

CALIFORNIA  
TRANSMISSION  
PLANNING  
GROUP



# CTPG Stakeholder Meeting Draft Statewide Transmission Plan

January 20, 2012

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TRANSMISSION  
PLANNING  
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# MEETING WELCOME – MO BESHIR

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# MEETING AGENDA – MO BESHIR

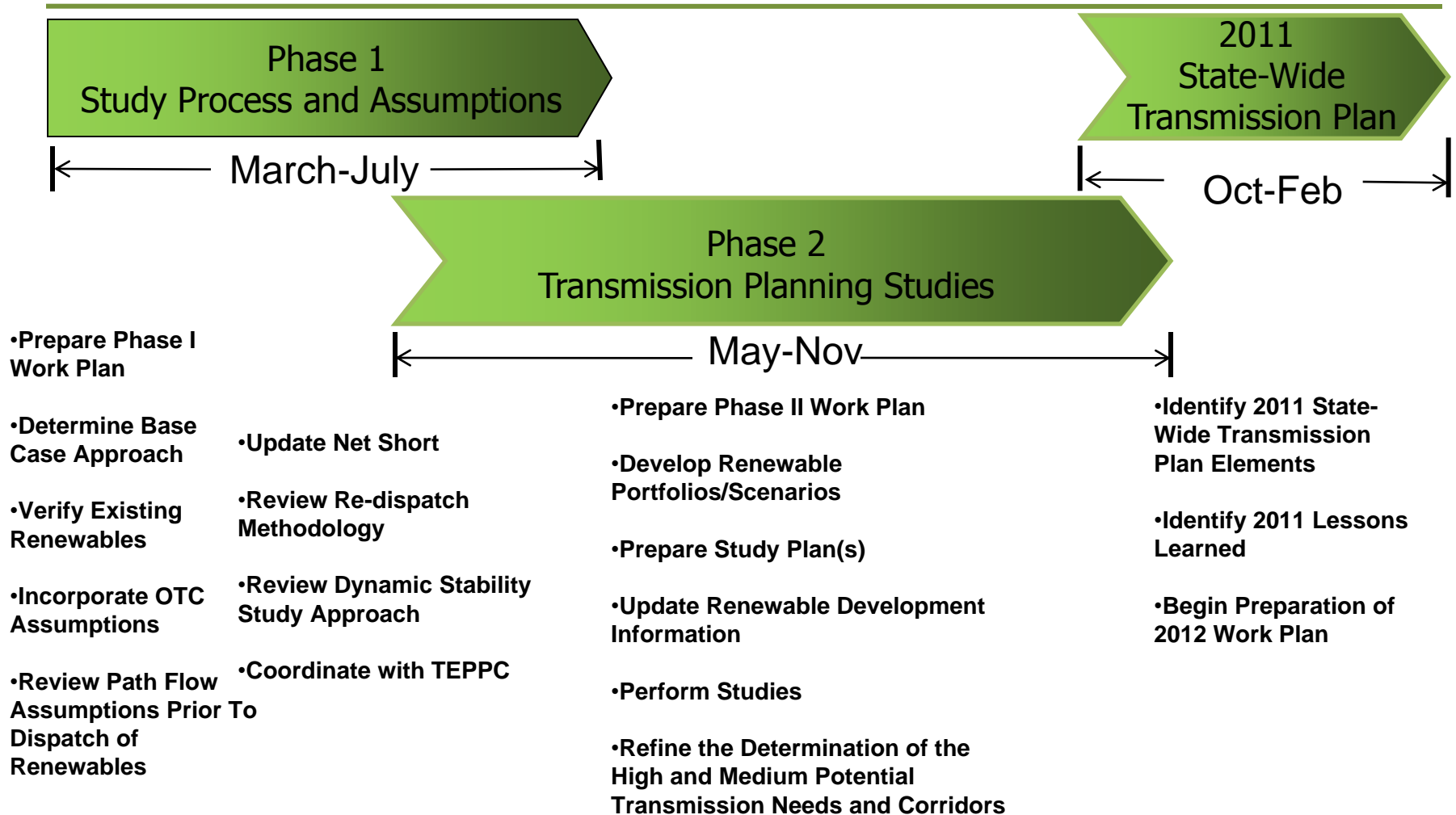
# AGENDA

Meeting Welcome	9:30 – 9:35	Mo Beshir
Meeting Agenda	9:35 – 9:40	Mo Beshir
2011 CTPG Work Plan	9:40 – 9:45	Mo Beshir
Phase I Study Process and Assumptions	9:45 – 9:55	Jan Strack
Phase II, Study Results	9:55 – 10:05	Ben Morris
Phase III, Statewide Transmission Plan		
✓ High Ranked CREZs	10:05 – 10:10	Jan Strack
✓ High and Medium Potential Transmission Upgrades	10:10 – 10:15	Jan Strack
✓ High Potential Transmission Corridors	10:15 – 10:20	Jan Strack
Stakeholder Input	10:20 – 11:55	Jan Strack
Meeting Wrap-Up and Next Steps	11:55 – 12:00	Mo Beshir
Adjourn	12:00	

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# CTPG 2011 WORK PLAN – MO BESHIR

# CTPG 2011 Work Plan



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# **CTPG PHASE I: STUDY PROCESS AND ASSUMPTIONS – JAN STRACK**

# Phase I Process and Assumptions

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- Verified Modeling of Existing Renewables.
- Developed Once Through Cooling Assumptions
- Identified Location Constrained Resources
- Identified Planned Transmission and Fossil Fuel Plant Additions
- Updated Net Short
- Updated Load Forecast
- Developed Fossil Fuel Decrementing Assumptions
- Reviewed CPUC/POU Discounted Core



# Scenarios

No.	Scenario Name	Description	Season Date Time	Path Flow Prior to Addition of New Renewables	Renewable Resource Portfolio
1	Pacific Northwest Import	Wind imports from combined with hydro runoff.	spring (5 PM PST in early June)	stress COI (n-s)	POU-CPUC Discounted Core + PNW +RETI Best CREZs
2				foundation	
3	Northwest Nevada Import	Geothermal from & wind and solar from .	summer peak (4 PM PST in July)	stress COI (n-s)	POU-CPUC Discounted Core + Northwest NV +RETI Best CREZs
4				foundation	
5	South to North Flow	Light loads with significant wind and morning solar generation. Path 15 and 26 flows are south to north.	fall (9 AM PST in late September)	foundation	POU-CPUC Discounted Core +RETI Best CREZs
6	CPUC Public Policy	Updated CPUC cost-constrained renewable portfolio including all POU-CPUC Discounted Core resources; 1384 MW of renewable DG; 26% of non-California renewables.	summer peak (4 PM PST in July)	foundation	CTPG version of CPUC Public Policy
7	Central California	Large renewable projects on disturbed lands with relatively few environmental issues interconnecting at Panoche, Gates and Midway substations.	summer peak (4 PM PST in July)	foundation	POU-CPUC Discounted Core + 5000 MW from central CA interconnection queue +RETI Best CREZs
8	West of River Import	High wind and solar imported from , , and via the WOR path at Eldorado (50%), Palo Verde (37%) and North Gila (13%).	fall (9 AM PST in late September)	foundation with emphasis on WOR (e-w)	POU-CPUC Discounted Core + WY, UT, NV & AZ +RETI Best CREZs
9		Scenario 8 with renewable injections at Eldorado (37%), Palo Verde (50%) and North Gila (13%).			

# Study Methodology

## Develop Pre-renewable Study Cases

*Starting from WECC Seed Cases:*

- *Adjust California Loads to 2020 levels*
- *Model transmission projects approved by Balancing Authorities (such projects would be operative by 2020)*
- *Adjust existing renewables to reflect expected output level for season and time of day*
- *Model expected implementation of OTC (e.g. repowering)*

## Develop Post-Renewable Study Cases

For each of the nine CTPG Scenarios:

- Add renewable resources sufficient to cover Net Short and meet a 33% RPS
- Decrease fossil fired resources based on merit order but meeting local area requirements

## Perform Contingency Analysis

For the Pre-renewable and Post-renewable Study Cases

- Perform Power Flow, Voltage Stability
- Record system performance that is does not comply with the Reliability Standards

## Develop Potential Mitigation

For all criteria violations caused by the renewables, develop mitigation measures\*

- New transmission line or station facilities
- SPS or operating procedures

\* The approval and implementation of mitigation measures is the responsibility of Balancing Authority(ies), project sponsors and jurisdictional regulatory authorities

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# CTPG STUDY RESULTS – BEN MORRIS

# Scope of Study

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- Evaluated system performance with respect to the NERC Reliability Standards and WECC Reliability Criteria using
    - Power flow
    - Voltage Stability
    - Transient Stability
  - Developed Study Cases for each scenario
  - Performed Contingency Analysis
  - Identified problems and potential mitigation\*
- \* The approval and implementation of mitigation measures is the responsibility of Balancing Authority(ies), project sponsors and jurisdictional regulatory authorities

# Potential Mitigation by Scenario \*

Scenario Name	PNW		NW NV			South-to-North	CPUC Public Policy	Central CA	West of River Import	
	1	2	3	3S	4	5	6	7	8	9
Scenario #	1	2	3	3S	4	5	6	7	8	9
Season	Spring	Spring	Sum	Sum	Sum	Fall	Sum	Sum	Fall	Fall
Path Flow Level	Stress	Fndtn	Stress	Stress	Fndtn	Fndtn	Fndtn	Fndtn	Fndtn	Fndtn
<b>Transmission Mitigation</b>										
Malin-Tesla Mitigation (CJ-Olinda #2)	x									
Malin-Tesla Mitigation (Olinda-Tracy #2)	x		x							
Malin-Table Mountain-Tesla Mitigation	x (M-RM)	x (M-RM-TM)								
Table Mountain Mitigation				x						
RM-Cottonwood Mitigation		x								
Drum-Rio Oso Mitigation			x	x	x					
LB-Westley Mitigation					x	x	x	x		
Midway-Tesla Mitigation						x			x	x
Monta Vista-Saratoga Mitigation								x		
Morro Bay Mitigation								x		
Gates-Henrietta Mitigation								x		
Haskell Canyon Mitigation	x	x				x				
Ivanpah Mitigation	x	x	x	x	x	x	x	x	x	x
Kramer Mitigation	x	x	x	x	x	x	x (C-L 230)	x	x	x
Otay-Mesa Mitigation									x	x
Highline-Mid X Mitigation							x			

\* The implementation of any required mitigation will be determined by the Balancing Authority(ies) and Transmission Owner(s)/Developer(s) following a more detailed evaluation to be conducted by these entities

# Description of Potential Mitigation \*

Transmission Mitigation	Description
Malin-Tesla Mitigation (CJ-Olinda #2)	2nd Captain Jack-Olinda 500 kV in common corridor with existing COTP
Malin-Tesla Mitigation (Olinda-Tracy #2)	2nd Olinda-Tracy 500 kV in common corridor with existing COTP
Malin-Tesla/Tracy Mitigation	Increase RAS for double line outages to address overloads between Malin and Round Mountain and between Tesla and Tracy
Table Mountain Mitigation	2nd Table Mountain-Tesla 500 kV or 2nd Table Mountain 500/230 kV transformer
RM-Cottonwood Mitigation	Reconductor between Round Mountain and Cottonwood 230 kV
Drum-Rio Oso Mitigation	Reconductor between Drum and Dutch Flat or SPS trip of Westwood generation
LB-Westley Mitigation	Reconductor the Los Banos-Westley #1 and #2 230 kV circuits
Midway-Tesla Mitigation	Midway-Gates-Gregg-Bellota-Tesla 500 kV or Midway-Gates-Los Banos-Tesla kV plus Gates-Gregg 500 kV
Monta Vista-Saratoga Mitigation	Reconductor Monta Vista-Hicks and Monta Vista-Saratoga 230 kV
Morro Bay Mitigation	Reconductor Morro Bay – Q166 230 kV
Gates-Henrietta Mitigation	Rebuild and establish 2-conductor bundled circuits for the Gates-Henrietta 230 kV
Haskell Canyon Mitigation	New Haskell Canyon-Olive- Sylmar 230 kV by relocating transformers from Olive to Haskell Canyon and converting existing 115 kV transmission to 230 kV
Ivanpah Mitigation	2nd Ivanpah-Eldorado 230 kV and SPS generation trip
Kramer Mitigation	Coolwater- Lugo 230 kV line plus potentially one of the following: a) Revise existing Kramer RAS to trip more generation, b) Second Kramer-Llano 500 kV line, or c) A second 500 kV line between Kramer & Windhub or Midway or Pisgah
Otay-Mesa Mitigation	SPS trip of Imperial Valley ROA 230 kV for local outage
Highline-Mid X Mitigation	Reconductor Highline-Midway X 230 kV or establish SPS to trip Midway X generation

\* The implementation of any required mitigation will be determined by the Balancing Authority(ies) and Transmission Owner(s)/Developer(s) following a more detailed evaluation to be conducted by these entities

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# **2011 PHASE III STATEWIDE TRANSMISSION PLAN METHODOLOGY– JAN STRACK**

# 2011 Statewide Transmission Plan

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- The CTPG has followed its 2010 adopted three step approach to developing the CTPG Statewide Transmission Plan
  - Step 1: Identified “High Ranked CREZs” using commercial interest
    - CPUC Discounted Core
      - ✓ IOUs PPA under CPUC review by 6/1/2010
      - ✓ Permit application data adequate by 3/1/2010
    - CTPG Queue Portfolio
      - ✓ Have or in process of signing Interconnection Agreement
      - ✓ Posted financial security in ISO Phase II Cluster Studies



# 2011 High Ranked CREZs

CREZ	% Discounted Core In Queue
Carrizo North/South	94
Imperial South	100
Kramer	100
Mountain Pass	100
Palm Springs	100
Pisgah	100
Riverside East	100
San Bernardino-Lucerne	100
Solano	100
Tehachapi	100

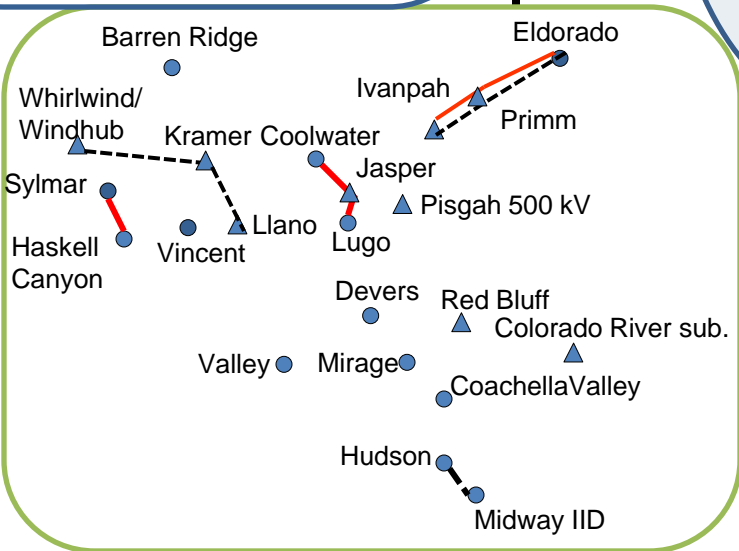
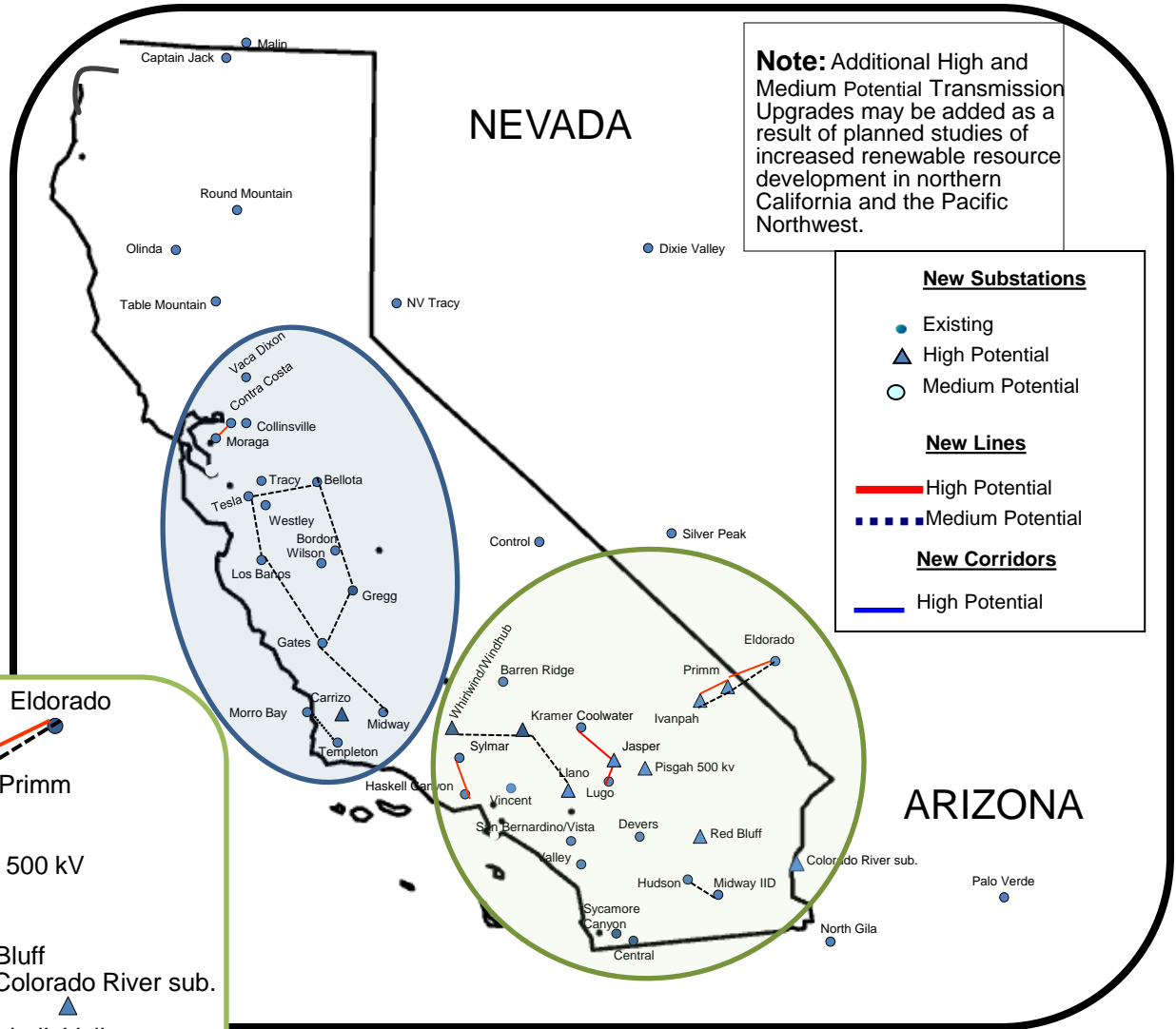
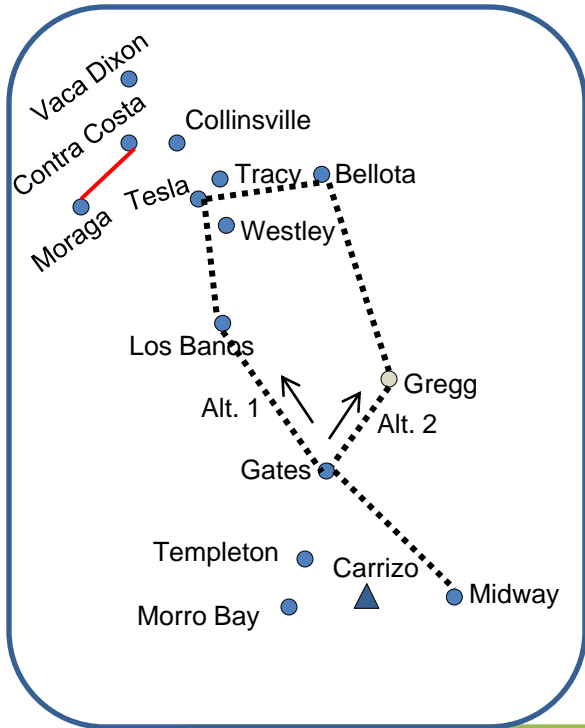
# 2011 Statewide Transmission Plan

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- Step 2: Identified “High Potential” and “Medium Potential” Transmission Elements
  - ✓ Identified transmission elements associated with High Ranked CREZs
    - High potential elements support connection of the High Ranked CREZs to the network. Expected to carry a significant amount of renewable power from High Ranked CREZs to load.
    - Medium potential elements carry a comparatively lower level of output from High Ranked CREZ or are generally associated with a large build out of High Ranked CREZs
  - ✓ Compiled a list of “High Potential” and “Medium Potential” transmission elements (Table 3 of Statewide Plan)

# 2011 CTPG Statewide Transmission Plan

## High and Medium Potential Transmission Upgrades



# 2011 State-Wide Transmission Plan

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- Step 3: Identified “High Potential Transmission Corridors”
  - Similar to 2010, the CTPG has chosen to identify “High Potential Transmission Corridors” for future study for the following reasons:
    - There remains considerable uncertainty regarding the precise location and amount of renewable resources
    - Load serving entities are still finalizing procurement decisions as the regulations and rule making surrounding renewable energy credits (REC) and green house gas reductions are developed
    - The existing purchase power agreements (PPA) may be insecure
      - ✓ Inability to meet some scheduling terms
      - ✓ PPAs may contain milestones that if not achieved render the contract terms invalid

# 2011 State-Wide Transmission Plan

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- “High Potential Transmission Corridors” Continued:
  - Provides California’s load serving entities with potential future procurement options beyond the “High Ranked CREZ”
  - Recognizes the potential for renewable resource projects that may be developed faster and for less cost
  - Recognizes the potential for reduced total procurement costs, i.e., combined generation and transmission costs

# 2011 State-Wide Transmission Plan

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- “High Potential Transmission Corridors” Continued:
  - Will sustain a competitive renewable resource development and procurement environment as final procurement decisions are made by the State’s load serving entities
  - The CTPG believes that additional renewable resource options should be explored because California will have additional renewable resource needs beyond 2020 and to address future GHG reduction polices

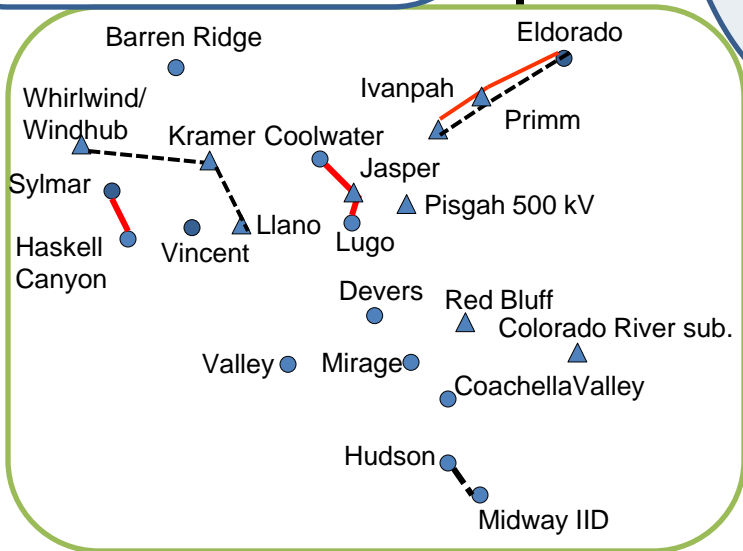
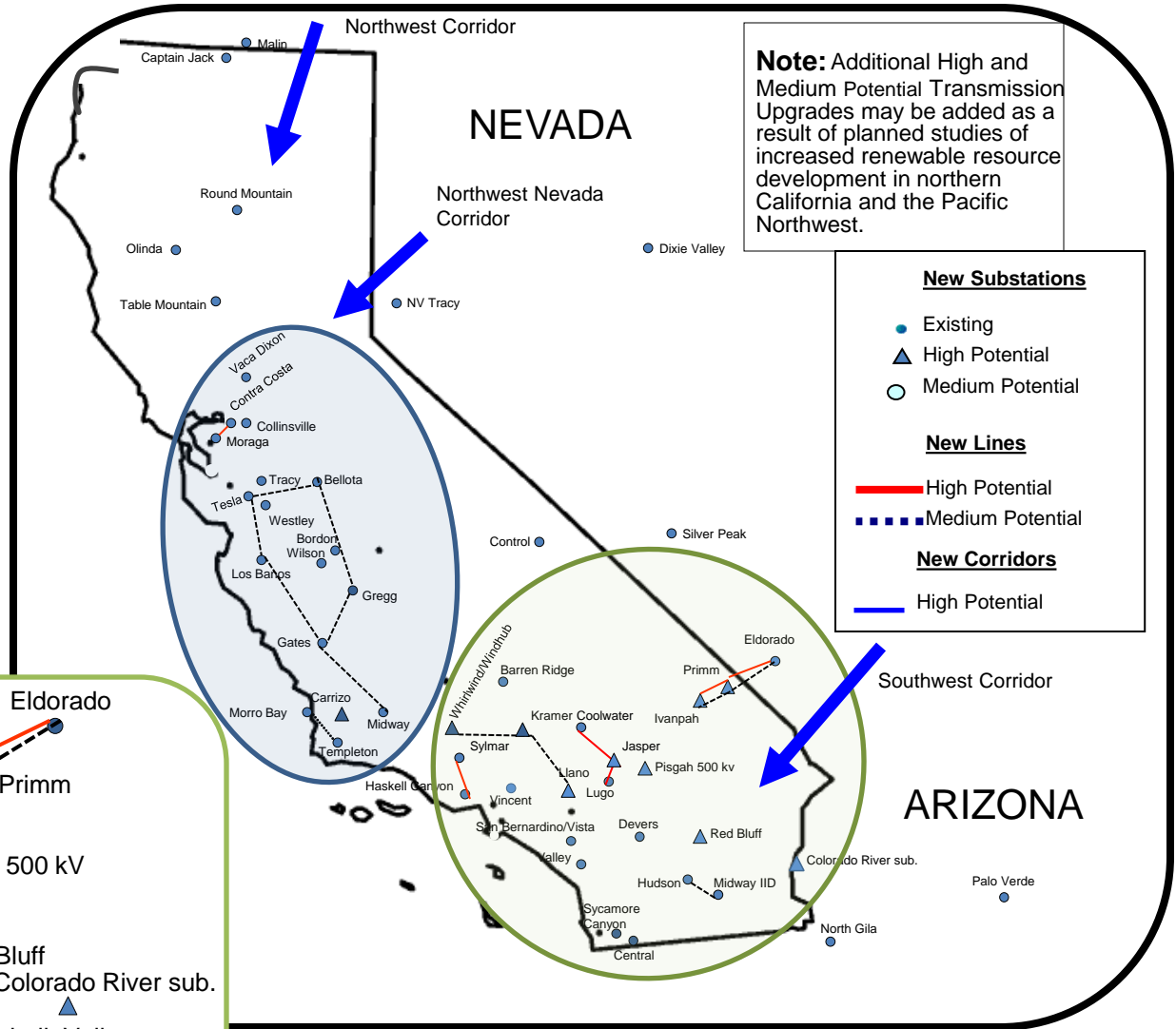
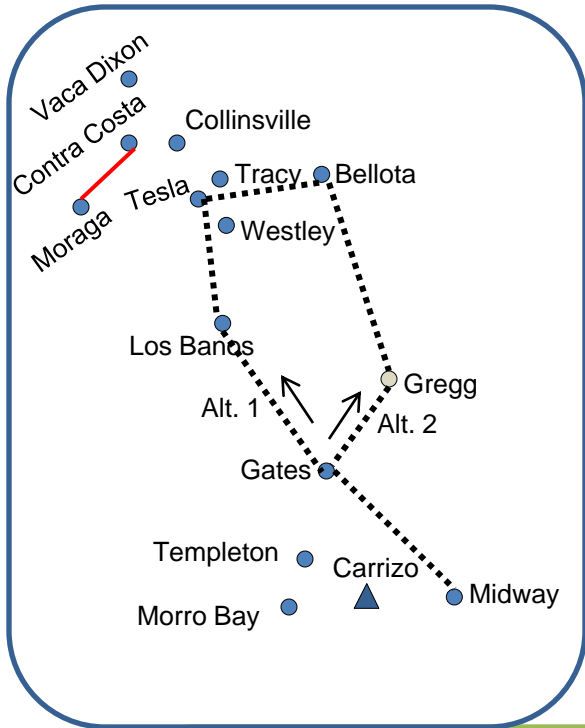
# 2011 State-Wide Transmission Plan

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- Similar to 2010, the CTPG has selected “High Potential Transmission Corridors” that meet a majority of the following criteria:
- Recognition by other sub-regional planning groups for study as potential WECC transmission system improvements
  - Potential for geographic, weather, and resource diversity for California’s renewable resource portfolio beyond that provided by renewable developed primarily in southern California,
  - Strong support by federal and state governments required for the completion of the renewable resource projects and transmission improvements that would provide renewable energy throughout the western United States.
  - Potential access to entities that are currently planning for the development or renewable energy resources well beyond their own needs for potential import into California.

# 2011 CTPG Statewide Transmission Plan

## High and Medium Potential Transmission Upgrades and Corridors





# 2011 Statewide Transmission Plan

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- Updated California Balancing Authority Area Transmission Planning Information
  - California Independent System Operator
  - Los Angeles Balancing Authority
  - Balancing Authority of Northern California
  - Imperial Irrigation District Balancing Authority
  - Turlock Irrigation District Balancing Authority

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# STAKEHOLDER INPUT – JAN STRACK

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# MEETING WRAP-UP AND NEXT STEPS – MO BESHIR

# Next Steps

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- Stakeholder comments requested by January 30<sup>th</sup>
- Executive Committee will consider the Draft 2011 Statewide Transmission Plan for approval on February 2<sup>nd</sup> in San Francisco.
- The CTPG will post the Final Statewide Transmission Plan on or before March 1<sup>st</sup>.



Thank you for your input