges to existing transmission capacity and **identify where resource range exceeds transmission capacity**
   - Sources include TPP and WECC studies, stakeholder comment

Transmission Assessment Focus Area: Approach

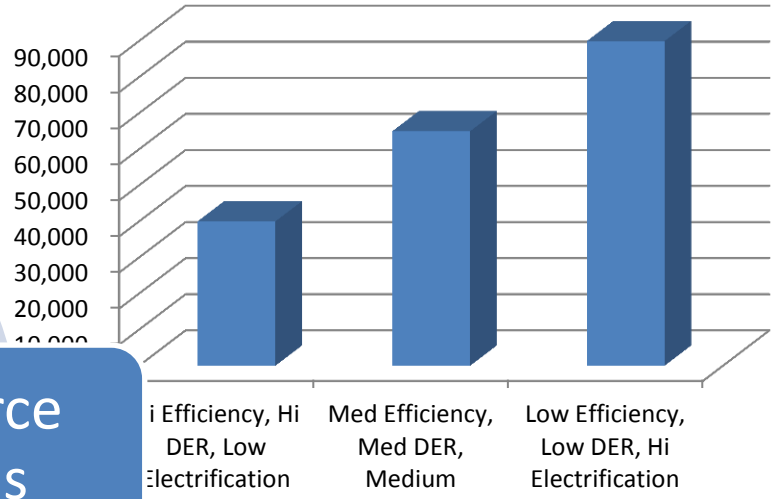


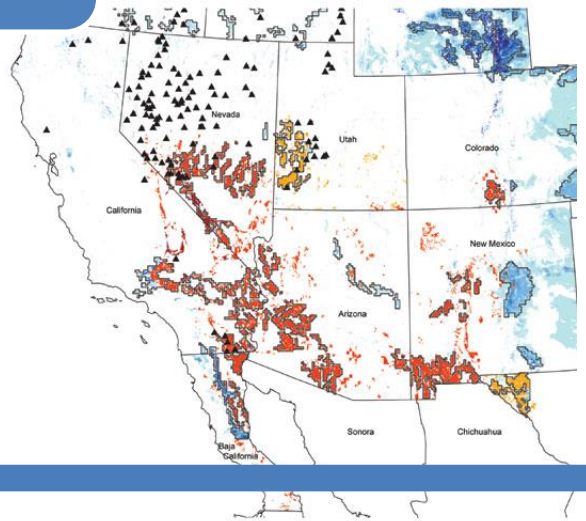
Planning Goals

Existing Tx Capacity

Resource Values

Resource Scenarios





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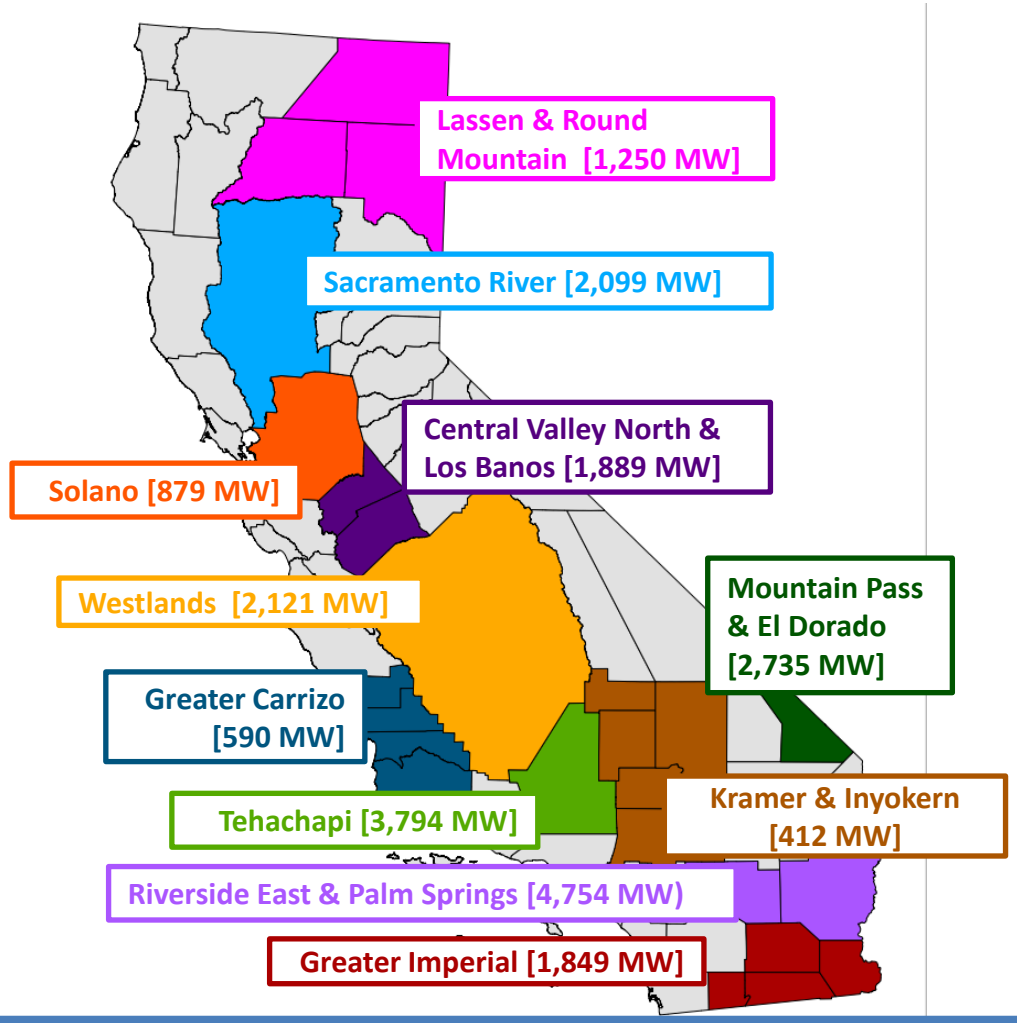
Transmission Assessment Focus Area: Sources

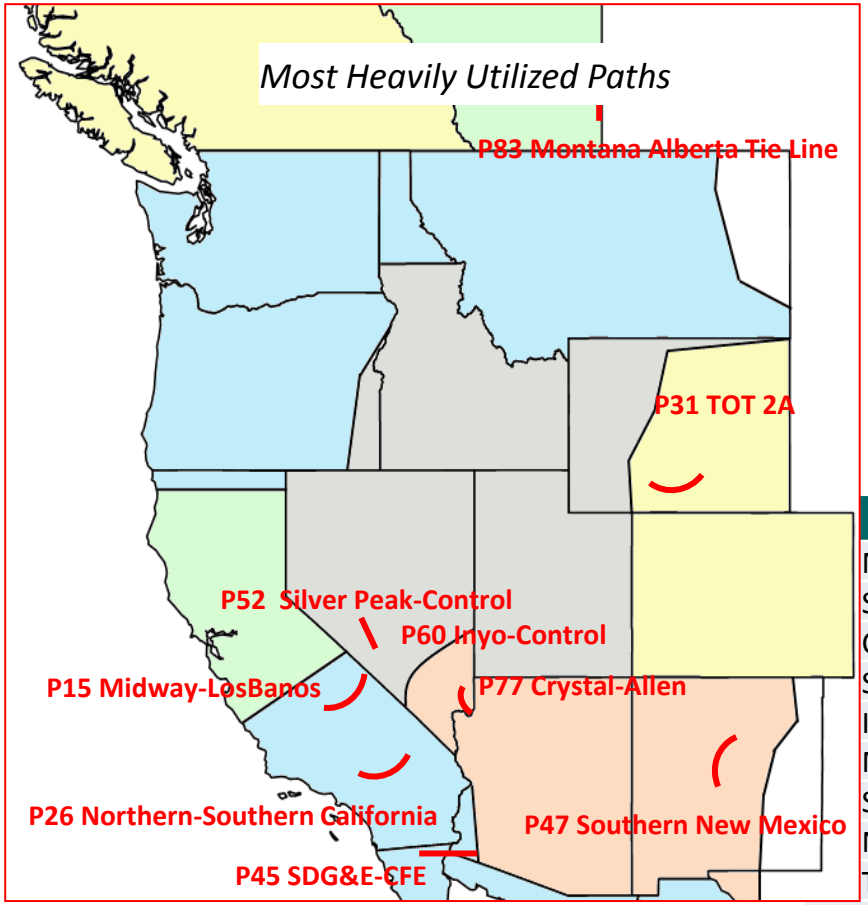
- **Utility, developer, and stakeholder comments**
- Resources in **CAISO interconnection queue**
- Resources in **CEC project database**
- **DRECP & San Joaquin Valley study results**
- 2030 sensitivity studies from **RPS Calculator v.6.2**
- **Low Carbon Grid Study and sensitivities**
- **WECC/TEPPC studies**
- Portfolios developed by **environmental (or other) stakeholders**
- Additional stakeholder input
- Other studies?

Transmission Assessment Focus Area: Energy-Only Study

- In 2015-16 TPP, the ISO developed estimates of how much new generation could be integrated on the existing transmission system if full capacity deliverability was not required (i.e. energy-only)
- In total, the ISO's estimates suggest **~22,000 MW** of new generation could be interconnected to the existing system
- **RETI 2 Question: Reasons why resources in some areas may exceed existing capacity, and by how much?**



Transmission Assessment Focus Area: Path and Intertie Studies



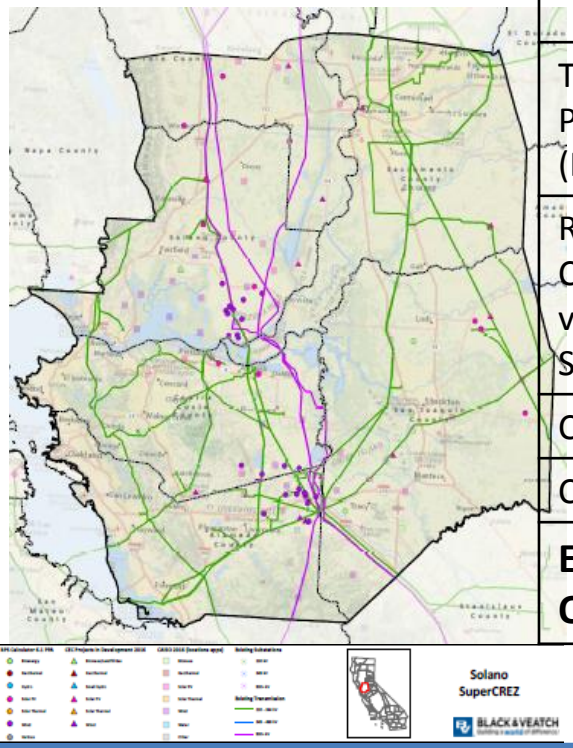
- Western Electricity Coordinating Committee identify "Heavily Utilized Paths" under future scenarios
- Western Tx project proponents identify intertie delivery points in to California
- **RETI 2 Questions: Which paths or interties are most impacted? Which western expansion options provide most optionality or serve multiple goals?**

Path	75%	90%	99%
Montana Alberta Tie Line	48.33%	37.40%	30.99%
Silver Peak-Control 55 kV	33.38%	23.39%	0.00%
Crystal-Allen	56.56%	21.62%	4.18%
SDG&E-CFE	20.26%	17.14%	15.36%
Inyo-Control 115 kV Tie	36.98%	17.09%	9.14%
Midway-LosBanos	22.81%	14.59%	10.33%
Southern New Mexico (NM1)	22.15%	11.67%	7.46%
Northern-Southern California	19.85%	9.59%	5.70%
TOT 2A	15.03%	9.54%	6.64%
P01 Alberta-British Columbia	12.22%	7.79%	5.46%

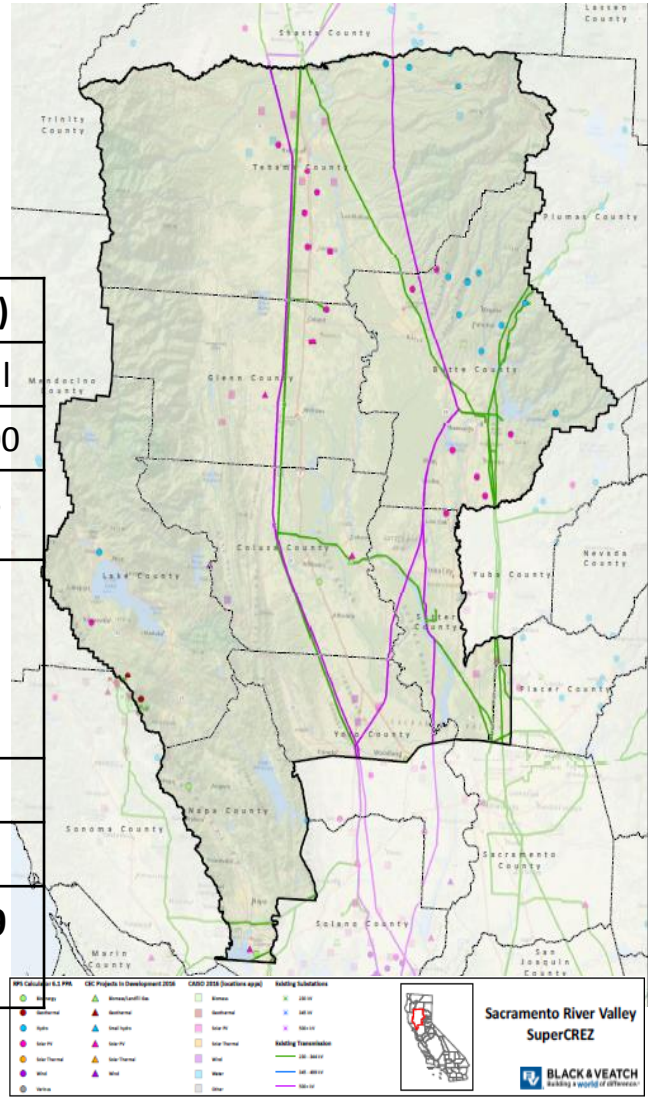
Preliminary Focus List

- SuperCrez
  - Lassen & Round Mountain
  - Sacramento River
  - Solano
  - Central Valley North & Los Banos
  - Westlands
  - Greater Carrizo
  - Kramer & Inyokern
  - Mountain Pass & El Dorado
  - Riverside East & Palm Springs
  - Tehachapi
  - Greater Imperial
- Interconnections
  - California-Oregon Intertie
  - Control
  - Path 46
    - El Dorado
    - Palo Verde

Solano and Sacramento River Valley



Data / Studies		New Capacity (MW)	
		Solano	Sac Val
Technical Potential (RPS Calc)	Solar PV	245,000	226,700
	Wind	1,352	6,406
RPS Calculator v6.2 2030 Sensitivity	Max wind	1500	2072
CAISO Queue		242	
CEC Project Database		183	167
Existing Energy-Only Tx Capacity		**879**	**2,099**



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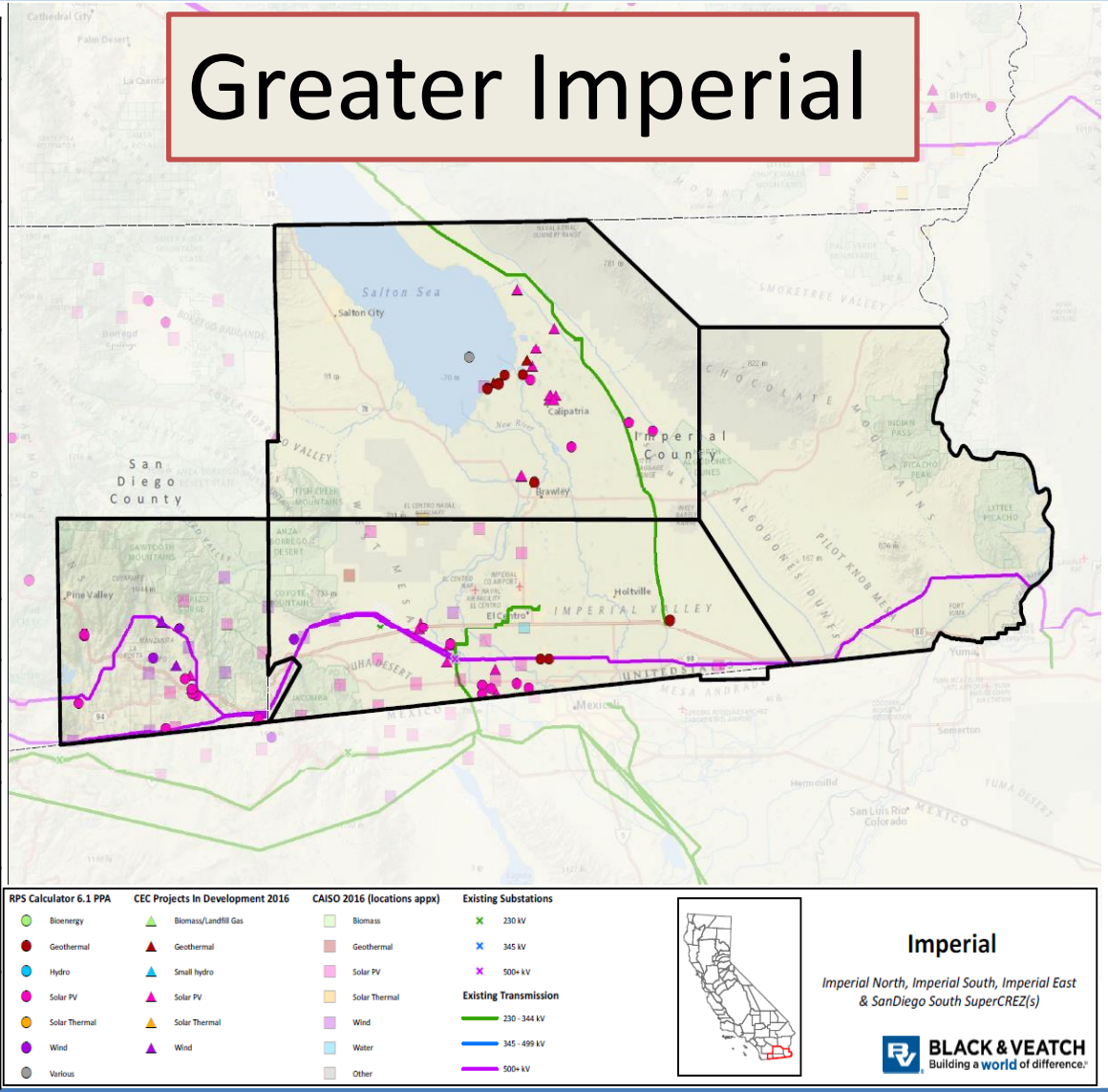
Greater Imperial

Data / Studies		New Capacity (MW)	
		RPS Calc	NREL
Technical Potential by Resource	Solar PV	137,000	32,000
	Wind	753	
	Geo	1,384	2,940
RPS Calculator v6.2 2030 Sensitivity	California	1,367	
	California Env Pref	1,849	
	WECC Wide	1,158	
CAISO Queue		3,052	
CEC Project Database		2,140	
NREL study by 2030 (geo)	Geo	1050 to 1800	
	Solar	1300 to 1800	
CEERT Salton Sea Study		1250 (geo	
Existing Energy-Only Tx Capacity		**1849 MW**	



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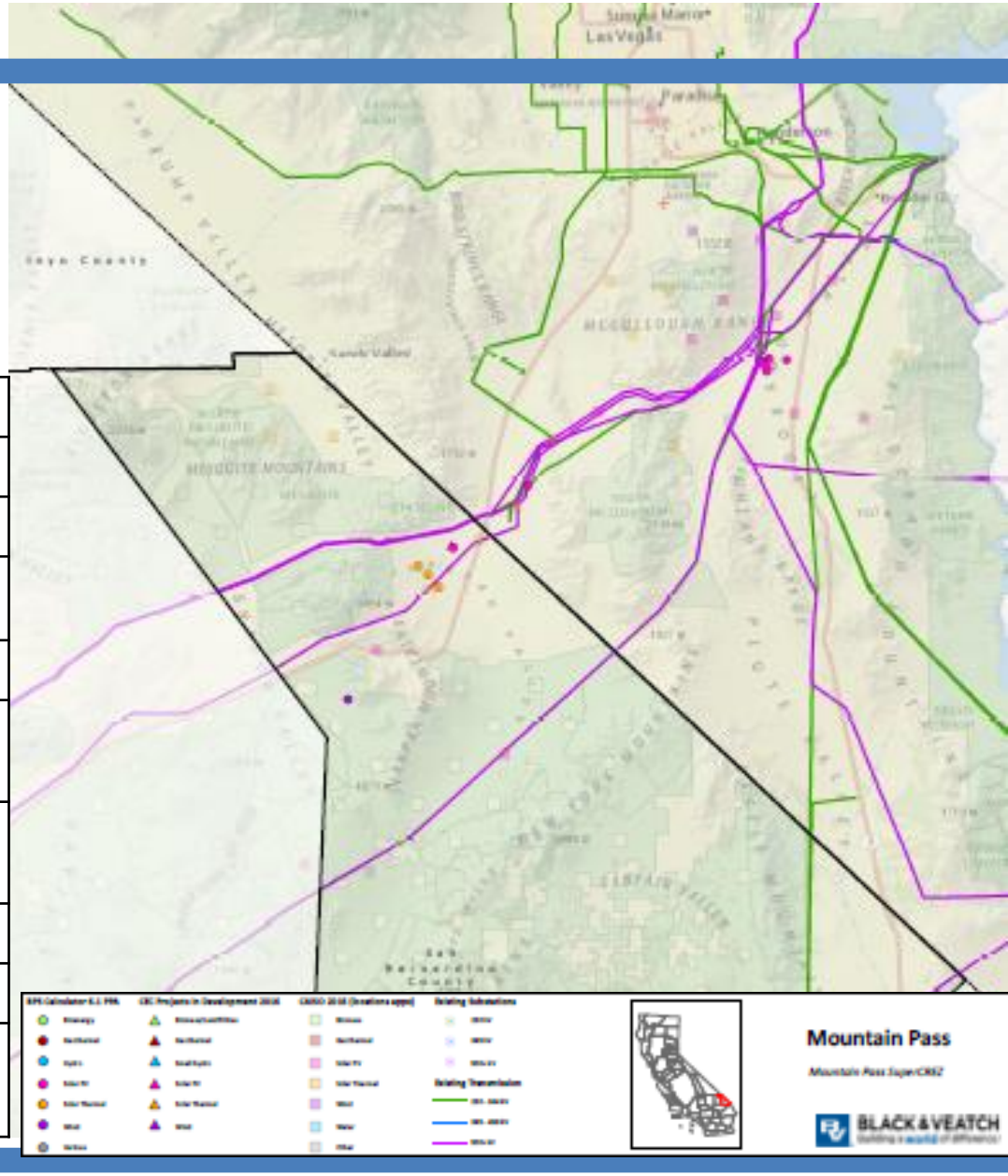
Mountain Pass and El Dorado

Data / Studies		New Capacity (MW)	
		Mt. Pass	OOS (WY)
Technical Potential (RPS Calc)	Solar PV	5,772	n/a
	Wind	n/a	39,400
RPS Calculator v6.2 2030 Sensitivity	California	705	n/a
	California Env Pref	475	n/a
	WECC Wide	462	2273
CAISO Queue		800	
CEC Project Database		300	
Existing Energy-Only Tx Capacity		**2,735**	



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Next Steps

- Discuss full range of Focus Areas at RETI 2.0 Agency Executives' Workshop scheduled for May 2
  - Propose range of resource scenarios by Focus Area for further assessment
  - Revise according to stakeholder comment
- Transmission Technical Input Group (TTIG) will assess transmission implications of each resource scenario / Focus Area in May & June
- Environmental and Land Use Technical Group (ELUTG) will assess environmental implications
- Present initial results in late June & July

Questions, comments, suggestions?

http://www.energy.ca.gov/reti/

and click on the “Submit eComment” link

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