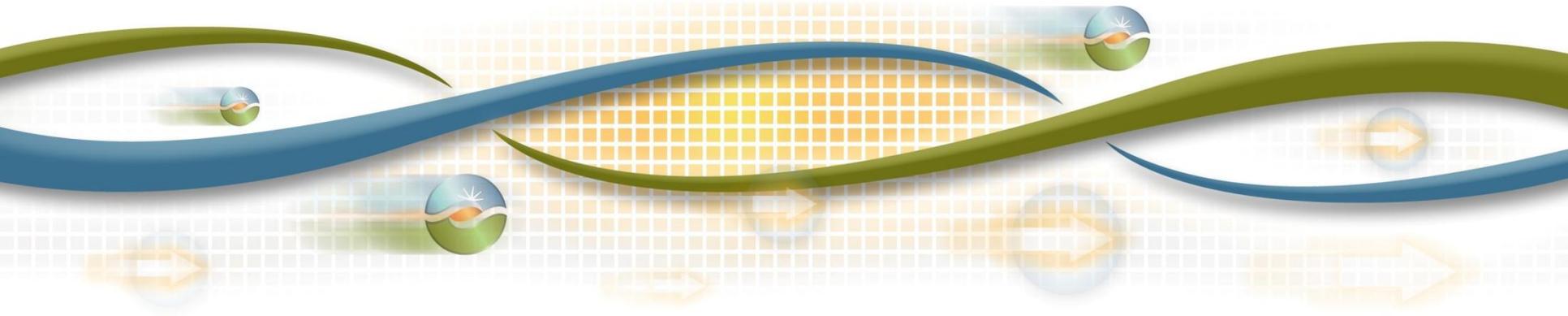




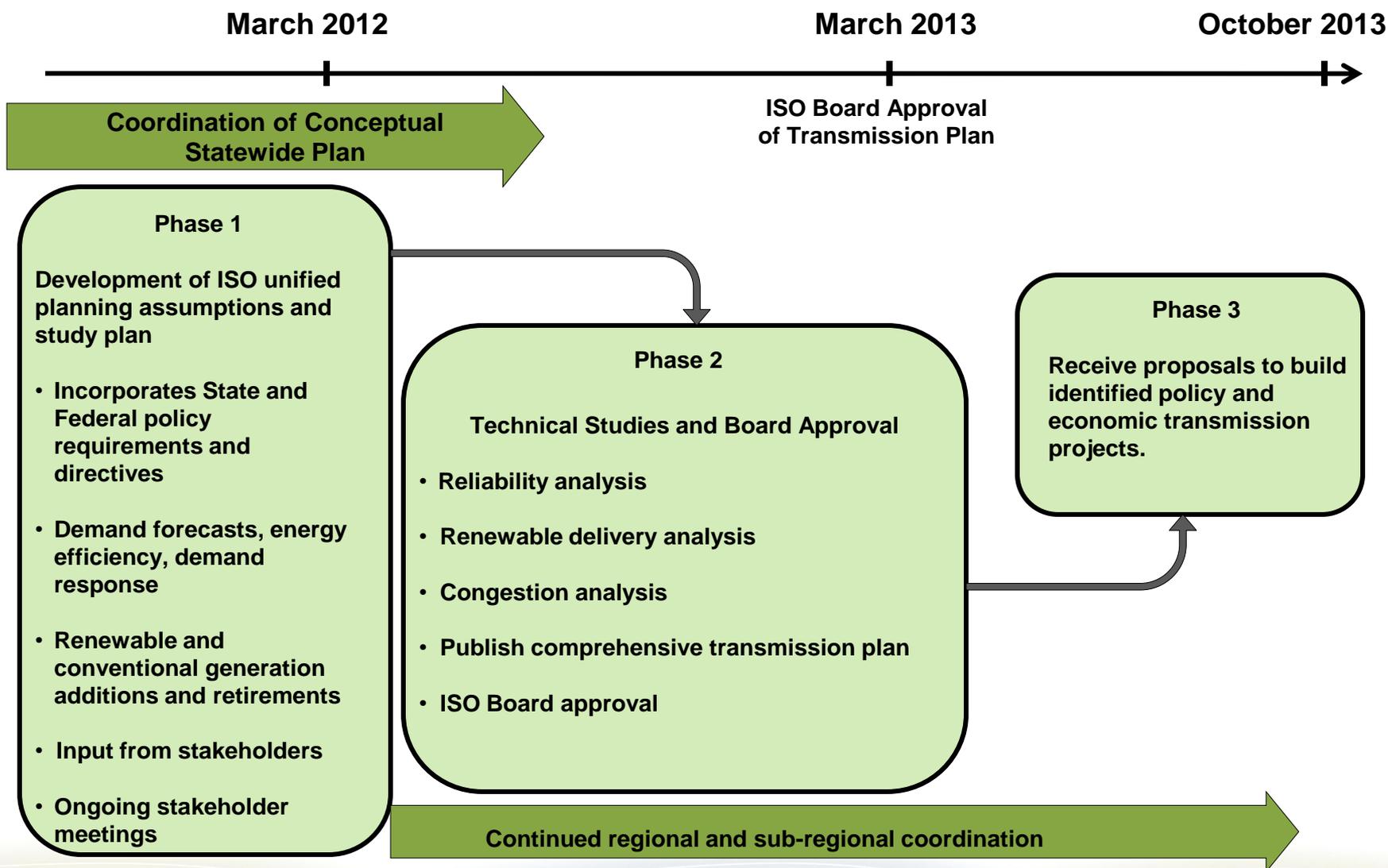
Unified Planning Assumptions & Study Plan *Transmission Planning Process*

2012/2013 ISO Transmission Plan Stakeholder Meeting

Neil Millar
Executive Director, Infrastructure Development
February 28, 2012



2012/2013 Transmission Planning Process



2011/2012 Transmission Planning Process Reliability Projects for Economic Assessment

Tariff requirement for Assessment of Reliability Projects for Economic Benefit

- ISO Tariff section 24.6.2 identified that the Participating TO with a PTO Service Territory in which the transmission upgrade or addition deemed needed under this Section 24 will have the responsibility to construct, own and finance, and maintain such transmission upgrade or addition.
- FERC Order on Compliance Filing –February 1, 2012
 - Reliability projects that are found to provide additional benefits will be subject to competitive solicitation as economic or policy-driven projects;
 - if its economic benefits exceed ten (10) percents of its costs; and
 - unless the project involves an upgrade to or addition on an existing facility of a participating transmission owner, the construction of facilities on a participating transmission owner’s right-of-way, or the construction or ownership of facilities within a participating transmission owner’s substation, then the participating transmission owner will construct and own such upgrade or addition.

Economic Benefit Methodology

- The assessment of economic benefit takes in to account:
 - congestion benefits
 - transmission line loss benefits
 - any other identified financial benefits
 - annual benefits compared to the leveled annual revenue requirement necessary to support the cost of the project.

Reliability Projects Assessed for Economic Benefit

- Two projects determined as needed for reliability in the 2011/2012 Transmission Plan have been assessed for potential economic benefit based per the February 1, 2012 FERC Order on Compliance Filing.
 - Embarcadero-Potrero 230 kV cable project
 - Cressey-North Merced 115 kV line

Embarcadero-Potrero 230 kV Line Project

Description:

- Construct a new 230 kV underground cable between Embarcadero and Potrero P.P. Substations
- Install 230 kV bus and 230/115 kV 420 MVA transformer at Potrero P.P. Substation

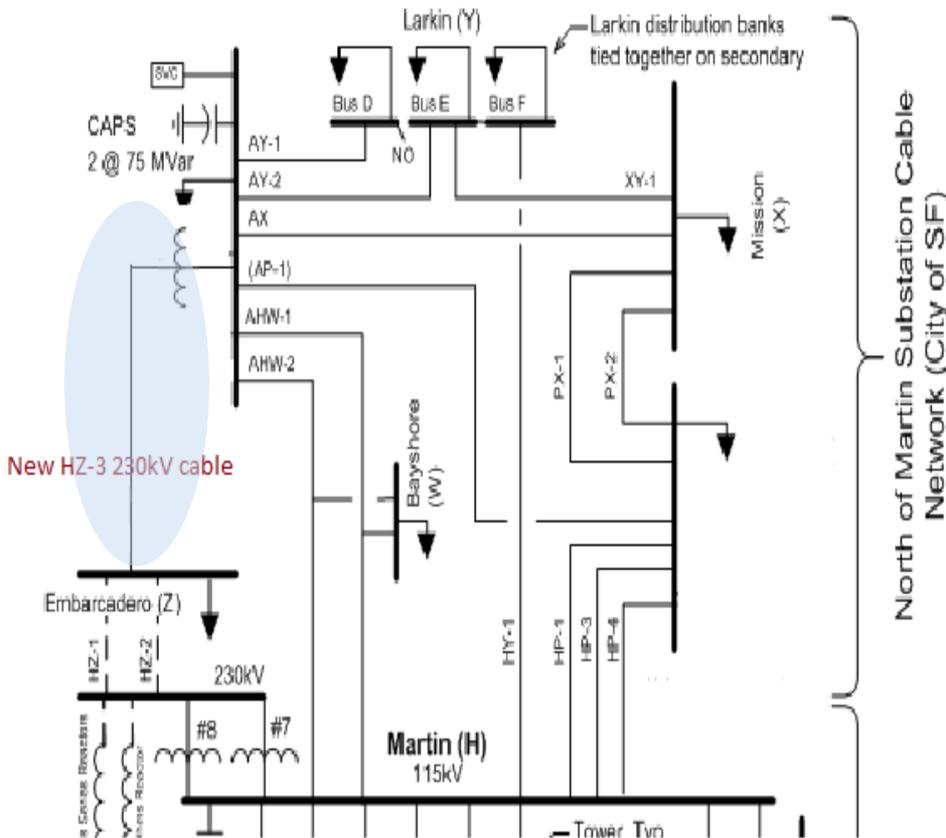
Estimated Cost of Project:

\$130 – 150 million

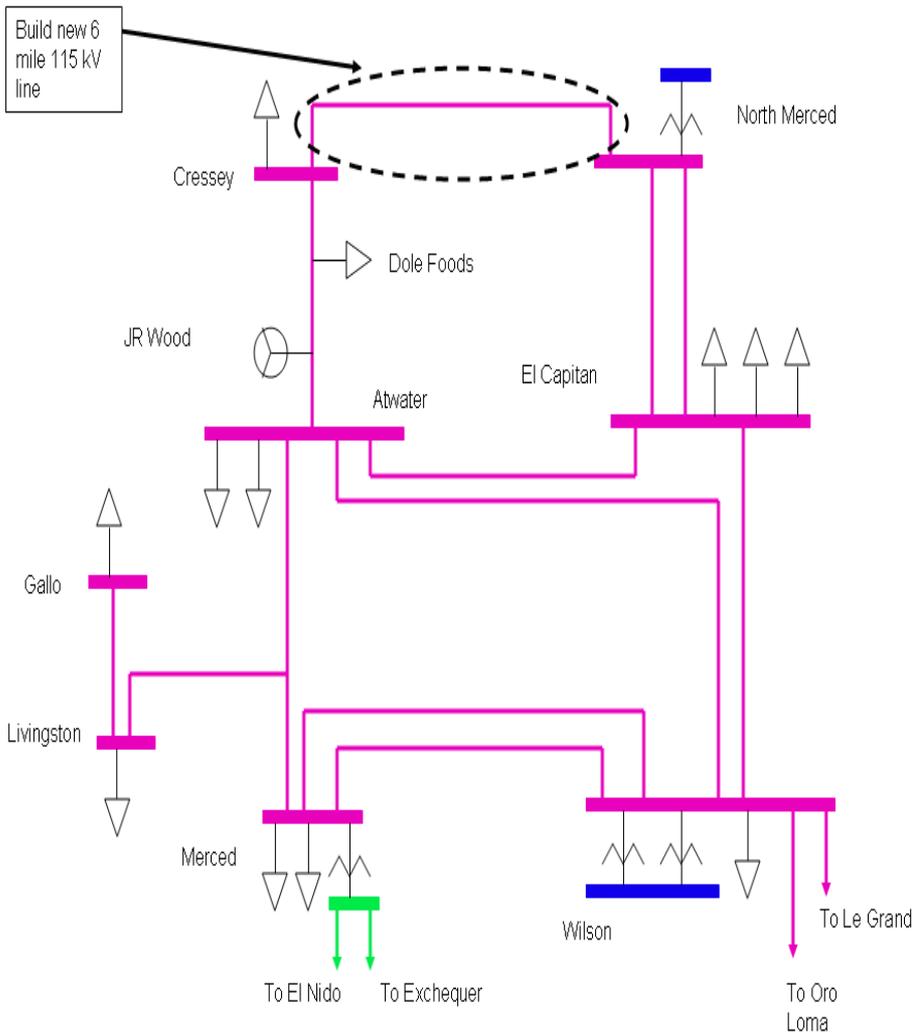
Assessment:

The planned transmission development does not result in:

- a reduction in system losses: or
- address any identified congestion in the area.



Cressey-North Merced 115 kV line



Description:

Build a new 6 mile 115 kV line from North Merced to Cressey substation with new breakers at each terminal

Estimated Cost of Project:

\$7 – 10 million

Assessment:

The planned transmission development results in:

- does not address any identified congestion in the area; and
- a minimal reduction in minimal system losses.
 - Reduction in studied losses ranged from 0 to 0.4 MW for the off-peak to peak area loadings respectively.

Conclusion of Economic Benefit Assessment

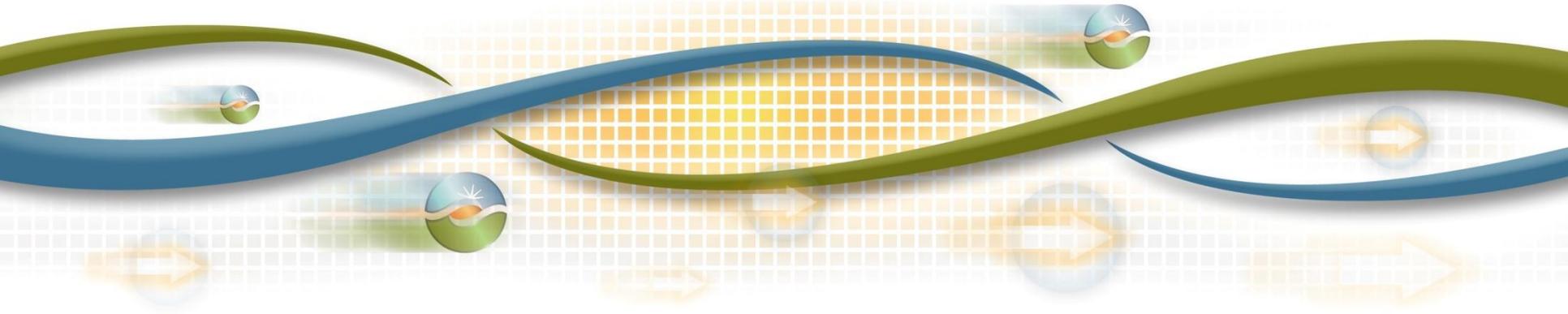
- The identified reliability driven projects do not provide additional economic benefit beyond the identified reliability need.
- With this the Participating TO with a PTO Service Territory in which the transmission upgrade or addition deemed needed will have the responsibility to construct, own and finance, and maintain such transmission upgrade or addition.



Unified Planning Assumptions & Study Plan *Study Plan Overview & Reliability Assessment*

2012/2013 ISO Transmission Plan Stakeholder Meeting

Bryan Fong, Sushant Barave & Haifeng Liu
Senior Regional Transmission Engineers
February 28, 2012



Overview

- Schedule and Milestones
- Proposed technical studies in 2012/2013 planning cycle
- Study information
- Reliability assessment assumptions and methodology

Schedule and Milestones

No	Due Date	2012/2013 Activity	Phase
1	December 15, 2011	The ISO sends a letter to neighboring balancing authorities, sub-regional, regional planning groups requesting planning data and related information to be considered in the development of the Study Plan and the ISO issues a market notice announcing a thirty-day comment period requesting demand response assumptions and generation or other non-transmission alternatives to be considered in the Unified Planning Assumptions.	I
2	January 16, 2012	PTO's, neighboring balancing authorities, regional/sub-regional planning groups and stakeholders provide ISO the information requested in the December 15 letter and market notice (see no.1 above)	I
3	February 21, 2012	The ISO develops the draft Study Plan and posts it on its website	I
4	February 28, 2012	The ISO hosts public stakeholder meeting #1 to discuss the contents in the Study Plan with stakeholders	I
5	March 13, 2012	Comment period for stakeholders to submit comments on the public stakeholder meeting #1 material and for interested parties to submit Economic Planning Study Requests to the ISO	I
6	Last week in March	The ISO specifies a provisional list of high priority economic planning studies, finalizes the Study Plan and posts it on the public website	I
7	Q2	ISO Initiates the development of the Conceptual Statewide Plan	I
11	TBD	Post CPUC portfolios (one week prior to stakeholder meeting)	II
12	TBD	The ISO hosts stakeholder meeting for the CPUC to present the portfolios	II
13	TBD	Comment period for stakeholders to submit comments on the public stakeholder meeting discussing portfolios	II
14	TBD	The ISO finalizes the portfolios and post on public website	II
15	July/August	ISO posts the Conceptual Statewide Plan on its website and issues a market notice announcing the posting	II
16	August/September	Stakeholders have a 20 day period to submit comments on the Conceptual Statewide Plan in the next calendar month after posting conceptual statewide plan (i.e. August or September)	II
17	August 15, 2012	Request Window opens	II
18	August 15, 2012	The ISO posts preliminary reliability study results and mitigation solutions	II
19	September 14, 2012	PTO's submit reliability projects to the ISO	II
20	September 26 – 27, 2012	The ISO hosts public stakeholder meeting #2 to discuss the study results, PTO's reliability projects, and the Conceptual Statewide Plan with stakeholders	II

Schedule and Milestones (continued)

No	Due Date	2012/2013 Activity	Phase
21	September 27 – October 11, 2012	Comment period for stakeholders to submit comments on the public stakeholder meeting #2 material	II
22	October 15, 2012	Request Window closes	II
23	End of October 2012	ISO post final reliability study results and mitigation solutions	II
24	December 4, 2012	The ISO posts an update on the preliminary policy driven & economic planning study results on its website	II
25	December 11 - 12, 2012	The ISO hosts public stakeholder meeting #3 to provide the updates on the preliminary policy driven & economic planning study results	II
26	December 12 – 21, 2012	Comment period for stakeholders to submit comments on the public stakeholder meeting #3 material	II
27	January 2013	The ISO posts the draft comprehensive Transmission Plan on the public website	II
28	February 2013	The ISO hosts public stakeholder meeting #4 to discuss the transmission project approval recommendations, identified transmission elements, and the content of the comprehensive Transmission Plan	II
29	Three weeks following the public stakeholder meeting #4	Comment period for stakeholders to submit comments on the public stakeholder meeting #4 material	II
30	March 2013	The ISO finalizes the comprehensive Transmission Plan and presents it to the ISO Board of Governors for approval	II
31	End of March	ISO posts the Final Board-approved comprehensive Transmission Plan on its site	II
32	April 2, 2013 – June 1, 2013	If applicable, the ISO solicits proposals to finance, construct, and own economically driven and category 1 policy driven elements identified in the comprehensive Transmission Plan (No. 24 above)	III
33	No later than June 7, 2013	The ISO posts the list of interested project sponsors received	III
34	No later than June 21, 2013	The ISO posts the list of qualified project sponsors who met the established criteria	III
35	July 15, 2013	Deadline for joint project sponsor notifications	III
36	No later than September 15, 2013	The ISO posts the list of approved project sponsors	III
37	No later than October 15, 2013	The ISO releases a detailed report on the approved project sponsors selected	III

2012/2013 Study Plan Technical Studies

- Reliability Assessments that are required to meet NERC, WECC, and ISO planning standards
- 33% Renewable Energy Goal - Transmission Analysis
- Local Capacity Requirements
- Economic Planning Study
- Long-Term Congestion Revenue Rights
- Once-Through Cooling & AB1318 - Updates to the 2011/2012 evaluation
- Long-Term reliability assessment with San Onofre and Diablo Canyon Nuclear power plants unavailable for operation

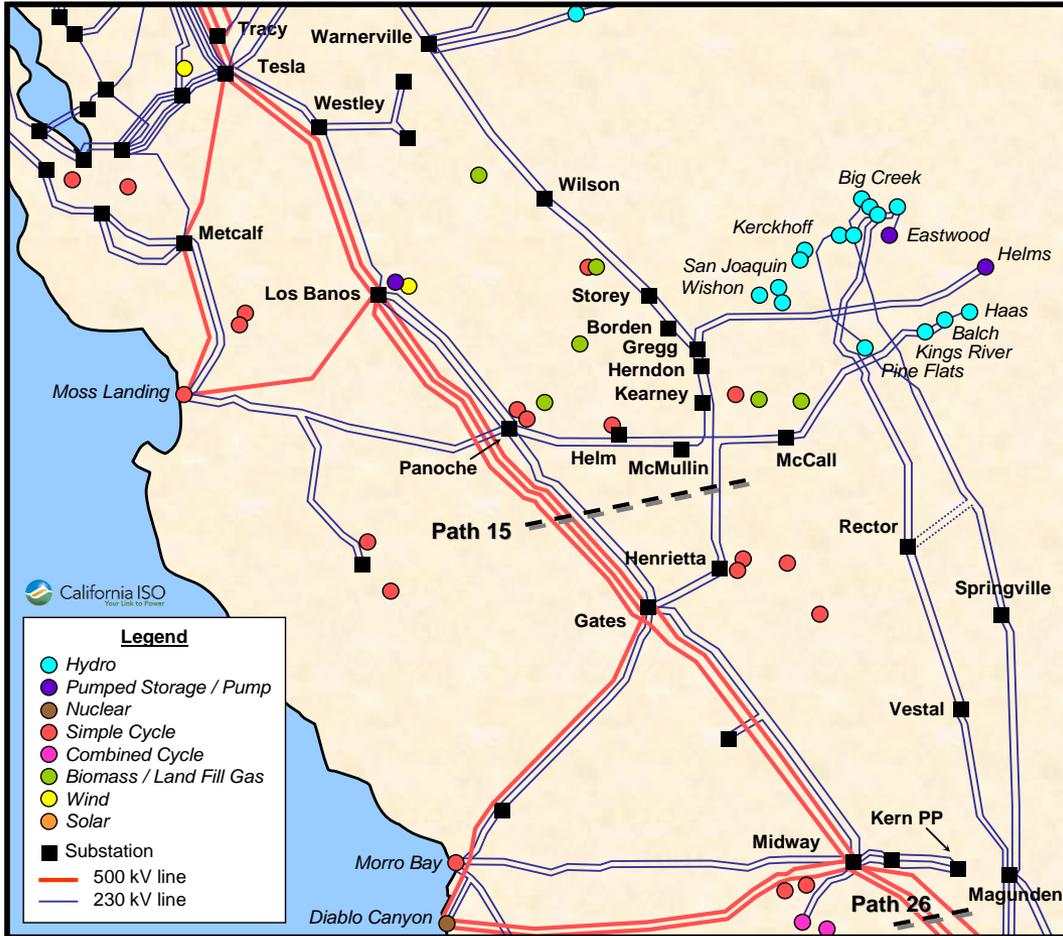
Study Information

- Final Study Plan will be published after the approved California ISO 2011/2012 plan is released
- Base cases will be posted on the Market Participant Portal (MPP)
 - For reliability assessment in Q2
 - For 33% renewable energy assessment in Q3
- Market notices will be sent to notify stakeholders of meeting and any relevant information
- Stakeholder comments
 - Stakeholders requested to submit comments to:
regionaltransmission@caiso.com
 - Stakeholder comments are to be submitted within two weeks after stakeholder meetings
 - ISO will post comments and responses on website

Central California Study

- In addition to the studies identified in the 2012/2013 Study Plan, the ISO will be developing an individual study plan for the Central California as identified in the 2011/2012 Draft Transmission Plan.
- The Central California Study Plan will be included as an addendum to the 2012/2013 Study Plan.
- The ISO will provide stakeholders with an opportunity to provide comment on the Central California Study Plan.
- The ISO will be developing the study plan in Q2-2012 and will provide market notice to stakeholders.

Central California Study (continued)



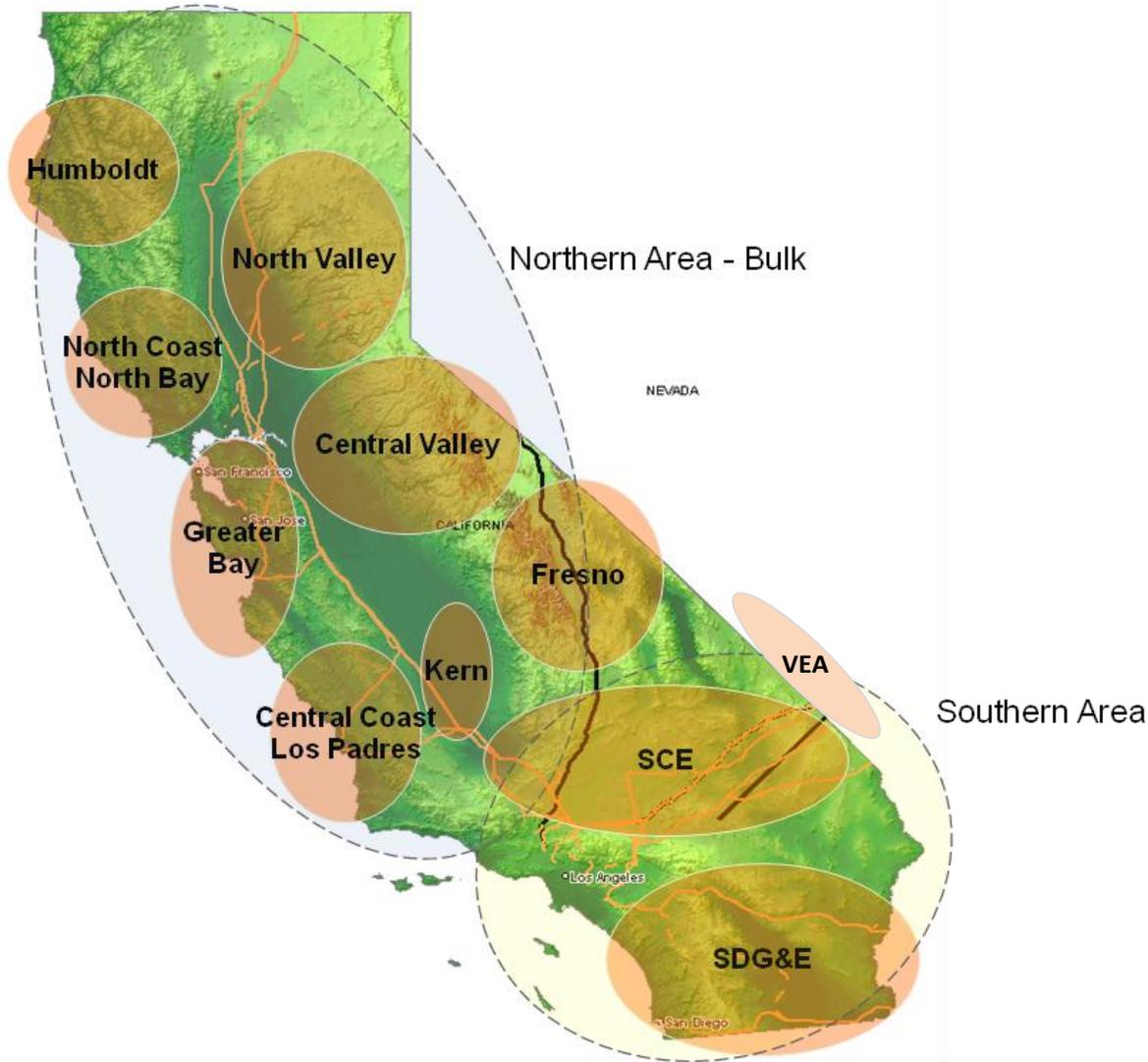
- Potential needs within the Central California bulk system are multi-faceted.
- Wide variety of potential benefits associated with modifications to the bulk system in the area.
- Potential benefits of the project may be either one of or a combination of the following.
 - Reliability;
 - Economic;
 - Policy; and/or
 - Renewable integration.
- Assessment will consider the generation portfolios that will be used for the 2012/2013 transmission planning and will include:
 - a comprehensive analysis associated with renewable integration
 - consideration of operational flexibility of the Helms pumps

Reliability Assessment Assumptions and Methodologies

Planning Assumptions

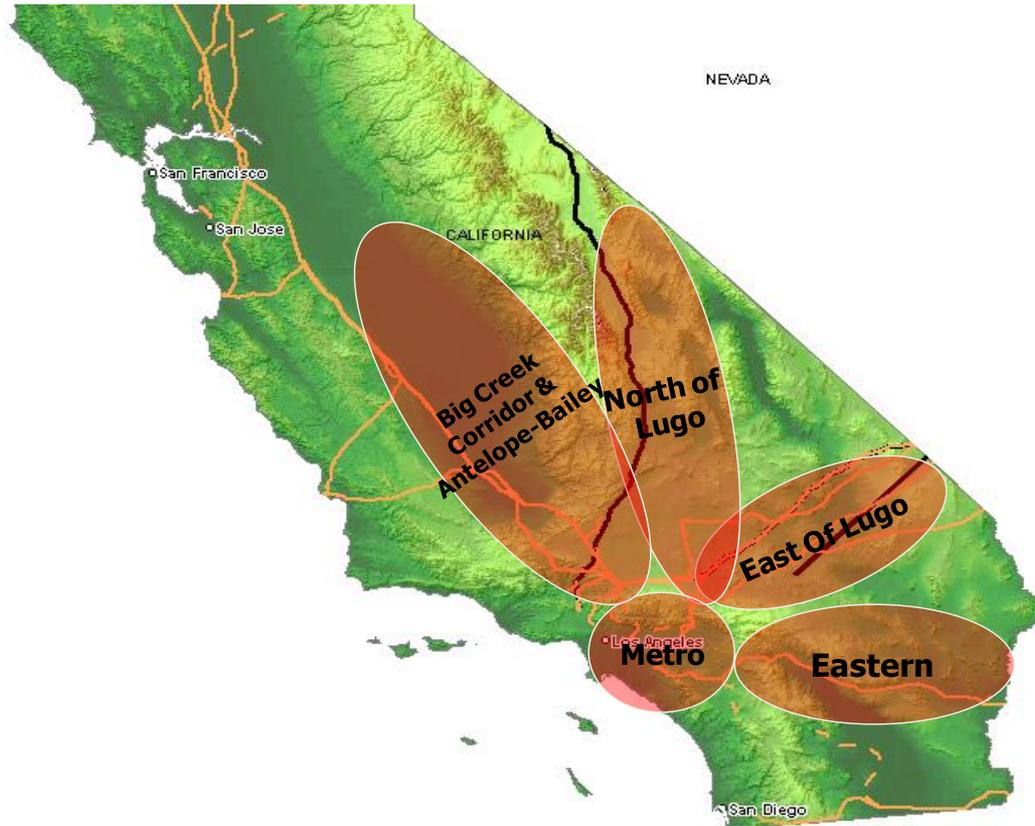
- Reliability Standards and Criteria
 - California ISO Planning Standards
 - NERC Reliability Criteria
 - TPL-001
 - TPL-002
 - TPL-003
 - TPL-004
 - WECC Regional Criteria
- Study Horizon
 - 10 years planning horizon
 - near-term (2013-2017); and
 - long-term (2018-2022)

Study Areas



- **Northern Area - Bulk**
- **PG&E Local Areas:**
 - Humboldt area
 - North Coast and North Bay area
 - North Valley area
 - Central Valley area
 - Greater Bay area:
 - San Joaquin Valley area
 - Central Coast and Los Padres areas.
- **Consolidated Southern Area**
- **SDG&E area**
- **Valley Electric Association area**

Study Areas (Continued)



- **SCE local areas:**
 - Metro area
 - Big Creek Corridor
 - Antelope-Bailey area
 - North of Lugo area
 - East of Lugo area; and
 - Eastern area

Base Case Assumptions

- WECC base cases will be used as the starting point to represent the rest of WECC
- Transmission Assumptions
 - ISO-approved transmission projects
 - Transmission upgrades to interconnect new modeled generation

Study Scenarios for Planning Areas

- Peak loads are studied in individual areas
 - Summer Peak
 - Winter Peak (in specific areas)
- Off-Peak loads are studied in individual areas
- North bulk system and consolidated Southern California area studies include summer peak loads and off-peak studies for 2017 and summer peak study for 2022

Study Scenarios

Study Area	2013 through 2017	2022
Northern California (PG&E) Bulk System*	Summer Peak Summer Off-Peak	Summer Peak Summer Off-Peak
Humboldt	Summer Peak Summer Off-Peak Winter Peak	Summer Peak Winter Peak
North Coast and North Bay	Summer Peak Summer Off-Peak Winter peak	Summer Peak Winter peak
North Valley	Summer Peak Spring Off-Peak	Summer Peak
Central Valley (Sacramento, Sierra, Stockton)	Summer Peak Spring Off-Peak	Summer Peak
Greater Bay Area	Summer Peak Summer Off-Peak Winter peak	Summer Peak Winter peak
San Joaquin Valley (Yosemite, Fresno, Kern)	Summer Peak Summer Off-Peak	Summer Peak
Central Coast & Los Padres	Summer Peak Winter Peak Summer Off-Peak	Summer Peak Winter Peak
Consolidated Southern California	Summer Peak Summer Off-Peak	Summer Peak
Southern California Edison (SCE) area	Summer Peak Summer Off-Peak	Summer Peak Summer Off-Peak
San Diego Gas and Electric (SDG&E) area	Summer Peak Summer Off-Peak	Summer Peak Summer Off-Peak
Valley Electric Association	Summer Peak Summer Off-Peak	Summer Peak

Major Path Flows

Northern area (PG&E system) assessment

Path	Path Flow (MW)			
	Summer Peak	Summer Off-Peak	Winter Peak	Spring Off-peak
Path 15 (S-N)	N/A	5400	1000	TBD
Path 26 (N-S)	4000	1500	2800	800
Path 66 (N-S)	4800	3700	3800	1500

Southern area (SCE & SDG&E system) assessment

Paths	Flow Range (MW)
Path 26 (N-S)	-3000 to 4,000
PDCI	900 to 3,100
West of River	5,000 to 9,700
East of River	3,900 to 6,000
Path 42	150 to 1000
Path 61	550 to 1900
South of San Onofre	628 to 801
ISO - Mexico (CFE)	-5 to 5
IID-SDGE	-25 to 676

Load Forecast

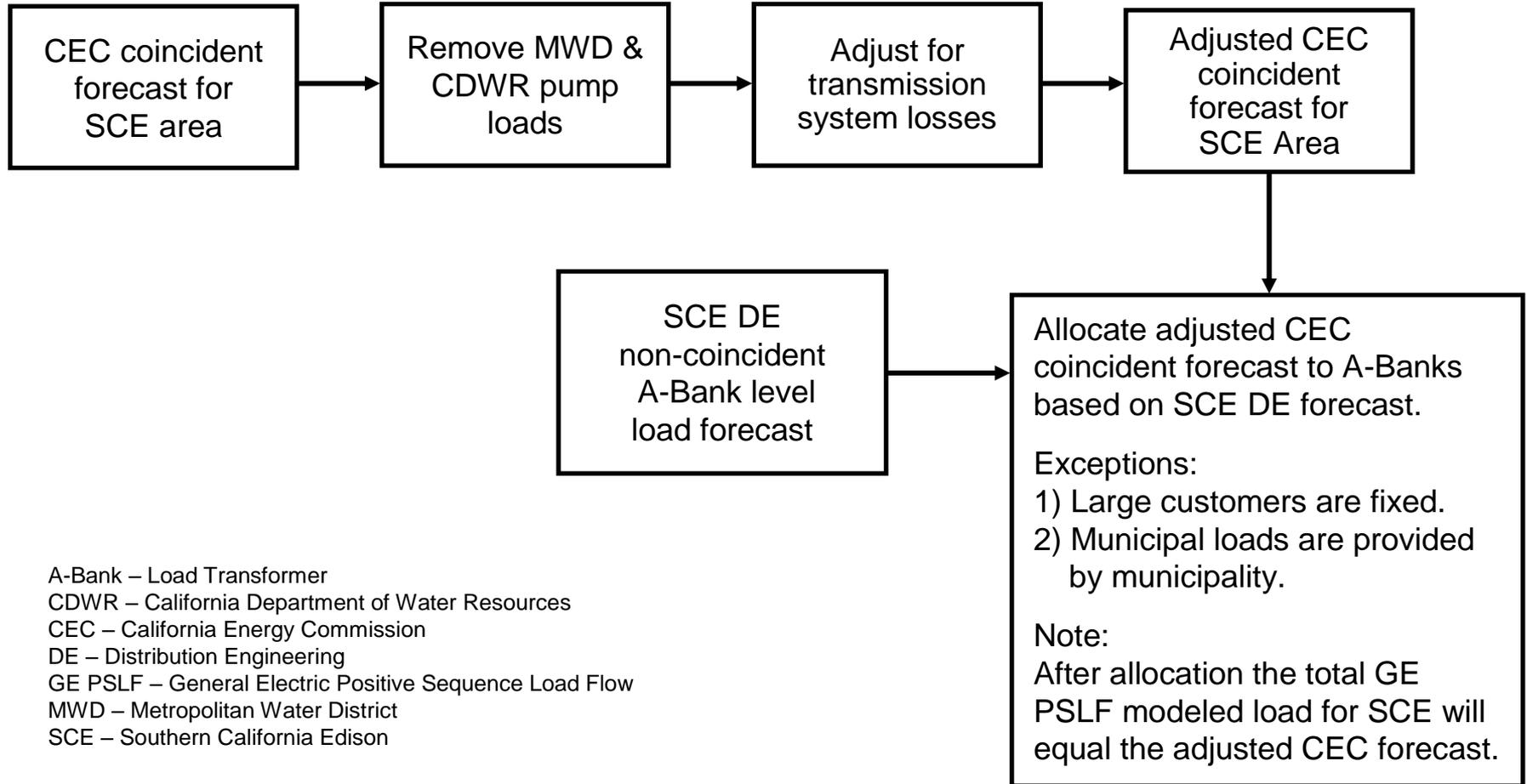
- CEC Load forecast will be used as the starting point
 - For the assessment it is proposed that the preliminary mid-case California Energy Demand Forecast 2012-2022 released by California Energy Commission (CEC) on August 30, 2011 be utilized.
http://www.energy.ca.gov/2011_energy_policy/documents/index.html#08302011
- Methodologies used by PTOs to create bus-level load forecast were documented in the draft Study Plan
- 1-in-10 year heat wave load projection for individual local area studies
- 1-in-5 year heat wave load projection for Northern and consolidated Southern California bulk system studies

Load Forecast Methodology

PG&E

- PG&E creates bus-level load forecast (using CEC forecast as the starting point)
 - PG&E loads in the base case
 - Determination of Division Loads
 - Allocation of Division Load to Transmission Bus Level
 - Muni Loads in Base Case

Load Forecast Methodology SCE



A-Bank – Load Transformer
CDWR – California Department of Water Resources
CEC – California Energy Commission
DE – Distribution Engineering
GE PSLF – General Electric Positive Sequence Load Flow
MWD – Metropolitan Water District
SCE – Southern California Edison

Load Forecast Methodology

SDG&E

- Utilize CEC's latest load forecast as the starting point
- SDGE's methodology to create bus-level load forecast
 - Actual peak loads on low side of each substation bank transformer
 - Normalizing factors applied for achieving weather normalized peak
 - Adversing factor applied to get the adverse peak

Generation Assumptions

- One-year operating cases
- 2-5-year planning cases
 - CPUC's discounted core and ISO's interconnection agreement status will be utilized as criteria for modeling specific renewable generation
- 6-10-year planning cases
 - Renewable generation included in the 2011-2012 baseline scenario
- Retired generation is modeled in appropriate study areas

New Thermal Generation

No	Project	Capacity (MW)	First Year to be Modeled	PTO Area
3	Lodi Energy Center (Construction)	255	2013	PG&E
4	Tracy Combined Cycle (Construction)	145	2013	PG&E
5	Mariposa Peaker (Construction)	196	2013	PG&E
6	Marsh Landing (Construction)	774*	2013	PG&E
7	Walnut Creek Peaker (Construction)	500	2013	SCE
8	Los Esteros Combined Cycle (Construction)	120	2014	PG&E
9	Russel City – East Shore EC (Construction)	600	2013	PG&E
10	Oakley Generation Station (Construction)	624	2014	PG&E
11	El Segundo Power Redevelopment (Construction)	570	2014	SCE
12	Sentinel Peaker (Construction)	850	2014	SCE
13	Genesis Solar Energy Project (Construction)	250	2014	SCE
14	Ivanpah Solar (Construction)	370	2013-2014	SCE
16	Henrietta PP CC Expansion (Pre-Construction)	25	2013	PG&E
18	Avenal (Pre-Construction)	600	2014	PG&E
23	Palmdale Power Plant (Pre-Construction)	570	2015	SCE

Generation Retirements

No	Project	Capacity (MW)	First Year to be retired	PTO Area
1	Huntington Beach 3	220	2012	SCE
2	Huntington Beach 4	220	2012	SCE
3	Contra Costa 6	337	2013*	PG&E
4	Contra Costa 7	337	2013*	PG&E
5	Kearny Peakers	135	2014	SDG&E
6	Miramar GT1 and GT2	36	2014	SDG&E
7	El Cajon GT	16	2014	SDG&E

Study Methodology

- The planning assessment will consist of:
 - Power Flow Contingency Analysis
 - Post Transient Analysis
 - Post Transient Stability Analysis
 - Post Transient Voltage Deviation Analysis
 - Voltage Stability and Reactive Power Margin Analysis
 - Transient Stability Analysis

Contingency Analysis

- **Normal conditions (TPL-001)**
- **Loss of a single bulk electric system element (BES) (TPL-002 - Category B)**
 - The assessment will consider all possible Category B contingencies based upon the following:
 - Loss of one generator (B1)
 - Loss of one transformer (B2)
 - Loss of one transmission line (B3)
 - Loss of a single pole of DC lines (B4)
 - Loss of the selected one generator and one transmission line (G-1/L-1) , where G-1 represents the most critical generating outage for the evaluated area
 - Loss of a both poles of a Pacific DC Intertie
- **Loss of two or more BES elements (TPL-003 - Category C)**
 - The assessment will consider the Category C contingencies with the loss of two or more BES elements which produce the more severe system results or impacts based on the following:
 - Breaker and bus section outages (C1 and C2)
 - Combination of two element outages with system adjustment after the first outage (C-3)
 - All double circuit tower line outages (C5)
 - Stuck breaker with a Category B outage (C6 thru C9)
 - Loss of two adjacent transmission circuits on separate towers

Contingency Analysis (continued)

- **Extreme contingencies (TPL-004 - Category D)**
 - The assessment will consider the Category D contingencies of extreme events which produce the more severe system results or impact as a minimum based on the following:
 - Loss of 2 nuclear units
 - Loss of all generating units at a station.
 - Loss of all transmission lines on a common right-of-way
 - Loss of substation (One voltage level plus transformers)
 - Certain combinations of one element out followed by double circuit tower line outages.
 - More category D conditions may be considered for the study

Corrective Action Plans

- The technical studies mentioned in this section will be used for identifying mitigation plans for addressing reliability concerns.
- As per ISO tariff, identify the need for any transmission additions or upgrades required to ensure System reliability consistent with all Applicable Reliability Criteria and CAISO Planning Standards.
 - In making this determination, the ISO, in coordination with each Participating TO with a PTO Service Territory and other Market Participants, shall consider lower cost alternatives to the construction of transmission additions or upgrades, such as:
 - acceleration or expansion of existing projects,
 - demand-side management,
 - special protection systems,
 - generation curtailment,
 - interruptible loads,
 - storage facilities; or
 - reactive support

Special Protection System (SPS) Review

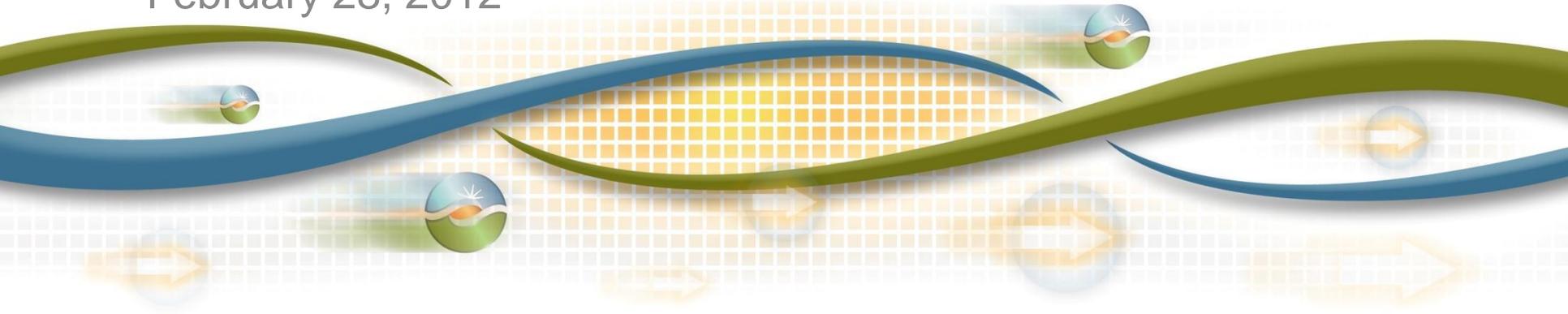
- The ISO will be reviewing performance, operation and design of the existing SPS on the system.
- As a part of developing the corrective action plans to address the reliability performance issue identified in the studies, the ISO will assess if new SPS are appropriate and will bring forward projects as needed if we see concerns that warrant it.



Unified Planning Assumptions & Study Plan *2012/2013 ISO 33% RPS*

2012/2013 Transmission Plan Stakeholder Meeting

Yi Zhang
Senior Regional Transmission Engineer
February 28, 2012



Overview of the 33% RPS Transmission Assessment in 2012/2013 Planning Cycle

- Objective
 - Identify the transmission upgrades needed to meet the 33% renewable resource goal
- Portfolios
 - CPUC portfolios (currently under development)
- Methodology
 - Power flow and stability assessments
 - Production cost simulations
 - Deliverability assessments

Portfolios

- The preliminary portfolios are currently under development by CPUC, CEC, and ISO
- Preliminary portfolios will be shared with stakeholders in March and discussed in a stakeholder meeting
- In accordance with tariff Section 24.4.6.6, the renewable portfolios will reflect considerations, including but not limited to, environmental impact, commercial interest, risk of stranded investment, and comparative cost of transmission alternatives

Methodology – Production Simulation

- Conduct production simulation for each of the developed portfolios using the ISO unified economic assessment database
- The production simulation results are used to inform the development of power flow scenarios for the power flow and stability assessments

Methodology –Power Flow and Stability Assessments

- Power flow contingency analysis
- Voltage stability assessment (Voltage deviation, Reactive Power Margin, PV/QV analysis)
- Transient stability (Voltage deviation, Frequency deviation, stability)

Methodology – Deliverability Assessment

- Follow the same methodology as used in GIP
- Deliverability for the base portfolio and sensitivity portfolios as needed

Modeling Portfolios

- Start from reliability peak and off-peak basecases for 2022
- Modeling CPUC's portfolios in transmission planning power flow and production cost models
- Representative GIP study data used if an equivalent resource could be matched; otherwise generic model and data will be used

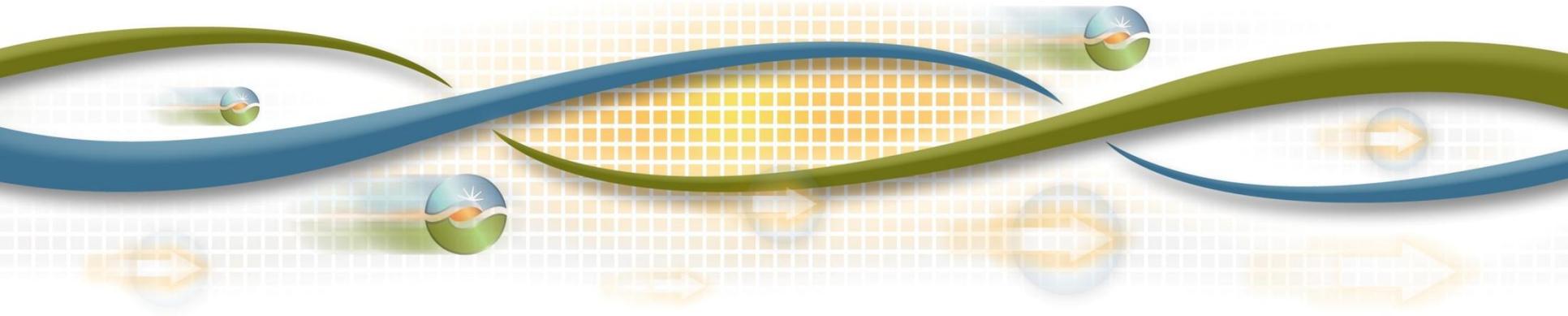
Q & A



Unified Planning Assumptions & Study Plan *2012/2013 ISO LCR Studies*

2012/2013 ISO Transmission Plan Stakeholder Meeting

Catalin Micsa
Lead Regional Transmission Engineer
February 28, 2012



Scope plus Input Assumptions, Methodology and Criteria

The scope of the LCR studies is to reflect the minimum resource capacity needed in transmission constrained areas in order to meet the established criteria.

Used for one year out RA compliance, as well as long-term look in order to guide LSE procurement.

For latest study assumptions, methodology and criteria see the November 10, 2011 stakeholder meeting. This information along with the 2013 LCR Manual can be found at:

http://www.caiso.com/Documents/LCR_ManualFinal_2013.pdf.

General LCR Transparency

- Base Case Disclosure
 - ISO has published the 2013 LCR base cases and will publish the 2017 LCR base cases on the ISO protected web site
(<https://portal.caiso.com/tp/Pages/default.aspx>)
 - Remember to execute WECC/ISO non-disclosure agreements
(<http://www.caiso.com/1f42/1f42d6e628ce0.html>)
- Publication of Study Manual (Plan)
 - Provides clarity and allows for study verification
(http://www.caiso.com/Documents/LCR_ManualFinal_2013.pdf)
- ISO to respond in writing to questions raised (also in writing) during stakeholder process
(<http://www.caiso.com/informed/Pages/StakeholderProcesses/LocalityCapacityRequirementsProcess.aspx>)

Summary of LCR Assumptions

- Transmission and generation modeled if on-line before June 1 for applicable year of study (January 1 for Humboldt – winter peaking)
- Use the latest CEC 1-in-10 peak load in defined load pockets
- Maximize import capability into local areas
- Maintain established path flow limits
- Units under long-term contract turned on first
- Maintain deliverability of generation and imports
- Fixed load pocket boundary
- Maintain the system into a safe operating range
- Performance criteria includes normal, single as well as double contingency conditions in order to establish the LCR requirements in a local area
- Any relevant contingency can be used if it results in a local constraint
- System adjustment applied (up to a specified limit) between two single contingencies

LCR Criteria

- The LCR study is a planning function that currently forecasts local operational needs one year in advance
- The LCR study relies on both:
 - ISO/NERC/WECC Planning Standards
 - WECC Operating Reliability Criteria (ORC)
- Applicable Ratings Incorporate:
 - ISO/NERC/WECC Planning Standards – Thermal Rating
 - WECC ORC – Path Rating

2013 LCR Study Schedule

CPUC and the ISO have determined overall timeline

- Criteria, methodology and assumptions meeting Nov. 10, 2011
- Submit comments by November 24, 2011
- Posting of comments with ISO response by the January 18, 2012
- Base case development started in December 2011
- Receive base cases from PTOs January 3, 2012
- Publish base cases January 17, 2012 – comments by the 31th
- Draft study completed by March 5, 2012
- ISO Stakeholder meeting March 8, 2012
- ISO receives new operating procedures March 22, 2012
- Review and validate op. proc. – publish draft final report April 5, 2012
- ISO Stakeholder meeting April 12, 2012 – comments by the 19th
- Final report May 1, 2012



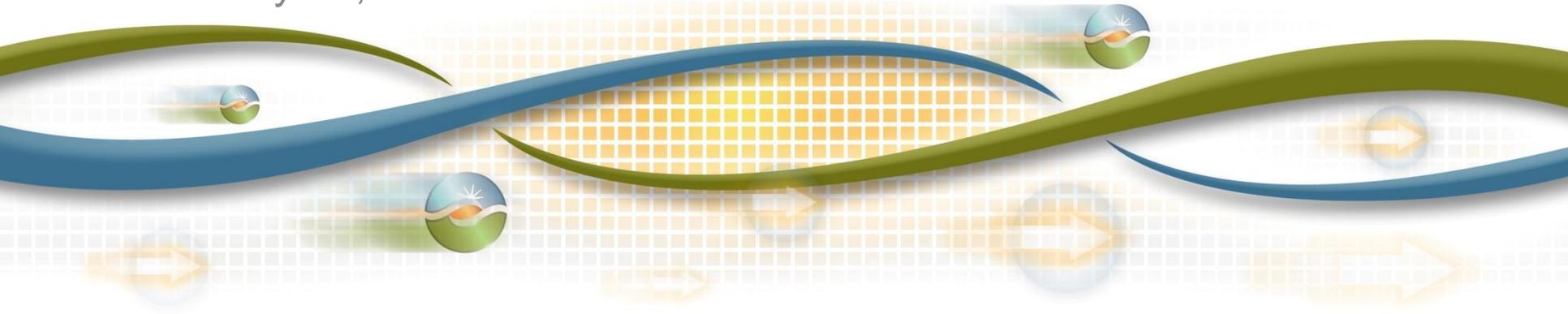


Unified Planning Assumptions & Study Plan

Economic Planning Studies

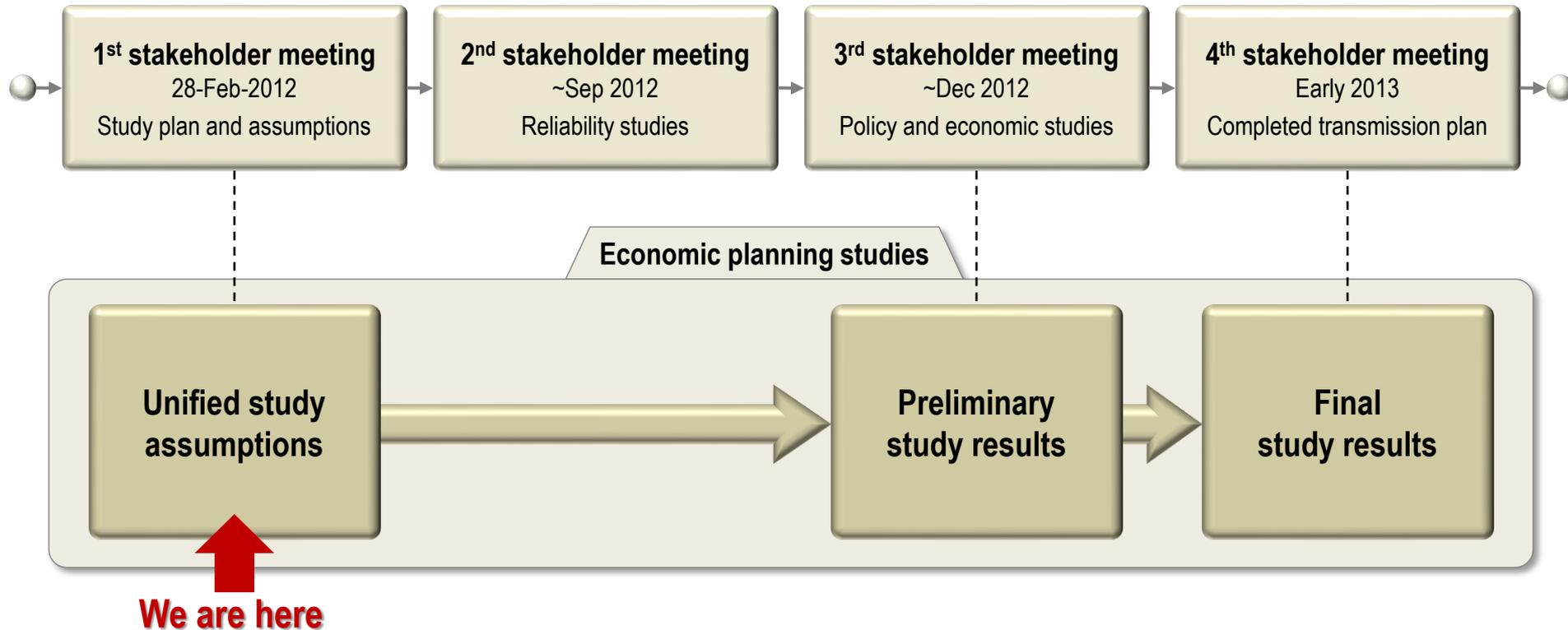
2012/2013 ISO Transmission Plan Stakeholder Meeting

Xiaobo Wang, PhD
Regional Transmission Engineering Lead
February 28, 2012



Economic Planning Studies in the ISO Transmission Plan Stakeholder Process

ISO 2012/2013 Transmission Plan – Stakeholder Process



Economic planning studies are also known as “regulatory studies”, “strategic planning” and “congestion analysis”

Study Assumptions and Schedule

Economic Planning Studies

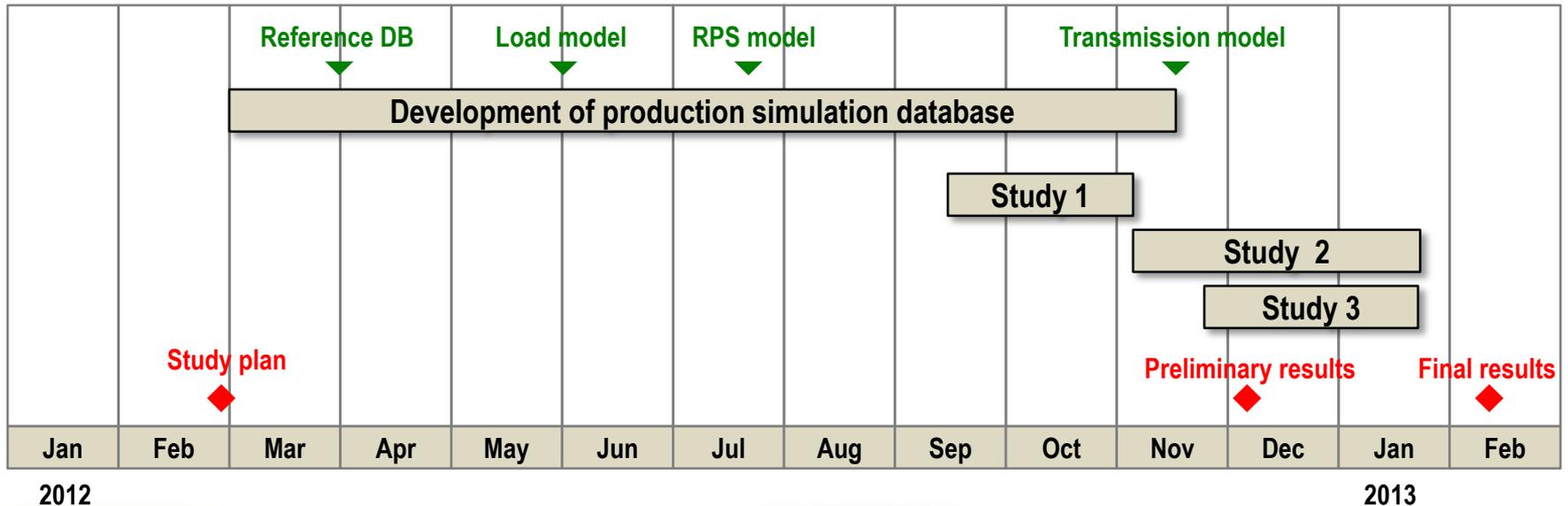
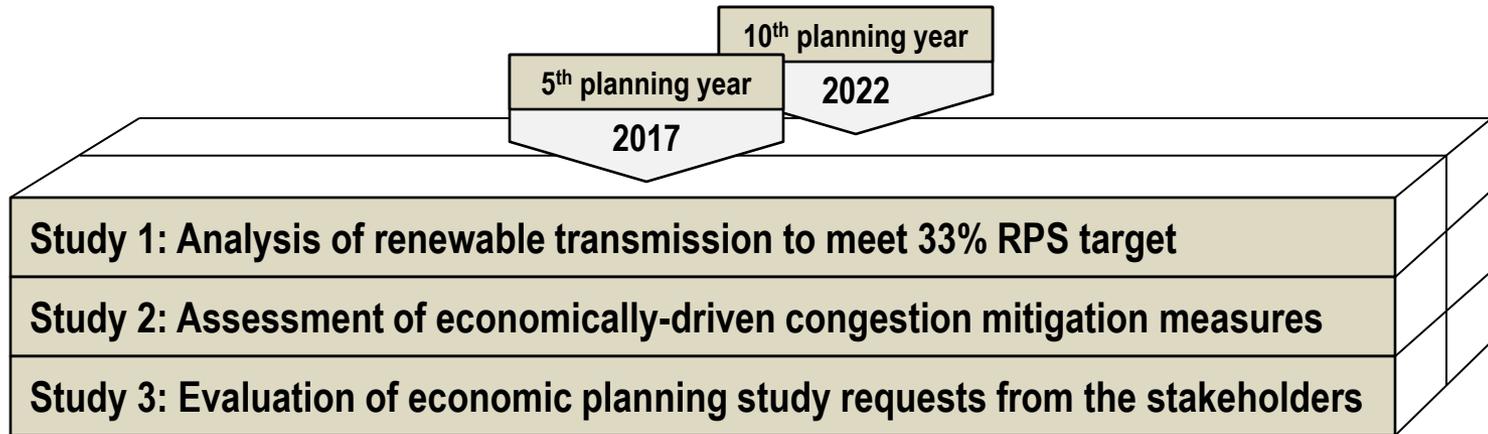
Data input

	Approximate development period	Expected completion time
CEC 2011 Demand Forecast	From Jan 2010 to Feb 2012	Feb ~ Mar 2012
CPUC 2011 LTPP RPS net short portfolios	From Jan to May 2012	Apr ~ May 2012
CAISO 2012/2013 transmission assumptions	From Mar to Oct 2012	Oct ~ Dec 2012

Database platform

	Approximate development period	Expected completion time
WECC TEPPC 2022 Common Case	Jan 2011 to Feb 2012	Feb ~ Mar 2012
CAISO production simulation database	Mar to Oct 2012	Oct ~ Nov 2012

Study Scope and Schedule Economic Planning Studies

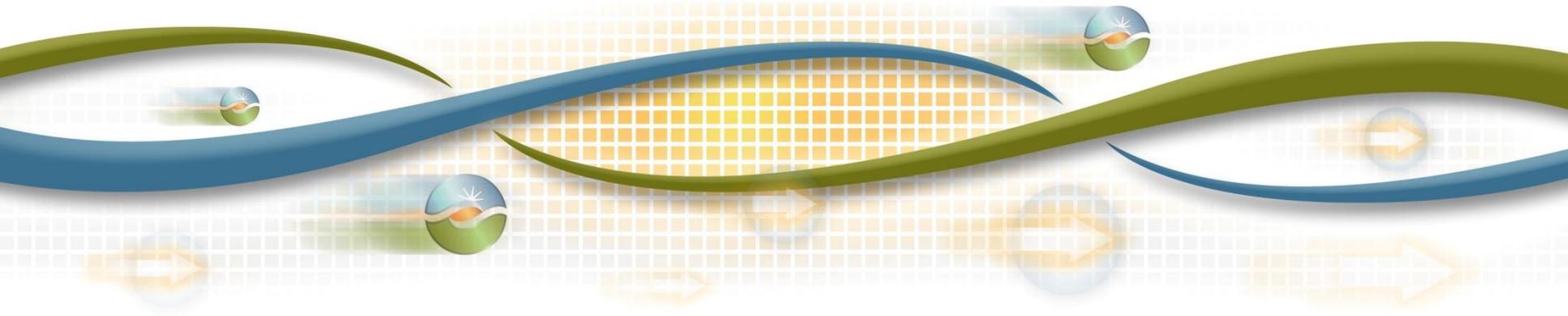




Unified Planning Assumptions & Study Plan *Once Through Cooling/AB1318 Studies*

2012/2013 ISO Transmission Plan Stakeholder Meeting

David Le
Senior Advisor – Regional Transmission South
February 28, 2012



Overview

- Recap of 2011/2012 studies
- Proposed studies for 2012/2013 transmission planning process

ISO LCR Areas and Locations of OTC Plants



Recap of 2011/2012 OTC/AB 1318 Studies

	Study Scope	Status
1	Evaluated long-term (2021) local capacity requirements and the need for generation at existing OTC sites for four RPS portfolios	Completed
2	Sensitivity assessments with mid net load assumptions (i.e., incremental energy efficiency) for ISO's LA Basin LCR area per request from the state energy agencies	Completed (further <u>sensitivity</u> studies on incremental CHP to be performed in 2012/2013 TPP)
3	Zonal and system loads and resources assessments	Completed
4	Update Loads and Resources Tool for LCR areas	- Completed (based on previous study assumptions) - In process of further refinement to include 2011/2012 TPP study results

- Study results were posted on ISO website (<http://www.caiso.com/planning/Pages/TransmissionPlanning/2011-2012TransmissionPlanningProcess.aspx>)

Proposed Studies for 2012/2013 Transmission Planning Process

	Study Scope	Potential Data Input Updates
1	Continues to provide support to California Air Resources Board to complete AB 1318 Report	<input type="checkbox"/> Utilizes 2021 OTC study results
2	Refines selected 2011/2012 OTC studies (2021) as necessary based on new available updates (assumptions based on timely available updates)	<input type="checkbox"/> New CEC-adopted demand forecast <input type="checkbox"/> CPUC's updated RPS assumptions <input type="checkbox"/> Updated generator-submitted implementation plans
3	Performs long-term reliability assessment for the absence of SONGS and Diablo Canyon nuclear power plants	<input type="checkbox"/> Built upon OTC study results performed for 2011/2012 TPP
4	Completes updates for the L&R Tool (for LCR areas)	<input type="checkbox"/> Incorporates long-term (2021) OTC study results and latest intermediate or short-term LCR study results
5	Provides support to CPUC 2012 LTPP for LA Basin generation requirements as needed	<input type="checkbox"/> Provides evidences from 2021 OTC studies
6	Provides updates to ISO BAA and zonal area loads and resources analyses (long-term ISO summer assessment)	<input type="checkbox"/> See list for item 1

Back-up Documents

List of ISO OTC Generating Units and Locations

Area	Generating Facility (Total Plant MW)	Owner	Unit	SWRCB Compliance Date	Generation Owners' Proposed Compliance Date	Existing NQC Capacity (MW)	Final Capacity, if Already Repowered or Under Construction (MW)
Humboldt LCR Area	Humboldt Bay (163 MW non-OTC)	PG&E	1	12/31/2010	In compliance July 2010	Former 105 MW facility was repowered with 10 CTs	Repowered / Compliant with Policy on OTC Plants (163 MW)
			2	12/31/2010	In compliance July 2010		
Greater Bay Area LCR	Contra Costa (674 MW)	GenOn	6	12/31/2017	4/30/2013	337	To be replaced by Marsh Landing power plant (760 MW) – under construction (current OD – 6/13)
			7	12/31/2017		337	
	Pittsburg (1,311 MW**) **Unit 7 is non-OTC	GenOn	5	12/31/2017	12/31/2017 but may take longer	312	If GenOn receives long-term PPA, it can utilize cooling tower of Unit 7 for Units 5 & 6 to comply with OTC Policy
			6	12/31/2017		317	
Potrero (Retired)	GenOn	3	10/1/2011	In compliance 2/28/2011	206	Retired	
Central Coast (non-LCR area)	Moss Landing (2,530 MW)	Dynegy	1	12/31/2017	12/31/2032	510	These two OTC combined cycle plants were placed in service in 2002
			2	12/31/2017		510	
			6	12/31/2017	12/31/2017	754	
			7	12/31/2017		756	
*Non-LCR area has no local capacity requirements	Morro Bay (650 MW)	Dynegy	3	12/31/2015	12/31/2015	325	May attempt to repower with two 50 MW, one 100MW or one 164 MW
			4	12/31/2015	12/31/2015	325	
	Diablo Canyon (2,240 MW)	PG&E	1	12/31/2024	12/31/2024	1122	Consultants to PG&E and SCE (and Water Board) to evaluate alternatives of cooling system
			2	12/31/2024	12/31/2024	1118	
Big Creek-Ventura LCR Area	Mandalay (430 OTC plus 130 MW non-OTC)	GenOn	1	12/31/2020	12/31/2020	215	Mandalay has 3 units (two are OTC and one is non-OTC)
			2	12/31/2020		215	
	Ormond Beach (1,516 MW)	GenOn	1	12/31/2020	12/31/2020	741	Slide 7
			2	12/31/2020		775	

List of ISO OTC Generating Units and Locations (cont'd)

Area	Generating Facility (Total Plant MW)	Owner	Unit	SWRCB Compliance Date	Generation Owners' Proposed Compliance Date	Existing NQC Capacity (MW)	Final Capacity, if Already (or To Be) Repowered (MW)
Los Angeles (LA) Basin LCR Area	El Segundo (670 MW)	NRG	3	12/31/2015	8/1/2013	335	Unit 3 to be repowered with 560 MW; under construction (current OD – 8/13)
			4	12/31/2015	12/31/2017	335	
	Alamitos (2,011 MW)	AES	1	12/31/2020	2022	175	AES plans to repower, although firm plans (i.e., which ones will definitely move forward to construction) are not available at this time
			2	12/31/2020		175	
			3	12/31/2020	2024	332	
			4	12/31/2020		336	
			5	12/31/2020	12/31/2020	498	
			6	12/31/2020		495	
	Huntington Beach (452 MW)	AES	1	12/31/2020	2022	226	Units 3 & 4 are replaced by Edison Mission Energy's 500 MW Walnut Creek Energy Project (currently under construction)
			2	12/31/2020		226	
			3	12/31/2020	Sale to EME means retirement in 2012	225 (Retired)	
			4	12/31/2020		227 (Retired)	
	Redondo Beach (1,343 MW)	AES	5	12/31/2020	2022	179	
			6	12/31/2020		175	
			7	12/31/2020	2018	493	
			8	12/31/2020		496	
	San Onofre (2,246 MW)	SCE/SDG&E	2	12/31/2022	12/31/2022	1122	Consultants to PG&E, SCE (and Water Board) to evaluate alternatives of cooling system for SONGS
3	12/31/2022	1124					
San Diego/I.V. LCR Area	Encina (946 MW)	NRG	1	12/31/2017	prior to 12/31/2017	106	NRG currently seeks CEC approval on a proposed new 558 MW project (Carlsbad Energy Center)
			2	12/31/2017		103	
			3	12/31/2017		109	
			4	12/31/2017	12/31/2017	299	
			5	12/31/2017		329	
	South Bay	Dynegy	1-4	12/31/2011	Retired 12/31/2010	692	Retired