



# CTPG Study Stakeholder Conference Call

12/17/09

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# Agenda

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- Call Objectives
- CTPG Website
- CTPG Background
- Study Objectives and Scope
- Input Assumptions
- Generation Dispatch Methodology
- Next Steps
- Initial Study Schedule

# Objectives of today's call

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- This is 2<sup>nd</sup> CTPG stakeholder meeting
  - 1<sup>st</sup> meeting was on August 11, 2009
  - Discussed CTPG principles, organization & Study Plan
  - Presentation material available at CTPG website
- Today's meeting will focus on:
  - Technical aspects of the current CTPG study
  - Review the study plan components and provide discussion to increase stakeholder understanding
  - Receive comments from stakeholders
- We welcome comments through CTPG website

# CTPG Website: [www.ctpg.us](http://www.ctpg.us)

Home: CTPG Overview and principles

Committees and Leadership: Organizational structure. Will rotate on annual basis.

Stakeholder Meetings: Meeting announcements, posting of meeting materials for comment. Comment link.

Study Plans and Results: Posting of draft study plans and studies. Final posting of final study results for each study phase.

Document Download: Location for larger informational files:

Quick Links: easy reference to related sites.

# CTPG Background

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- Forum for conducting state-wide joint transmission planning
- Formed as a result of discussions facilitated by FERC to address California's transmission needs in a coordinated manner respecting various business models
- Committed to developing a California state-wide transmission plan to meet the state's 33% renewable goal by 2020

# Study Objectives

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- Develop first iteration for statewide plan to meet 33% renewable generation goals
- Employ and be consistent with RETI results
- Coordinate with existing utility plans
- Identify potential changes to RETI conceptual transmission plan
- Conduct the studies in a timely fashion to support other planning activities

# Scope Objectives

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- This study phase does:
  - Include significant groundwork to construct accurate benchmark cases representing year 2020
  - Develop additional tools for future scenarios
  - Provide results based on grid performance with expected simultaneous output of renewables for specific on- and off-peak hours in year 2020
- This study phase does not:
  - Determine a FINAL transmission plan
  - Base results on “deliverability” methodology:
    - all renewables at resource adequacy capacity output levels
    - imports into a control area fixed at historical levels
  - Specifically focus on Once Through Cooling (OTC) impacts

# Study Scope

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- Case A: 2020 Northern California adverse peak weather (90/10)
  - How much additional transmission is needed during a northern CA 1 in 10 peak to achieve 33% goals assuming high imports from the Pacific Northwest
- Case B: 2020 Southern California adverse peak weather (90/10)
  - How much additional transmission is needed during a southern CA 1 in 10 peak to achieve 33% goals without predetermining import flows
- Case C: 2020 (50/50) expected peak weather
  - Designed to evaluate capability of existing and planned grid
- Other cases under consideration include Spring/Autumn seasons, off-peak hours, Once-Through-Cooling impact, and different import levels
- Adhere to NERC, WECC, and each Member's Reliability Criteria



# Study Case Methodology

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- Step 0: Develop Benchmark Base Case:
  - Reflect the 2020 system for each scenario
  - WECC 2019 Heavy Summer case as seed case (includes Sunrise, Tehachapi 1-11, Colorado River-Devers-Valley, GPN, Barren Ridge)
  - Update CA peak demand according to the scenario
  - Maximize power transfers from Pacific Northwest in A0 case
  - Perform detailed contingency analysis to meet reliability criteria
- Step 1: Add Renewable Projects at 0 MW/ MVAR output
  - Modify grid to provide CREZ connections
  - Case A1 and B1: add major projects from RETI conceptual transmission plan (e.g., southern Nevada-Kramer-Los Angeles basin, Carrizo, Owens Valley upgrades)
  - Case C1: add selected RETI upgrades (e.g., Carrizo, Owens Valley upgrades)
  - Perform detailed contingency analysis to meet reliability criteria
- Step 2: Dispatch renewable generation in increments offset by equal decrements of fossil generation
  - Perform detailed contingency analysis to meet reliability criteria
  - Identify and review limiting constraints or violations

# Input Assumptions Overview

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- Baseline grid configuration from 2019 WECC “Heavy Summer” power flow case
- Peak Demand forecasts for 2020 case provided by load serving entities
- Renewable Energy Planning Target updated for CEC’s adopted 2009 IEPR retail sales forecast
- Renewable generation portfolios provided by load serving entities
- RETI Phase 2A results as detailed on following slides

# CTPG's 2020 Planning Target

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	CTPG (GWh)	RETI– Phase 2A (GWh)
Forecast Retail Load subject to California's renewable goals:	289,697	301,974
Renewable Portfolio Standard (RPS) Goal:	33%	33%
Renewable Portfolio Standard (RPS) Energy Requirement:	95,600	99,651
Existing and New Renewables expected to be on line by end of 2009:	39,324	36,807
Miscellaneous renewable resource additions:	2,670	3,134
subtotal:	41,995	39,941
<b>"Net Short":</b>	<b>53,605</b>	<b>59,710</b>
Identified Renewable Resource Additions:	55,535	95,536*
<b>Total Renewable Energy Production:</b>	<b>97,529</b>	<b>135,477*</b>
<b>Identified Renewable Energy as a Fraction of Retail Sales:</b>	<b>33.7%</b>	<b>44.9%*</b>

\*For purposes of developing a conceptual transmission plan that addresses uncertainties in the location of renewable resource development, RETI planned for renewable resource additions equal to approximately 1.6 times the RETI net short.

# Year 2020 Peak Demand

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- Each load serving entity provided peak demand forecasts for their service territory

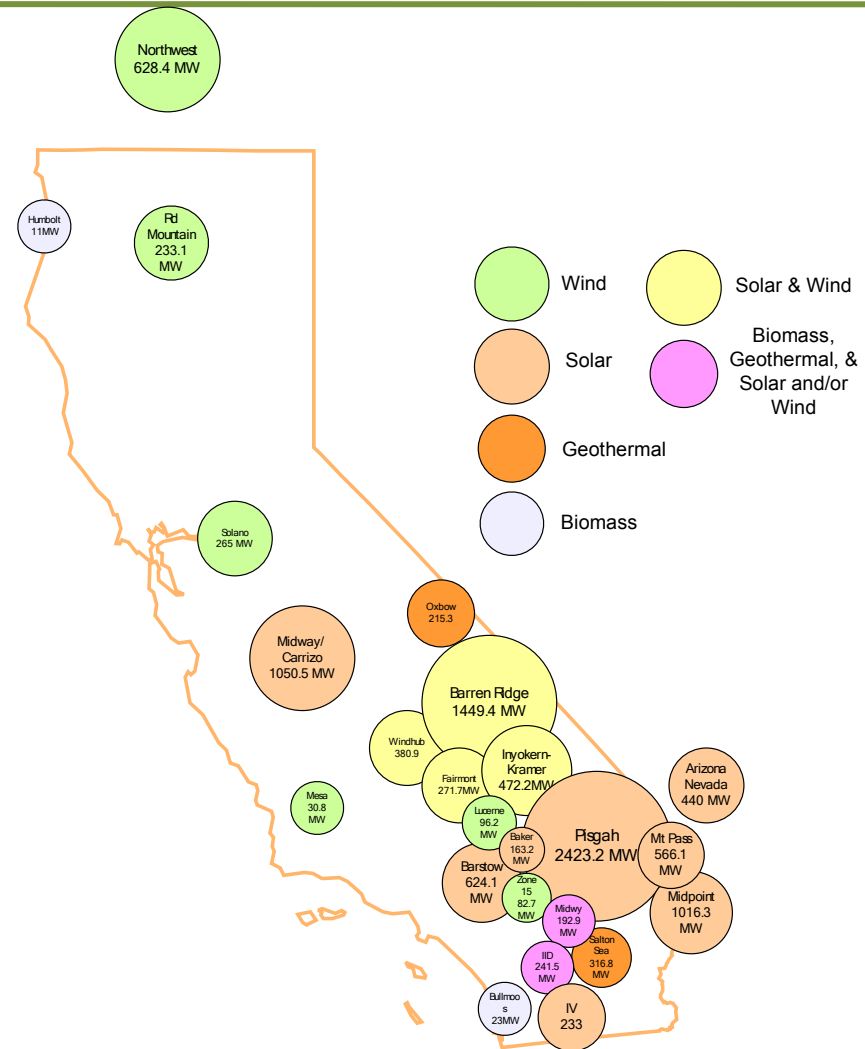
Area	LOAD (MW)	
	one-in-2-year	one-in-10-year
<b>SDG&amp;E</b>	4,913	5374
<b>LADWP*</b>	6,293	6,816
<b>IID</b>	1,246	1280
<b>SCE**</b>	25,573	27,540
<b>PG&amp;E**</b>	26,168	27,221
<b>SMUD</b>	3,182	3,634
<b>TID</b>	683	700
<b>Total</b>	<b>68,058</b>	<b>72,565</b>

\*LADWP includes Burbank and Glendale

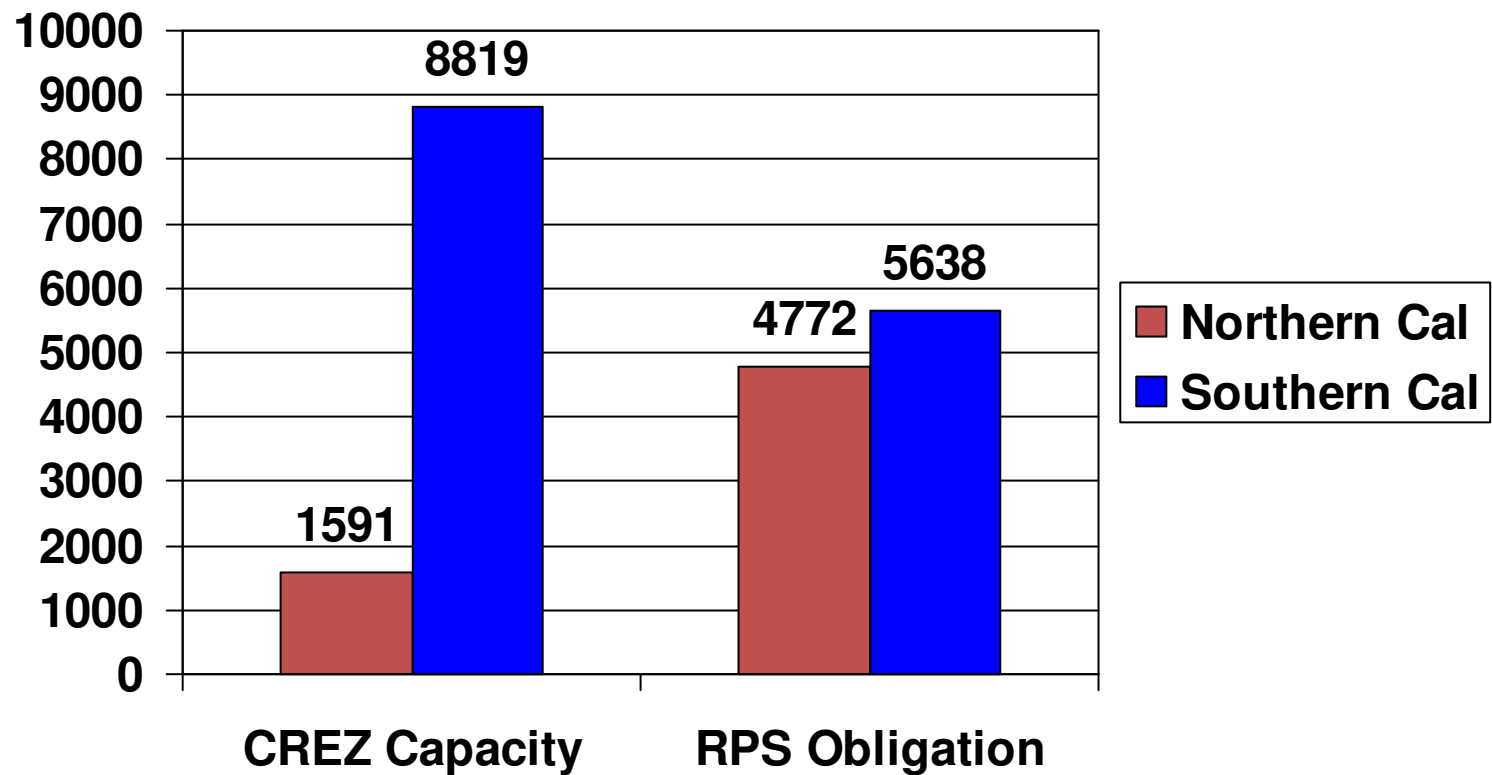
\*\* SCE and PG&E includes other Munis

# Renewable Generation Portfolio

- Each utility provided renewable procurement plans reflecting installed capacity, and in some cases the expected renewable dispatch at time of peak
- In other cases CTPG used generic factors to relate nameplate capacity to expected renewable dispatch for the hour of study (e.g., peak hour, off-peak hour)
- RETI's CREZ- and technology-specific annual capacity factors used to estimate renewable energy potential
- Rooftop PV and other distribution-level generation was considered as a reduction to load



# CREZ Capacity vs. RPS Obligation



# Renewable Generation

Location (Region/CREZ)	CTPG		RETI*	
	Installed Capacity (MW)	Identified Annual Renewable Energy Production (GWh)	Maximum Potential Installed Capacity adjusted for success rate (MW)	Identified Potential Annual Renewable Energy Production adjusted for success rate (GWh)
British Columbia	0	0	340	1849
Washington	963	2594	0	0
Montana	413	1111	N/A	N/A
Idaho	130	350	N/A	N/A
Oregon	1637	4408	392	3062
Round Mountain -A	0	0	101	710
Round Mountain -B	78	319	49	196
Lassen North	873	2262	387	999
Lassen South	0	0	108	292
Nevada N	0	0	115	822
Nevada C	239	1886	352	2624
Nevada S	217	502	N/A	N/A
Owens Valley	0	0	370	954
Inyokern	242	467	642	1669
Kramer	344	988	1693	4370
Mountain Pass	768	1777	438	1145
San Bernardino - Baker	825	1870	969	2299
Barstow	850	1985	617	1546
Pisgah	3248	7763	673	1658
San Bernardino - Lucerne	174	560	800	2150
Twentynine Palms	0	0	477	1219
Victorville	0	0	432	1128
Tehachapi	3868	10189	5514	15716
Fairmont	345	862	929	2734

# Renewable Generation (Continued)

Location (Region/CREZ)	CTPG		RETI*	
	Installed Capacity (MW)	Identified Annual Renewable Energy Production (GWh)	Maximum Potential Installed Capacity adjusted for success rate (MW)	Identified Potential Annual Renewable Energy Production adjusted for success rate (GWh)
Needles	0	0	122	313
Iron Mountain	0	0	1297	3065
Arizona	333	740	0	0
Riverside East	1562	3471	2785	6725
Palm Springs	147	500	203	685
Imperial North-A	352	2775	1370	10626
Imperial North-B	386	1843	483	1190
Imperial South	466	1091	981	2420
Imperial East	15	43	429	1045
Baja-B (Santa Catarina)	0	0	2632	8931
Baja-A (La Rumorosa)	0	0	2368	8035
San Diego South	0	0	179	508
San Diego North Central	0	0	74	195
San Diego	23	171	N/A	N/A
Humboldt	11	82	N/A	N/A
Solano	408	1248	236	756
Cuyama	0	0	211	471
Carrizo North	0	0	422	896
Carrizo South	1545	3429	1024	2197
Santa Barbara	92	249	114	312
<b>Total</b>	<b>20553</b>	<b>55535</b>	<b>30327</b>	<b>95536</b>

\* For purposes of developing a conceptual transmission plan that addresses uncertainties in the location of renewable resource development, RETI planned for renewable resource additions equal to approximately 1.6 times the RETI net short.



# Transmission Projects in Base Case

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- Transmission upgrades in the 2019 Heavy Summer WECC Base Case
  - SCE's Tehachapi Segments 1-3
  - SDG&E's Sunrise Powerlink
  - SCE's Tehachapi Segments 4-11
  - SCE's 500 kV Colorado River-Devers-Valley project
  - LADWP's/IID's 500 kV Green Path North project
  - LADWP's Barren Ridge/Haskell Canyon/Rinaldi upgrades
  - IID's upgrade of Ramon-Devers and Coachella Valley-Devers

# Transmission Projects Added

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- Transmission upgrades added to Cases A1, B1 and C1 are shown in the Attachment.

# Dispatch Methodology

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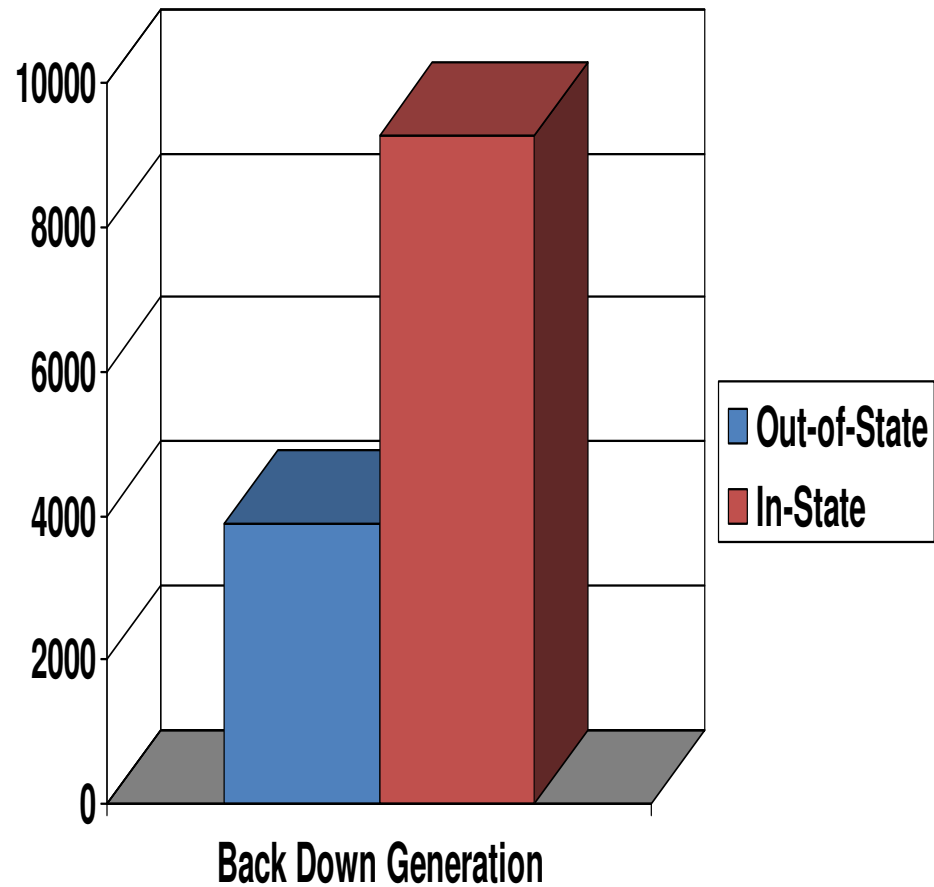
- Objective is to reduce fossil generation to allow for renewable dispatch to meet 33% goal
- Fossil Generation reduced in blocks, equal increments of renewable generation
- 70/30 split between California fossil generation and out-of-state fossil generation
- Decrementing done in a merit-order fashion (least economic reduced first) with heat rate data used for economic ranking from the latest TEPPC 2017 economic database

# Example

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- Units in the each 1000 MW blocks are decremented equally until all units in the block are turned off.
- Decrements between minimum output level and 0 MW not allowed; i.e., unit is turned off
- The units in the next block are then reduced in the same fashion, and so on.
- Nuclear and hydro units are not decremented in the summer peak cases.

# Back Down Generation



Area	MW	%
Out-of-State	3890	29.5%
In-State	9275	70.5%
Total	13165 (*)	100%

\* Includes backdown for PV rooftop

# Dispatchable Fossil Units

Unit Type	MW Dispatchable	Dispatch %
<b>Internal Units</b>	<b>36,241</b>	<b>70%</b>
California Gas Turbines (FLHR > 10,000 BTU/kWh)	4,195	
California Gas-Fired Steam Units (FLHR > 10,000 BTU/kWh)	6,697	
California Gas Turbines (FLHR < 10,000 BTU/kWh)	25	
California Gas-Fired Steam Units (FLHR < 10,000 BTU/kWh)	7,414	
California Combined-Cycle Units (FLHR > 9,000 BTU/kWh)	0	
California Combined-Cycle Units (FLHR < 9,000 BTU/kWh)	17,910	
<b>External Units</b>	<b>51,119</b>	
External Gas Turbines (FLHR > 10,000 BTU/kWh)	8,983	
External Gas-Fired Steam Units (FLHR > 10,000 BTU/kWh)	5,362	
External Gas Turbines (FLHR < 10,000 BTU/kWh)	1,686	
External Gas-Fired Steam Units (FLHR < 10,000 BTU/kWh)	859	
External Combined-Cycle Units (FLHR > 9,000 BTU/kWh)	460	
External Combined-Cycle Units (FLHR < 9,000 BTU/kWh)	33,769	
Coal Units	8,450	
<b>Total dispatchable generation</b>	<b>95,810</b>	<b>100%</b>

# Next Steps

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- Receive comments and incorporate them to the studies as much as possible
- Continue study activities on all of the cases with emphasis on the Cases A, B & C
- Prepare draft report
- Conduct the 3<sup>rd</sup> stakeholder meeting
- Issue final report
- Prepare for the follow-up studies recommended by the 2010 final report
- Develop a new Workplan for next year's studies

# Initial Study Schedule

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Item	Date
Study Plan stakeholder meeting	12/17/09
Comment period	12/8/09 – 12/21/09
Draft results report	1/5/10
Comment period	1/5/10 – 1/15/10
Stakeholder meeting (San Diego)	1/20/10
Results report	2/15/10

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# Thank You!

# Questions?