CTPG Stakeholder Meeting
2011 Work Plan

May 19, 2011

MEETING WELCOME – MO BESHIR
CTPG TECHNICAL STEERING COMMITTEE CHAIR

AGENDA

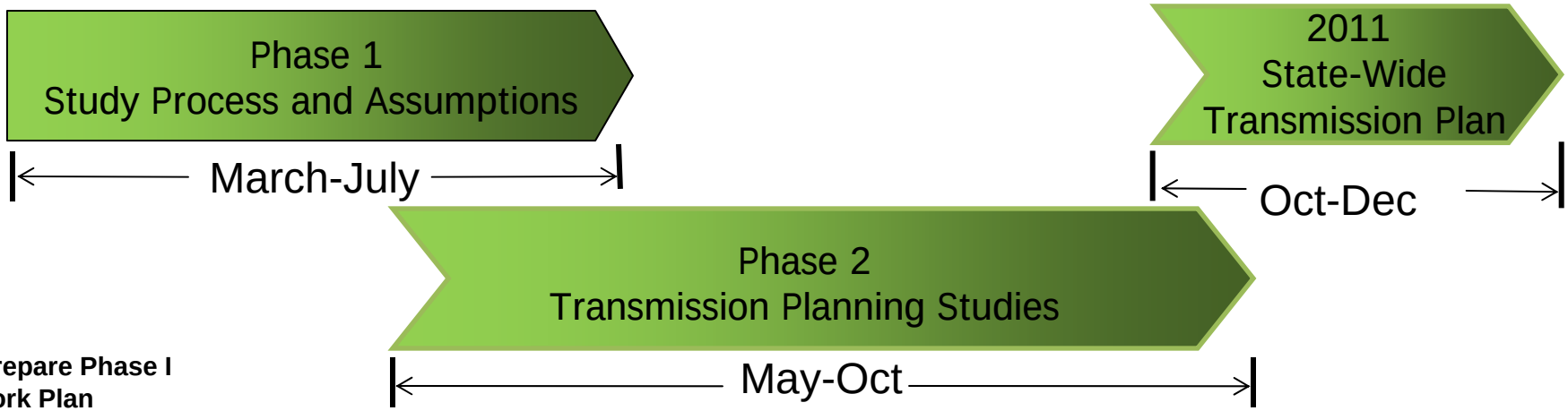
Meeting Welcome	1:05 – 1:10	Mo Beshir
Meeting Agenda	1:10 – 1:15	Mo Beshir
2011 CTPG Work Plan	1:15 – 1:20	Mike Deis
Phase I Study Process and Assumptions		
✓Verify Modeling of Existing Renewables	1:20 – 1:25	Dave Larsen
✓Determine OTC Assumptions	1:25 –1:30	Jonathan Shearer
✓Determine Re-dispatch Methodology	1:30 –1:35	Jan Strack
✓Determine Path Flow Assumptions	1:35 –1:40	Jan Strack
✓Update Net Short	1:40 –1:45	Gary DeShazo
✓Develop Foundation Base Case	1:45 –1:50	Craig Cameron
✓Develop Dynamic Study Approach	1:50 –1:55	Gary DeShazo
✓Coordinate with TEPPC	1:55 –2:00	Mo Beshir
✓Website Improvements	2:00 –2:05	Ben Brownlee

AGENDA

Phase I, Study Process and Assumptions		
✓Topics Not Considered At This Time	2:05 – 2:10	Mike Deis
Stakeholder Input	2:10 – 2:45	Mike Deis
Phase II, Transmission Planning Studies		
✓2010 Scenario Review	2:45 – 2:55	Garry Chinn
✓2011 Proposed Scenarios	2:55 – 3:05	Mike Deis
✓Stakeholder Alternative Transmission Mitigation	3:05 – 3:10	Mike Deis
Stakeholder Input	3:10 –3:55	Mike Deis
Meeting Wrap-Up and Next Steps	3:55 –4:00	Mo Beshir
Adjourn	4:00	

2011 CTPG WORK PLAN – MIKE DEIS

CTPG 2011 WORK PLAN



•Prepare Phase I Work Plan

•Determine Base Case Approach

•Verify Existing Renewables

•Incorporate OTC Assumptions

•Review Path Flow Assumptions Prior To Dispatch of Renewables

•Update Net Short

•Review Re-dispatch Methodology

•Review Dynamic Stability Study Approach

•Coordinate with TEPPC

•Prepare Phase II Work Plan

•Develop Renewable Portfolios/Scenarios

•Prepare Study Plan(s)

•Update Renewable Development Information

•Perform Studies

•Refine the Determination of the High and Medium Potential Transmission Needs and Corridors

•Identify 2011 State-Wide Transmission Plan Elements

•Identify 2011 Lessons Learned

•Begin Preparation of 2012 Work Plan

2011 WORK PLAN SCHEDULE

Milestone	2011									2012			
	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April
Phase I Study Processes & Assumptions													
Executive Committee Meeting (May 5th)													
Phase I Work Plan													
Stakeholder Meeting (May 19th)													
Prepare Report													
Stakeholder Meeting (June 14th)													
Executive Committee Meeting (July 7th)													
Phase II Transmission Studies													
Phase I/Phase II Work Plan													
Stakeholder Meeting (May 19th)													
Prepare Study Plan													
Stakeholder Meeting (July 1st)													
Perform Studies													
Prepare Study Report													
Executive Committee Meeting (Sept. 1st)													
Stakeholder Meeting (Sept. 14th)													
Final Report													
Executive Committee Meeting (Nov. 3rd)													
Phase III Statewide Transmission Plan													
Prepare Report													
Stakeholder Meeting (Nov. 3rd)													
Final Report													
Executive Committee Meeting (Jan. 5th)													
Post Final Statewide Transmission Plan													

PHASE 1: STUDY PROCESS AND ASSUMPTIONS

VERIFY MODELING OF EXISTING RENEWABLES – DAVE LARSEN

VERIFY MODELING OF EXISTING RENEWABLES

- Objectives
  - Determine if the WECC 2020 HS Seed Case accurately reflects the type, amounts, and locations of existing and planned renewable energy resources as well as expected amounts of generation resources connected at the distribution level that are planned to be in-service by the end of 2011
  - Modify the Seed Case as required to add any “un-modeled” resources
- Approach
  - CTPG has reviewed existing CEC data bases regarding existing resources in-service as of December 2010 and is obtaining similar information for resources to be added in 2011
  - Information on the resources that were in service as of December 2010 is summarized in the table on slide 12

VERIFY MODELING OF EXISTING RENEWABLES

- Approach
  - A spreadsheet summarizing information on the various units summarized below has been sent to CTPG for review so as to identify the pertinent interconnection point and capacity for each unit
  - The data obtained from this review will be used to prepare change files to update the 2020 Seed Case

VERIFY MODELING OF EXISTING RENWABLES

Existing Renewable Generation as of December 2010			
Resource Type	Capacity (MW)	2010 Energy (TWH)	Number of Units/Plants
Biomass	1,049	5.7	124
Geothermal	2,687	13.1	68
Small Hydro	1,222	4.4	213
Solar	429	0.9	21
Wind	3,019	4.8	TBD
Total	8,406	28.9	

DETERMINE ONCE-THROUGH-COOLING ASSUMPTIONS – JONATHAN SHEARER

ONCE-THROUGH COOLING COMPLIANCE OPTIONS

- On May 4, 2010, the State Water Resources Control Board adopted a Statewide Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling under Resolution No. 2010-0020

- Plant owners/operators were required to submit implementation plans on April 1, 2011 to the Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS)
  - Where possible the CTPG will use information from the recently released implementation plans

- Three out of 17 plants already shutdown or re-powered
  - Humboldt Bay – re-powered, air cooling
  - Potrero – shut down
  - South Bay – shut down

- The remaining 14 plants submitted implementation plans

- Diablo Canyon and San Onofre will be modeled as base-loaded

ONCE-THROUGH COOLING COMPLIANCE OPTIONS

- Retirement by Compliance Deadline

- Track 1 – Closed-Cycle Cooling
  - Will the units be re-powered or retrofitted, and will closed-cycle wet cooling or dry cooling be used
  - Decreased water inflow rate

- Track 2 – Comparable control using operational or structural measures
  - Reduce Impingement Mortality and Entrainment
  - Must also demonstrate Track 1 is not feasible

- Immediate and Interim Requirements must also be addressed
  - Large organism exclusion devices
  - Cease water intake on non-power generating units unless need demonstrated

ONCE-THROUGH COOLING IMPLEMENTATION PLANS

Generating Station	Owner	Units	Existing Capacity (MW)	Compliance Option	Repower/Replacements	Cooling Type	Implementation Timeline	Minimum Capacity
AES Alamitos Generating Station	AES Southland, LLC	1-6	1,950	Track 1	single-cycle or combined-cycle gas turbine	air-cooled condensers, confidential technology, mechanical draft cooling towers, or closed-cycle wet cooling system using reclaimed/recycled water	Beyond Dec 31, 2020	1,417 MW at all times during transition
AES Huntington Beach Generating Station	AES Southland, LLC	1-4	900	Track 1	single-cycle or combined-cycle gas turbine	air-cooled condensers, confidential technology, mechanical draft cooling towers, or closed-cycle wet cooling system using reclaimed/recycled water	Beyond Dec 31, 2020	Not less than 800 MW during transition
AES Redondo Beach Generating Station	AES Southland, LLC	5-8	1,356	Track 1	single-cycle or combined-cycle gas turbine	air-cooled condensers, confidential technology, mechanical draft cooling towers, or closed-cycle wet cooling system using reclaimed/recycled water	Beyond Dec 31, 2020	Not less than 946 MW during transition
Contra Costa Generating Station	GenOn Delta, LLC	6-7	690	Retirement	-	-	2013	
El Segundo Generating Station	El Segundo Power, LLC	1-2	0	Track 1	rapid response combined cycle, 560 MW	air-cooled condensers, or dry cooling towers	2013	
El Segundo Generating Station	El Segundo Power, LLC	3	335	Retirement	-	-	2013	
El Segundo Generating Station	El Segundo Power, LLC	4	335	Track 1	air-cooled combined cycle	air-cooled condensers	Retired by 2017 if unable to repower	
Encina Power Station	Cabrillo Power I LLC	1-3	321	Track 1	fast-start high-efficiency combined-cycle, 558 MW	air-cooled condensers	2017	
Encina Power Station	Cabrillo Power I LLC	4-5	630	Track 2	IM&E Reductions - Physical and Control Measures	-	2017	

ONCE-THROUGH COOLING IMPLEMENTATION PLANS

Generating Station	Owner	Units	Existing Capacity (MW)	Compliance Option	Repower/Replacements	Cooling Type	Implementation Timeline	Minimum Capacity
Harbor Generating Station	LADWP	5	65	Track 1	TBD, 65 MW	Wet/Dry Cooling. TBD	2031	Existing Capacity
Haynes Generating Station	LADWP	5-6	535	Track 1	Six simple cycle gas turbines 600 MW	Dry Cooling	2013	535 MW
Haynes Generating Station	LADWP	1-2	444	Track 1	TBD, 444 MW	Wet/Dry Cooling. TBD	2027	Existing Capacity
Haynes Generating Station	LADWP	8	235	Track 1	TBD, 250 MW	Wet/Dry Cooling. TBD	2035	235 MW
Humboldt Bay Power Plant	PG&E	1-10	166	n/a	Repowered.	-	Complete	
Mandalay Generating Station	GenOn West, L.P.	1-2	430	Track 2	operational and technological measures	-	Prior to Dec 31, 2020	
Morro Bay Power Plant	Dynergy Morro Bay, LLC	1-4	650	Track 2	impingement and entrainment control measures, or repower only 3 & 4 to simple-cycle combustion turbine for 164 MW	-	By Dec 31, 2015	
Moss Landing Power Plant	Dynergy Moss Landing, LLC	1-2	1,020	Track 2	Repowered to high efficiency combined-cycle units in compliance with Best Technology Available (BTA), 1020 MW	-	Compliance through 2032	
Moss Landing Power Plant	Dynergy Moss Landing, LLC	6-7	1,509	Track 2	impingement and entrainment control measures, or repower to a simple-cycle combustion turbine for 100-180 MW	-	By Dec 31, 2017	

ONCE-THROUGH COOLING IMPLEMENTATION PLANS

Generating Station	Owner	Units	Existing Capacity (MW)	Compliance Option	Repower/Replacements	Cooling Type	Implementation Timeline	Minimum Capacity
Ormond Beach Generating Station	GenOn West, L.P.	1-2	1,520	Track 2	operational and technological measures	-	Prior to Dec 31, 2020	
Pittsburg Generating Station	GenOn Delta, LLC	5-6	660	Track 1	Unit 7 mechanical draft closed-cycle cooling towers to be reused for the condenser circulating water system for 5 & 6	Retrofit to closed-cycle cooling	By Dec 31, 2017	
Pittsburg Generating Station	GenOn Delta, LLC	7	740	Retirement	-	-	2016	
Potrero Generating Station	GenOn Petrero, LLC	3	0	Retired	-	-	February 28, 2011	
Scattergood Generating Station	LADWP	3	460	Track 1	One combined cycle and two simple cycle, or two combined cycle with dry cooling, 509 or 574 MW	Dry Cooling	2015	460 MW
Scattergood Generating Station	LADWP	1-2	367	Track 1	TBD, 367 MW	Wet/Dry Cooling. TBD	2024	
South Bay Power Plant	Duke Energy South Bay, LLC	1-4	0	Retired	-	-	-	

LOCATION CONSTRAINED RESOURCE REQUIREMENTS

- The CTPG will review the need for generation within local areas in order to meet applicable local area reliability requirements
  - CAISO's "*2013-2015 Local Capacity Technical Analysis, Report and Study Results*"
  - Similar studies made available by other Balancing Authorities

- The CTPG Will assume OTC units repowered with efficient combined cycle technology to meet local reliability requirements

- No uncommitted transmission projects will be included
  - In the unlikely event a power flow solution cannot be obtained, a baseline
    set of transmission expansion assumptions may be needed
  - Following LCR amounts should provide adequate system conditions

DETERMINE PATH FLOW ASSUMPTIONS – JAN STRACK

PRE-RENEWABLE PATH FLOW ASSUMPTIONS

- Start with 2020 Heavy Summer seed case (a “typical” summer day)
- Include proposed transmission that has received Balancing Authority approval
- Incorporate assumptions regarding expected disposition of OTC units
  - ✓Retirements
  - ✓Repowering
  - ✓On-site Replacements
- Set up two sets of pre-renewable power flow cases:
  1. Selected paths “stressed” at or near existing ratings; other paths and interties at levels in the 2020 Heavy Summer seed case
  2. All paths and interties at levels in the 2020 Heavy Summer seed case
- Perform analysis of Summer peak condition and Fall off-peak condition

DETERMINE RE-DISPATCH METHODOLOGY – JAN STRACK

FOSSIL GENERATION DECREMENTING ASSUMPTIONS

- To each set of pre-renewable power flow cases, add renewables to reach 33% RPS

- Decrement corresponding amount of WECC fossil-fired generation
  - ✓Decrement only *dispatchable* fossil-fired generation
  - ✓Most QFs assumed non-dispatchable

- Decrement in economic merit-order WECC wide, subject to:
  - ✓Known constraints that require specific generators to be on-line under specific conditions (e.g., San Diego Area Unit Commitment Requirement for Voltage Stability)
  - ✓Minimum output of dispatchable units

- Drop the 70%/30% in-state/out-of-state constraint used in 2010 studies

- Survey transmission planning entities throughout WECC (**survey has been issued**)
  - ✓Identify dispatchable generators (**preliminary list prepared**)
  - ✓Obtain minimum output of dispatchable units (**preliminary numbers available**)
  - ✓Describe constraints requiring specific dispatchable units to be on line

- Default approach: Decrement in economic merit-order WECC wide

UPDATE NET SHORT – GARY DESHAZO

NET SHORT INFORMATION IS BEING UPDATED BY THE CEC

- CTPG is looking to the CEC for information
- Net short updates are being considered in the CEC's 2011 IEPR update process
- Key variables are methodology to incorporate demand side assumptions and existing renewable generation that impacts the calculation of renewable net short
- CEC approach is a forecast of ranges not a single point forecast
- Final CEC staff paper will hopefully be released in August

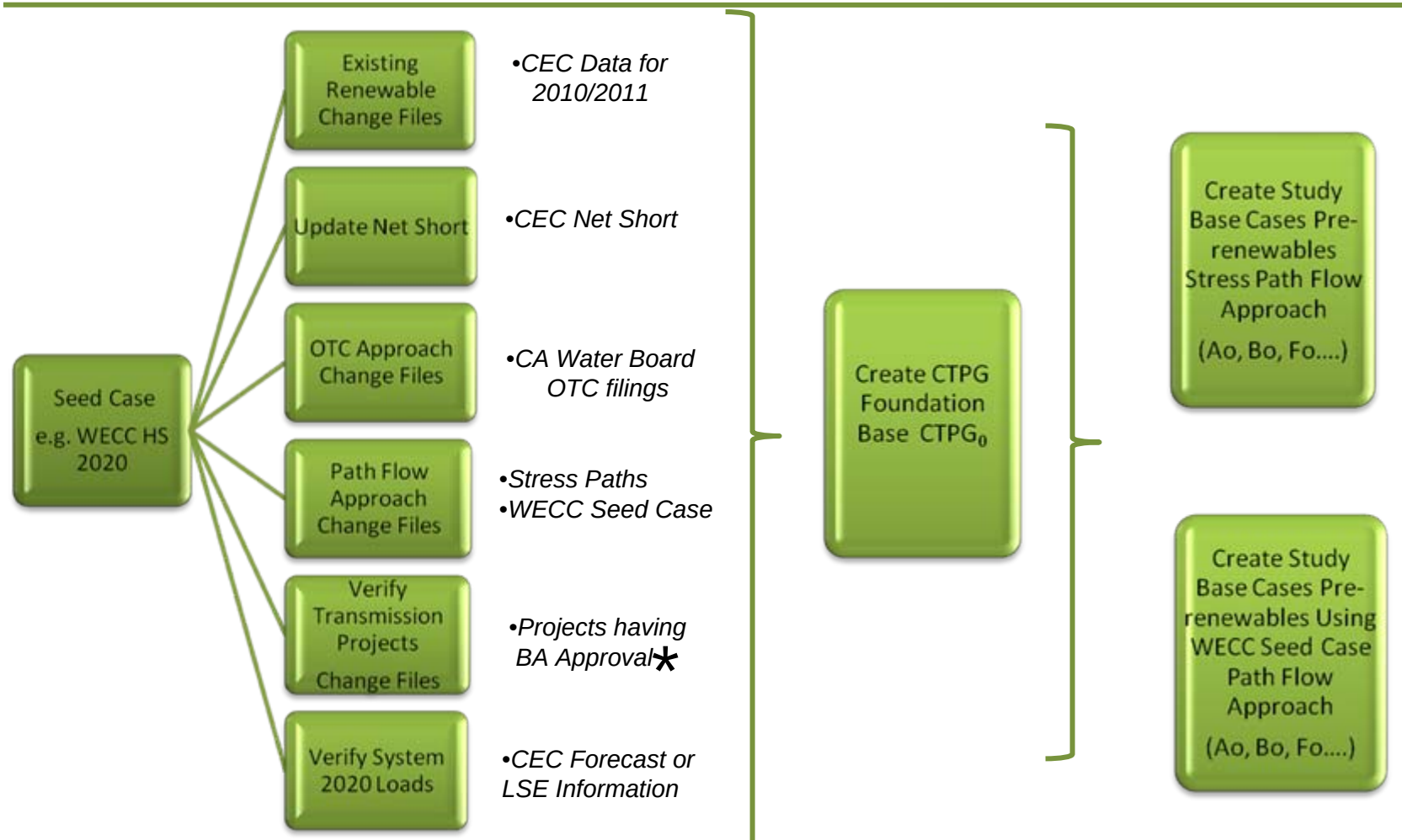
CEC – PROPOSED RENEWABLE NET SHORT RANGE FOR 2020

Preliminary Renewable Net Short by CEC As of April 28, 2011

	All Values in TWh for Year 2020	Formula	Lowest	Illustrative Example	Highest
1	Statewide Total Deliveries (Retail Sales)		297.5	303.3	310.3
2	Non RPS Deliveries (CDWR, WAPA, MWD)		13.6	13.6	13.6
3	Small LSE Sales for RPS (<200 GWh)		2.3	2.3	2.3
4	Retail Sales for RPS	4=1-2-3	281.6	287.4	294.4
5	Additional Energy Efficiency		19.9	17.1	15.2
6	Additional PV		1.9	1.9	0
7	Additional Combined Heat and Power		19.8	7.2	0
8	Adjusted Statewide Retail Sales for RPS	8=4-5-6-7	240	261.2	279.2
9	Total Renewable Energy Needed for 33% RPS	9=8*33%	79.2	86.2	92.1
10	Existing Renewable (2010)		38.9	38.9	38.9
11	Additional (end of 2011)		4.6	4.6	4.6
12	Total Existing Renewable (2011)	12=10+11	43.5	43.5	43.5
13	Renewable Net Short	13=9-12	35.7	42.7	48.6

DEVELOP FOUNDATION BASE CASE – CRAIG CAMERON

CTPG STUDY CASE DEVELOPMENT



*Will include 2011 ISO Board Approved Projects

DEVELOP DYNAMIC STUDY APPROACH – GARY DESHAZO

DYNAMIC STUDIES ARE A NECESSARY PART OF CTPG's ANALYSIS

- Some dynamic analysis was performed in the 2010 phase 2 effort
  - Analysis is complicated and time consuming
  - Data is complex and detailed
  - Dynamic models of renewable resources are improving but lacking accuracy
- CTPG will perform limited dynamic studies in 2011
  - Dynamic analysis on all alternatives is not needed
  - Dynamic results can be used to "verify" and "validate" power flow results
  - CTPG is developing a process to determine when specific dynamic analysis is needed

COORDINATE WITH THE TEPPC – MO BESHIR

COORDINATE WITH TEPPC

- The Western Electricity Coordination Council (WECC) formed the Transmission Expansion Planning Policy Committee (TEPPC) and its subcommittees to provide transmission expansion planning coordination across the Western Interconnection

COORDINATE WITH TEPPC

- CTPG is recognized and approved as a sub-regional transmission planning group by TEPPC:
  - TEPCC approval on February 24, 2011
  - CTPG representative approved by WECC Board to TEPPC
  - CTPG also has representation on the Sub-regional Coordinating Group (SCG)
- CTPG has initiated discussions with SWAT and other sub-regional groups for coordination in data gathering, planning, and study activities
- CTPG will align its work with TEPPC's timeline, as needed, to allow for better coordination

WEBSITE IMPROVEMENTS – BEN BROWNLEE

WEBSITE IMPROVEMENTS

- Full-Time "Contact Us" Feature
- Full-Time Stakeholder Feedback Feature
- Tracking Stakeholder Comments
- Frequently Asked Questions Webpage
- Project Status List
- Archive 2010 & Older Documents
- Updated CTPG Committees
- “Calendar-Organized” Postings
- Revise Home page ("Welcome" and "General Principles“)

TOPICS NOT CONSIDERED AT THIS TIME – MIKE DEIS

TOPICS NOT CONSIDERED AT THIS TIME

- Energy Storage
- Benefit Cost Analysis of Transmission Alternatives
- Phasing of Proposed Transmission Upgrades
- Proposed Environmental Scoring of Transmission Upgrades

STAKEHOLDER INPUT – MIKE DEIS

PHASE II: TRANSMISSION PLANNING STUDIES – MIKE DEIS

2010 CTPG SCENARIO REVIEW – GARRY CHINN

2010 CTPG PHASE 1

- Case A: 2020 Northern California adverse weather
  (1-in-10 year peak conditions in northern California coincident with approximately 1-in-2 year peak conditions in southern California)

- Case B: 2020 Southern California adverse weather
  (1-in-10 year peak conditions in southern California coincident with approximately 1-in-2 year peak conditions in northern California)

- Case C: 2020 normal weather (1-in-2) for each Load Serving Entity

- Case L: 2020 light spring weather (off-peak sensitivity to Case A)

2010 CTPG PHASE 2

- Several additional renewable generation portfolios were included:
  - Commercial interest, based on gen queues
  - RETI “Heavy In-State”
  - 5,000 MW of photovoltaic in Owens Valley area
  - Northern
  - Southwest
- Case A: 2020 Northern California adverse weather
- Case B: 2020 Southern California adverse weather
- Case OTC-A: Case A with identified Once Through Cooling resources off
- Case OTC-B: Case B with identified Once Through Cooling resources off

2010 CTPG PHASE 3

- Included RETI “Best CREZ” renewable generation portfolio
- Included several additional major transmission upgrades
  - Midpoint-Devers-Valley
  - Tehachapi Renewable Transmission Project Segments 1-11
  - Barren Ridge/Haskell Canyon/Rinaldi
  - Owens Valley

- Case A: 2020 Northern California adverse weather
- Case B: 2020 Southern California adverse weather
- Case F: 2020 California Autumn morning, light load

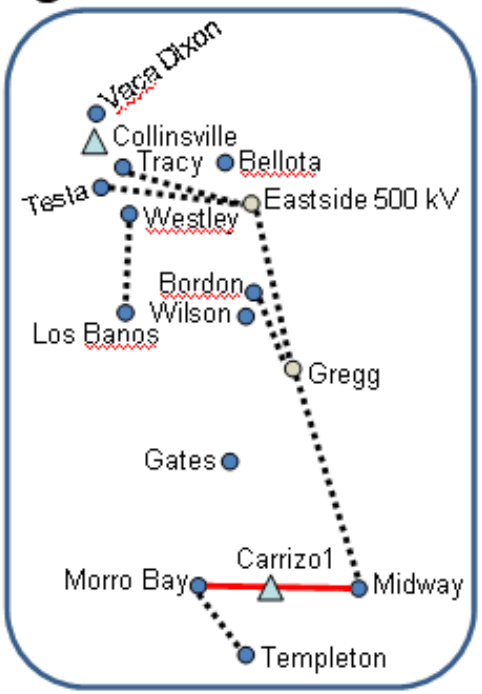
2010 CTPG PHASE 4

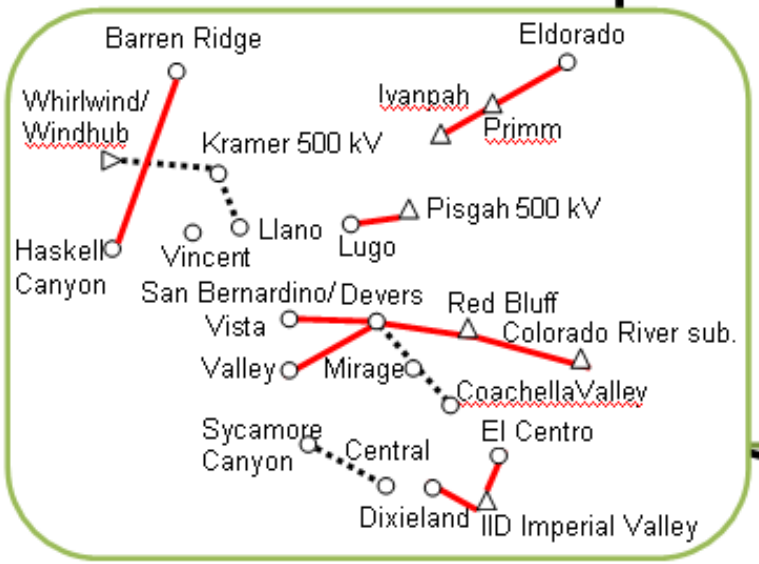
- Focused on RETI “West of River Stress” scenario with delivery of much larger amounts of out-of-state renewable energy resources into California from southern Nevada and western Arizona

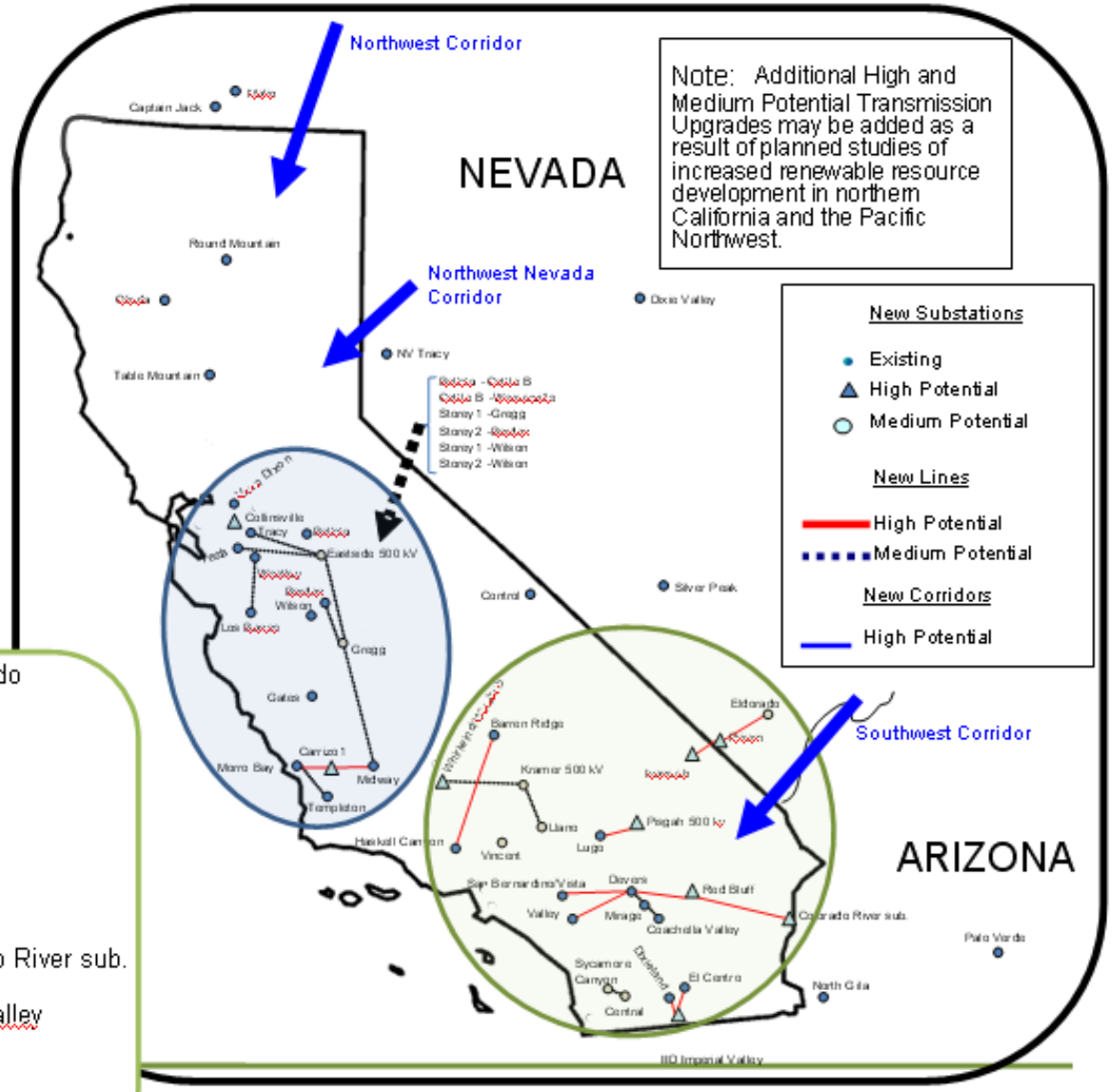
- Case A: 2020 Northern California adverse weather
- Case B: 2020 Southern California adverse weather

- Case F1: 2020 Light Autumn with High West of River flows
- Case F2: 2020 Light Autumn with West of River flows of 6,700 MW

2010 CTPG Statewide Transmission Plan
High and Medium Potential Transmission Upgrades and Corridors







2011 PROPOSED SCENARIOS – MIKE DEIS

2011 PROPOSED SCENARIOS

	Scenario	Description
1	Pacific Northwest High Potential Corridor	Wind resource imports from Pacific Northwest combined with hydro runoff (May) + CPUC discounted core resources
2	Northwest Nevada High Potential Corridor	Geothermal/Solar imports from northwest NV, northern CA wind + CPUC discounted core resources, peak summer day
3	CPUC - Trajectory	Emphasizes IOU commercial interest resources + CPUC discounted core resources
4	CPUC - Cost Constrained	Emphasizes utilization of lowest cost resources, assumed available transmission capacity, some identified "minor" transmission upgrades, use of undelivered out-of-state RECs + most of the CPUC discounted core.
5	CPUC - Environmentally Constrained	Emphasizes utilization of assumed available transmission capacity and identified "minor" transmission upgrades and associated resources + most of the CPUC discounted core.
6	CPUC – Time Constrained	Emphasizes utilization of resources expected to be available the earliest, assumed available transmission capacity, some identified "minor" transmission upgrades and associated resources. More use of undelivered out-of-state RECs. Uses most of the CPUC discounted core.

STAKEHOLDER ALTERNATIVE TRANSMISSION MITIGATION – MIKE DEIS

ALTERNATIVE TRANSMISSION MITIGATION

- As part of the 2010 CTPG studies, the CTPG solicited transmission mitigation alternatives to the transmission mitigation studied by CTPG

- The CTPG received 13 proposed transmission mitigation alternatives from stakeholders

- The CTPG is requesting stakeholder input on whether or not the request for transmission mitigation alternatives should be included in the CTPG 2011 studies

STAKEHOLDER INPUT – MIKE DEIS

MEETING WRAP-UP AND NEXT STEPS – MO BESHIR

NEXT STEPS

- Written stakeholder comments due by June 2, 2011
- Phase I Report will be posted by ~ June 6, 2011
- Stakeholder meeting to discuss Phase I Report ~ June 20, 2011
- Draft Study Plan will be posted for review by ~ June 21, 2011
- Stakeholder meeting to discuss Draft Study Plan ~ July 1, 2011

Thank you for your input