

CALIFORNIA
TRANSMISSION
PLANNING
GROUP



CTPG Subregional Planning



Joint CCPG-SSPG-SWAT Meeting

August 17, 2011



Outline

- Background
- Objective
- Principles
- Organization / Membership / Committees
- Stakeholder Involvement / Website
- 2011 Study Work

CTPG Background

- CTPG Background
 - CTPG was formed in 2009 at the urging of FERC to provide a forum for coordinating California state-wide transmission planning
 - CTPG issued its first conceptual 2010 statewide transmission plan in February, 2011.
 - The 2010 state-wide transmission plan identified transmission needs that would meet an RPS of approximately 24% by 2020.
 - 2011 Work Plan Underway

CTPG Objective

- Purpose is to provide a forum for conducting joint transmission planning and coordination of transmission activities to meet the needs of California
- To develop a California state-wide transmission plan to meet the state's 33% RPS renewable goal
- To ensure coordination with all members' individual transmission plans
- Consistent with FERC 890 Principles

CTPG Principles

- Coordinate planning among CAISO, POU's and IOU's to develop a transmission plan for California.
- Develop and implement cost-effective transmission expansion to promote reliability, efficiency, and accessibility on a voluntary basis.
- Planning is not constrained by institutional practices that indicate upgrades be operated or controlled by a specific Balancing Authority and/or subject to specific contract or tariff arrangements.
- Perform studies to evaluate the reliability impacts, costs and benefits of proposed transmission projects.
- Create plans that adhere to NERC and WECC reliability standards.
- Implement and adhere to the nine FERC Order 890 planning principles.
- Support state policy objectives

CTPG ORGANIZATION

CTPG Executive Committee
Chair: Jim Avery SDG&E

Technical Steering Committee
Chair: Mo Beshir LADWP

Scenario Team
Technical Study Team
Writing Team

CTPG Organization

- Executive Committee
- Legal Committee
- Project Manager

- Technical Steering Committee
 - Assumptions/Scenario Team
 - Writing Team
 - Study Team

Members and Participants

- California Independent System Operator (CAISO)
- Imperial Irrigation District (IID)
- Los Angeles Department of Water and Power (LADWP)
- Pacific Gas and Electric (PG&E)
- Southern California Edison (SCE)
- Southern California Public Power Authority (SCPPA)
- San Diego Gas and Electric (SDG&E)
- Sacramento Municipal Utility District (SMUD)
- Transmission Agency of Northern California (TANC)
- Turlock Irrigation District (TID)
- Western Area Power Administration (Western)

Members and Participants

- Transmission owners and operators
- Designated as TP or PA under NERC

- Non-Member Participants
 - CAISO
 - Western

Stakeholder Involvement

- CTPG study process is open and transparent:
 - Assumptions, methods, and results are documented and publicly available (<http://www.ctpg.us>)
 - Stakeholder meetings
 - Executive meetings include public portion
- Initial study process coordinated with the Renewable Energy Transmission Initiative (RETI) and the broad range of interests the group represents
- CTPG is open to engaging other organizations (e.g. Desert Renewable Environmental Conservation Plan, Western Independent Transmission Group)

Stakeholder Involvement

- CTPG's writing team responds to stakeholder comments and question
 - Posted on the website: www.ctpg.us
 - Recent Improvements
- Study Plans, Reports also posted

WEBSITE IMPROVEMENTS

The screenshot shows the website's navigation menu with the following items: HOME, MEMBERS & PARTICIPANTS, MEETINGS, PLAN DEVELOPMENT, ARCHIVED DOCUMENTS, CONTACT, and FAQs. The MEETINGS dropdown menu is open, showing 'Executive Committee' and 'Stakeholder'. A green box highlights a set of icons (mail, print, PDF) for document conversion. A blue box highlights the 'Join the CTPG Mailing List' form, which includes fields for Name and Email, a 'Subscribe' dropdown menu, and a 'SUBMIT' button. Below the form is a 'Privacy Policy | User Agreement' link and a 'Quick Links' section with a list of external organizations: Federal Energy Regulatory Commission (FERC), North American Electric Reliability Corporation (NERC), Western Electricity Coordinating Council (WECC), California Renewable Portfolio Standard (RPS), and Renewable Energy Transmission Initiative (RETI).

Re-designed Menus and Helpful Links

E-mail, Print, and/or PDF Conversion

Frequently Asked Questions

Archived Old Postings

Study Work

- CTPG issued its first conceptual 2010 statewide transmission plan in February, 2011.
 - The 2010 state-wide transmission plan identified transmission needs that would meet an RPS of approximately 24% by 2020.

- 2011 Study Work

Study Work

- Study Cases

- WECC's 2020 HS and 2018 HSPR cases to be updated to reflect 2020 summer, spring and fall conditions (pre-renewable)
- Cases will be adjusted as appropriate to reflect the 9 renewable resource scenarios (i.e. model renewable generation and associated transmission, and stress key paths as indicated)

- Studies involve

- Power flow studies--500 kV + other lower voltage outages
- Stability studies for select outages
- Identify problems and test potential solutions
- Tabulate results

Verify Modeling of Existing Renewables

- Objectives

- Determine if the WECC Seed Cases accurately reflect the types, amounts, and locations of existing renewable energy resources (those in service at the end of 2010)
- Modify the Seed Cases as required to add any “un-modeled” resources

- Approach

- The most recent version of the CEC QFER data base regarding existing resources in-service as of December 2010 was reviewed
- A spreadsheet summarizing information on these units was sent to CTPG for review so as to identify the pertinent interconnection point and installed capacity for each unit

NET SHORT UPDATE

“CEC IEPR HIGHEST FORECAST”

GWH 305,256 **2020 CEC Energy Demand Forecast (May 2011)**

Energy not subject to RPS

3,320 Central Valley Project Pump Load

1,507 Metropolitan Water District Pump Load

8,729 Department of Water Resources Pump Load

15,200 Energy Efficiency

2,336 Private Photovoltaic

- Combined Heat and Power

274,164 **Retail sales subject to RPS**

90,474 **Renewable Generation Requirement (33%)**

43,500 Existing Renewables

46,974 **CEC Staff Renewable Net Short**

CPUC Approved Solar PV Program

876 SCE

91 SDG&E

876 PG&E

45,131 **CTPG Renewable Net Short**

STUDY SCENARIOS

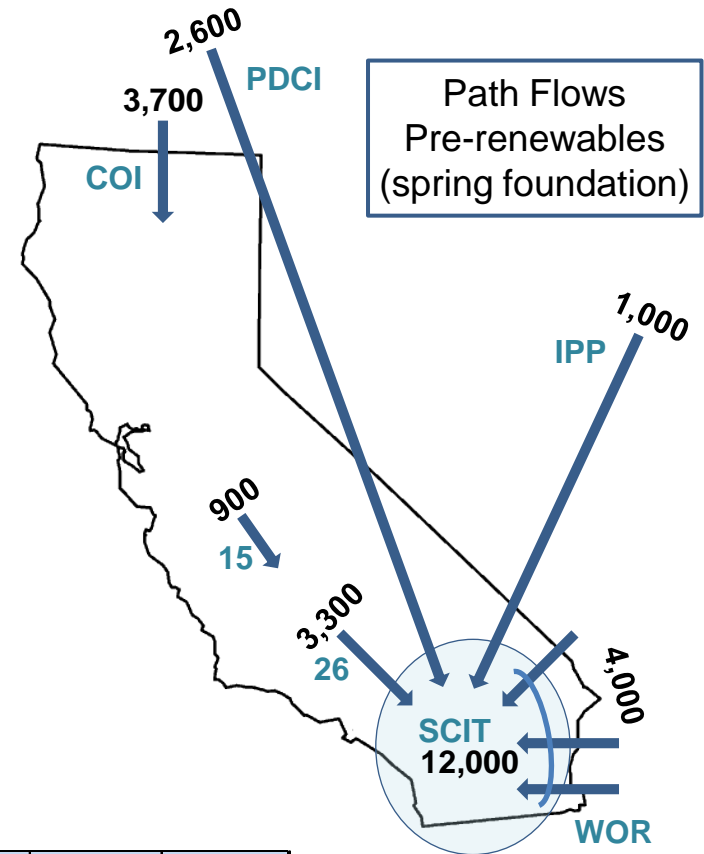
No.	Name	Description	Path Flow Pre-Renewables	Renewable Resources	Season Date Time	Net Short (TWH)	Responsible CTPG Member
1	Pacific Northwest Import	Wind imports from Pacific Northwest combined with hydro runoff.	stress COI (n-s)	Out of State CPUC/POU discounted core RETI Best CREZs	spring (May)	45.1	TANC
2			foundation				
3	Northwest Nevada Import	Geothermal and solar from Nevada and wind from Northern California with delivery to new substation and generation tie line.	stress COI (n-s)	Out of State CPUC/POU discounted core RETI Best CREZs	summer peak	45.1	SMUD
4			foundation				
5	South to North Flow	Determine transmission needs required during this time period generally characterized as light load with significant wind and morning solar generation.	Paths 15 & 26 (s-n)	Southern California CPUC/POU discounted core RETI Best CREZs	fall (Sep 9 AM)	45.1	TID
6	CPUC Public Policy	Updates cost constrained scenario: includes Eldorado-Ivanpah, 1,384 MW of DG, 25% of 2020 RPS is out of state and projects from CAISO 2010/11 Transmission Plan.	foundation	CPUC/POU discounted core CPUC Public Policy	summer peak	45.1	SDG&E
7	Central California	Large development of disturbed land with low environmental impact.	foundation	CPUC/POU discounted core Central California gen queue RETI Best CREZs	summer peak	45.1	PG&E
8	West of River Import	High wind & solar imports from Wyoming, Utah, Nevada and Arizona to stress WOR. Inject power at Eldorado (50%), Palo Verde (37%) and N. Gila (13%).	stress WOR (e-w) Paths 15 & 26 (s-n)	Out of State CPUC/POU discounted core RETI Best CREZs	fall (Sep 9 AM)	45.1	SCE
9		Same as Scenario 10, except inject power at Eldorado (37%), Palo Verde (50%) and N. Gila (13%).					

1 & 2. Pacific Northwest Import

- Increased import from Pacific Northwest
 - 2,000 MW of wind shaped by hydro at 50% capacity
 - approximately 80% capacity for large hydro
- Load: 2020 spring 48,518 MW
approximately 65% of summer peak
- Path flows pre-renewables:
 - Scenario 1. stress COI (4,800 n-s) & PDCI (3,100 n-s)
 - Scenario 2. spring foundation
- Net Short renewable resources:

	GWh	%
Discounted Core	25,138	56
Scenario Specific	8,804	19
RETI Best CA CREZs	11,189	25
Total	45,131	

	Wind	Solar Thermal	Solar PV	Bio Sm Hydro	Geo	Total
Installed Capacity (MW)	6,774	5,055	3,115	200	340	15,483
Disptached (MW)	TBD	TBD	TBD	TBD	TBD	TBD
Annual Energy (GWh)	22,272	11,939	6,881	1,479	2,561	45,131



RE-DISPATCH APPROACH

- Fossil generation will be decreased in a merit-order fashion (least economic reduced first) across WECC
- Use heat rate data from WECC Transmission Expansion Planning & Policy Committee's 2017 economic database
- Decrements will be limited to levels above known local capacity requirements as identified by the applicable balancing authority
- CTPG has issued a survey to transmission planning entities throughout WECC to identify
 - Dispatchable generators
 - Obtain minimum output of dispatchable units
 - Constraints requiring specific dispatchable units to be on line

CTPG SURVEY OF WECC ENTITIES

Dispatchable Generation & Local Reliability Requirements

Entities Who Have Responded

Salt River Project (Arizona)
NV Energy (southern Nevada)
Metropolitan Water District
California Department of Water Resources
Southern California Edison Company
Public Service Company of New Mexico
SDG&E
LADWP
Modesto Irrigation District
Turlock Irrigation District
NV Energy (northern Nevada)
Bonneville Power Administration
Northwestern Energy (Montana)
Idaho Power Company
SMUD
British Columbia Hydro and Power Authority
Alberta
Avista
Portland General Electric
Puget Sound Energy
Pacific Gas & Electric Company
Portland General Electric
NW Montana
Comision Federal de Electricidad
Imperial Irrigation District
WAPA and USBR

Entities Who Have Not Responded

WECC TEPPC
Arizona Public Service
Farmington Electric Utility System
Public Service Company of Colorado
Colorado Springs Utilities
El Paso Electric Company (WECC portion)
Utah Municipal Power Agency
Tri-State Generation & Transmission Association
Black Hills Power
Southwest Transmission Cooperative
Platte River Authority
Deseret Generation & Transmission Co-operative
Basin Electric Power Cooperative
PacificCorp
FortisBC
Aquila Networks
Seattle City Light
Tacoma Power
City and County of San Francisco – Hetch Hetchy W & P
Tucson Electric Power

WECC INSTALLED CAPACITY DISPATCHABLE GAS-FIRED GENERATION CAISO "HYBRID" RPS CASE

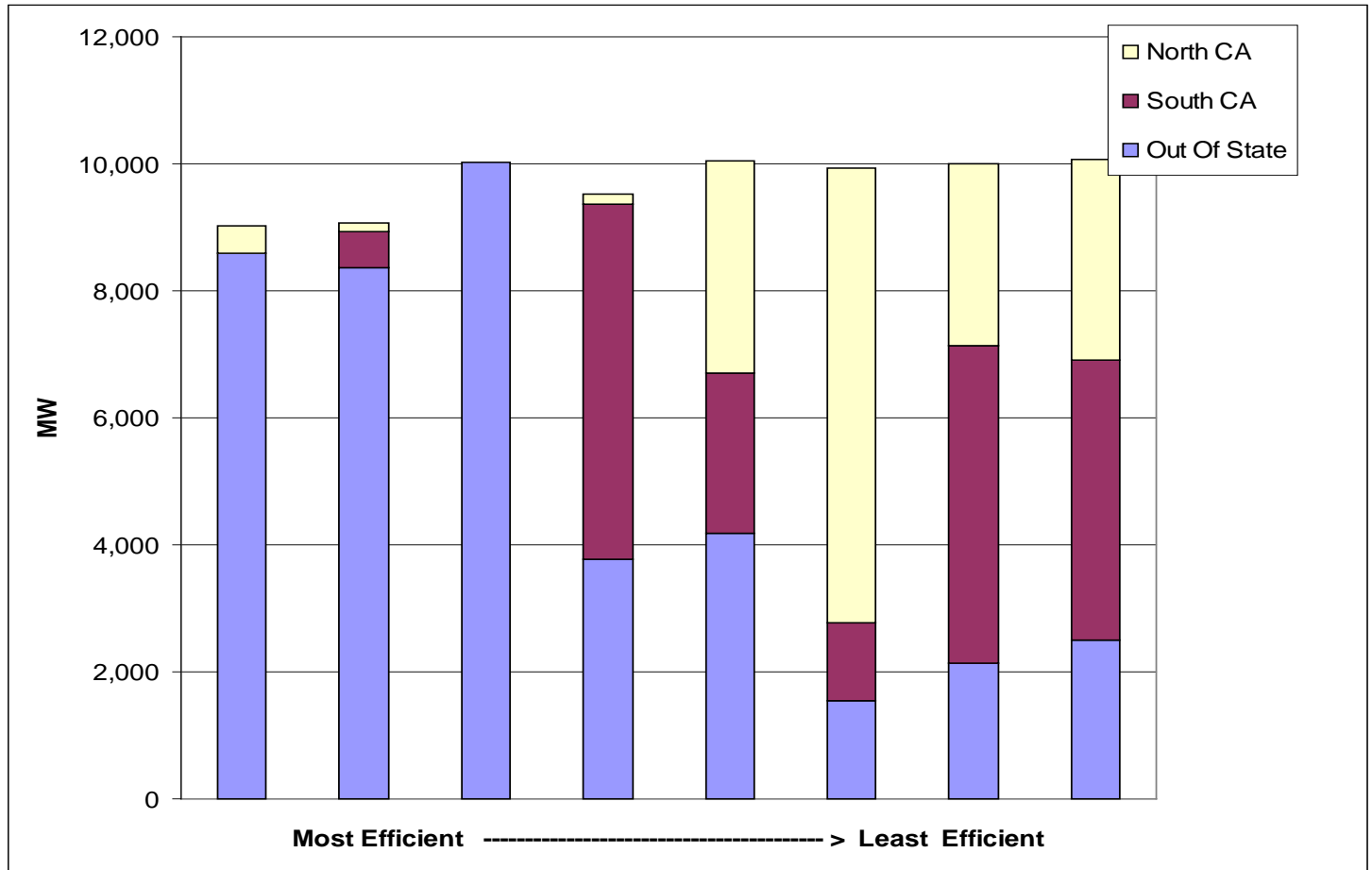
NOTES:

- CAISO Hybrid RPS Case commits 62,616 MW for 4pm PST on July 22, 2020

- Reflects CAISO assumptions for OTC units (different than CTPG)

- Reflects survey results for dispatchable generation

- On-going refinements

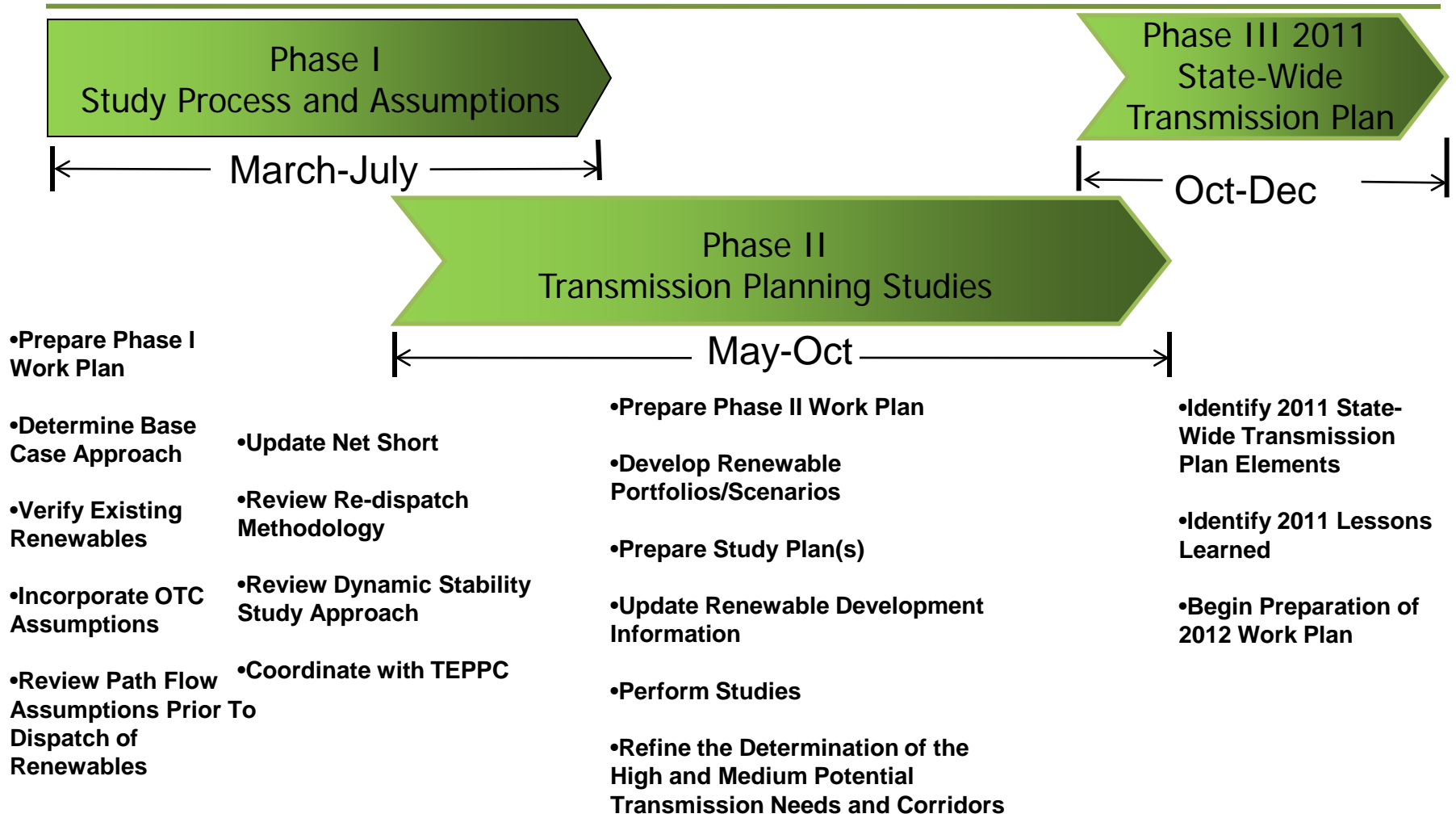


CTPG Study Work

Path Flow Assumptions

- Objectives:
 - Evaluate system performance under stressed system conditions (ensure grid reliability)
 - Evaluate system performance under more probable system conditions (support project approval processes)
- Approach:
 - Set-up two sets of base cases
 - ✓ Pre-renewable base cases where WECC seed case modified to stress selected paths (stressed cases)
 - ✓ Pre-renewable base cases where WECC seed case largely unmodified (foundational cases)
 - Add renewables to meet 33% RPS requirement
 - Identify reliability criteria violations and transmission infrastructure mitigating violations
- Setting Path Flows in Stressed Cases
 - Select paths to be stressed
 - Adopt target path flow level
 - Modify generation dispatch in WECC seed case to effect desired target path flow level
 - Modified WECC seed case becomes pre-renewable base case for stressed cases

CTPG 2011 WORK PLAN



FERC Order 1000

- Requires Public Utility Transmission Providers to:
 - Develop and participate in a regional planning process that produces a regional plan
 - Consider state and federal public policy requirements in transmission planning processes
 - Develop regional cost allocation methods for transmission projects selected in regional transmission plans
 - Coordinate with each neighboring planning region to develop procedures for coordination of planning and cost allocation for interregional transmission projects

- What does it mean to CTPG?

Questions
