Agenda
Reliability Assessment and Study Updates

Isabella Nicosia
Senior Stakeholder Engagement and Policy Specialist

2023-2024 Transmission Planning Process Stakeholder Meeting
September 26-27, 2023

2023-2024 Transmission Planning Process Stakeholder Call – Agenda

Topic	Presenter
Day 1 – September 26	
Overview & Key Issues	Binaya Shrestha
Reliability Assessment – North	RTN - Engineers
Reliability Assessment - South	RTS - Engineers
Day 2 – September 27	
PTO Proposed Reliability Solutions	SDG&E, PG&E, SCE, GLW
High Voltage TAC Update	Binaya Shrestha
Policy Assessment - Update	Lindsey Thomas
Economic Assessment - Update	Yi Zhang
20-Year Transmission Outlook - Update	Ebrahim Rahimi

Transmission Program Impact on High Voltage TAC
Estimating Model – 2022-2023 TPP Version

Binaya Shrestha
Manager - Regional Transmission North

2022-23 Transmission Planning Process Stakeholder Meeting
September 26-27, 2023

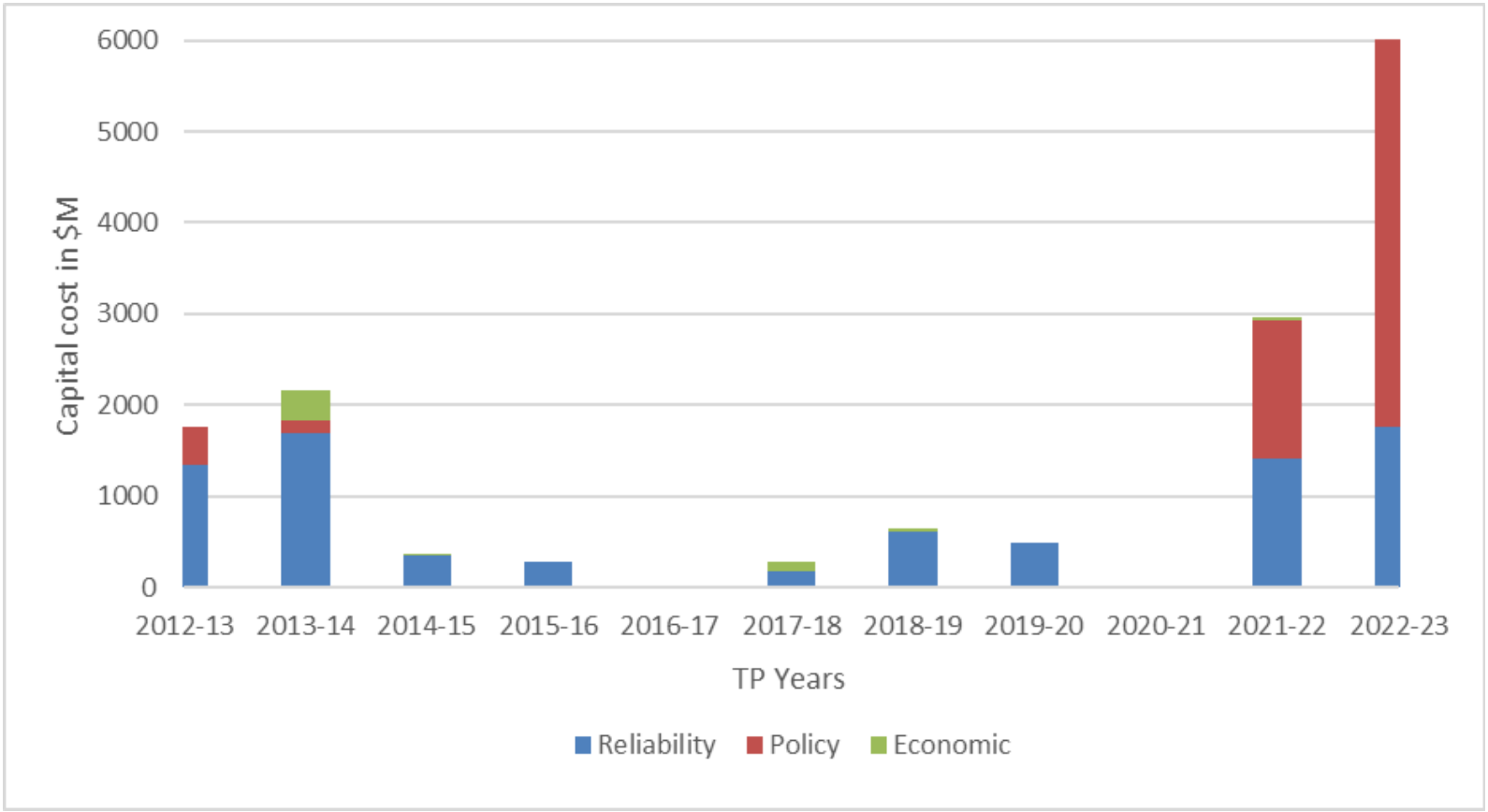
Background

- Forecasting tool developed for the 2012-2013 Transmission Plan in response to concerns over increasing upward pressure on transmission costs.
  - Replacing aging infrastructure
  - Complying with NERC planning standards
  - Meeting California energy policy goals
- Goal is to estimate future high voltage transmission access costs in an objective and transparent manner.
  - Strike a balance of top down estimates with bottom up details
  - Provides transparency to costs related to reliability, policy, and economic driven projects
  - Establish a baseline and allows the flexibility to customize each future project individually
  - Is not a precise forecast of any individual PTO's revenue requirement or any individual project's revenue requirement

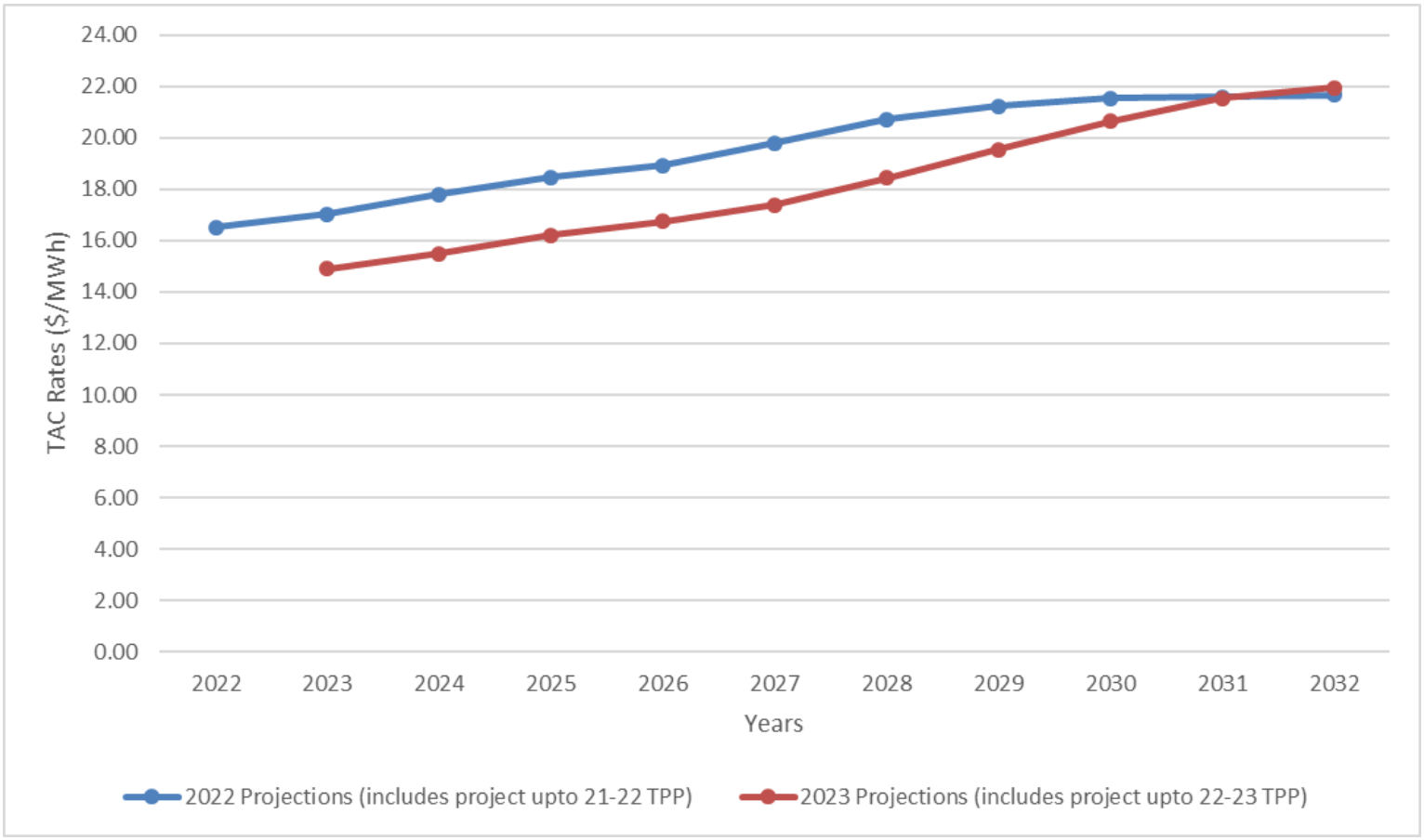
Model and modeling assumptions essentially unchanged from previous years:

- O&M costs escalated at 2% per year.
- Non-ISO capital estimated at 2% of gross plant per year
- “Typical” return and depreciation rates applied.

Comparison of capital projects approved in the 2022-2023 plan and ten previous years:



Regional high voltage transmission access charge projection trended from January 1, 2023 values:



* Existing returns are maintained for existing PTO rate base, and 11% return on equity is assumed for new transmission capital.

Compared to the 2021-2022 model:

- The 2022-2023 projections are lower than 2021-2022 projections which is primarily attributable to:
  - The gross load growth updated to 1% from -0.05% in past cycle
  - decrease of $2.01 from last year's projection for January 1, 2023 to this year's actuals reflects the decrease in Transmission Revenue Balancing Account Adjustments (TRBAA) and Standby Credit contribution below the historical projections
- The trend of the 2023 TAC value for the 2023 projection remains relatively consistent with the 2022 projection.
- The projection also includes capital projects in 2022-2023 plan and all other transmission plan projects not already energized.

Next Steps

- Continue to refine assumptions and costs based on comments received for use in the 2023-2024 transmission plan
- Provide incremental annual updates as part of the annual transmission planning process
- Please submit your comments through the ISO's commenting tool, using the template provided on the process webpage: https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses

Policy-driven Assessment Updates

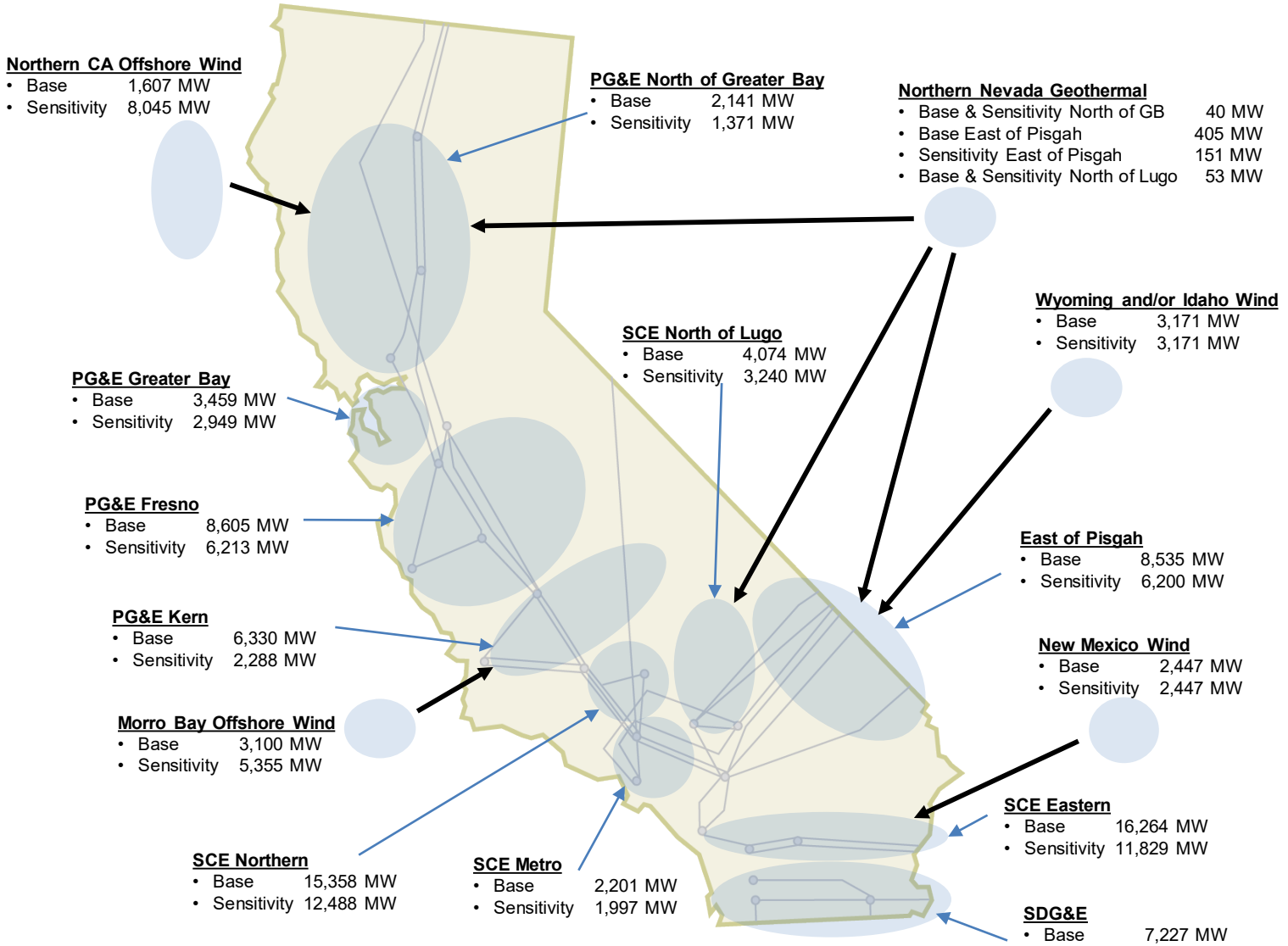
Lindsey Thomas
Senior Regional Transmission Engineer

2023-2024 Transmission Planning Process Stakeholder Meeting
September 26-27, 2023

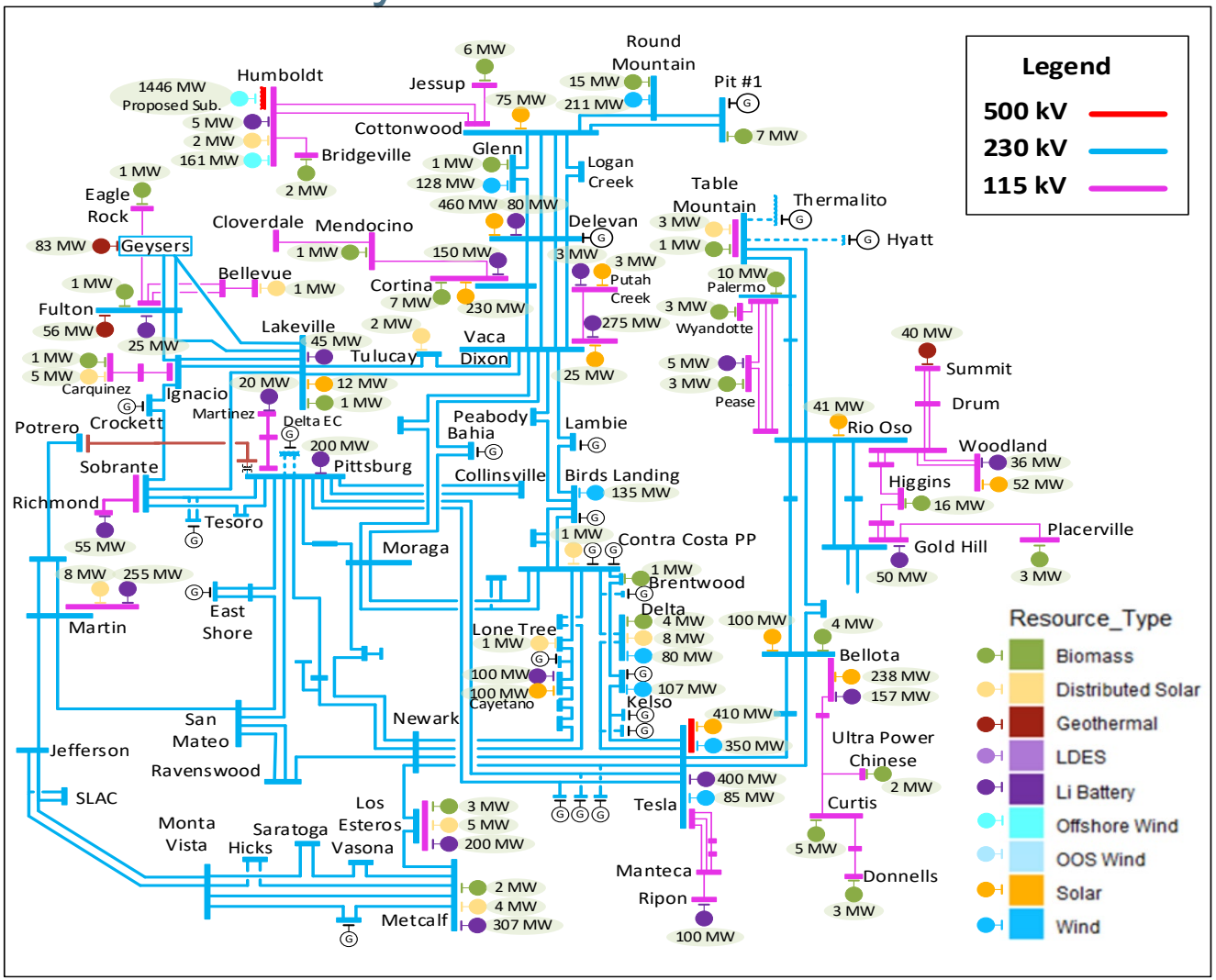
Introduction

- In February, we presented the study plan for the policy-driven assessment including its scope, an overview of the resource portfolios to be studied and the assessment methodology
- In this update, we provide
  - Detailed transmission diagrams for each interconnection area showing portfolio resource locations, amounts and types
  - Minor Post Decision additions and modifications made per D.23-02-040 or the TPP Study Plan
  - MIC expansion requests being assessed
  - Updated HSN and SSN output assumptions for OSW
  - Scope of the OSW sensitivity portfolio assessment

2023-2024 TPP Base and OSW Portfolios (2035)



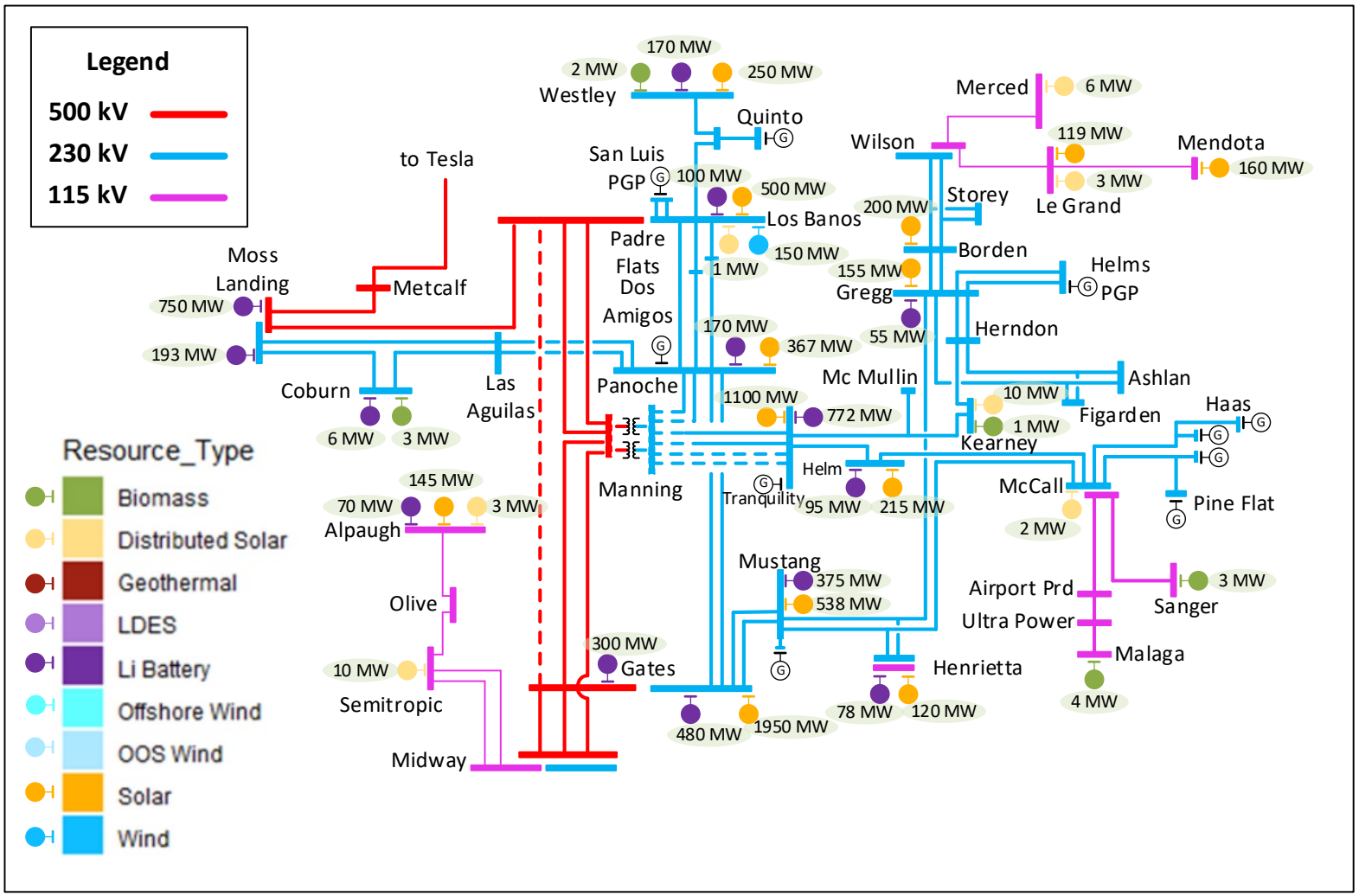
Base Portfolio: PG&E Greater Bay and North of Greater Bay Areas



FCDS
5,841
MW

Total
7,247
MW

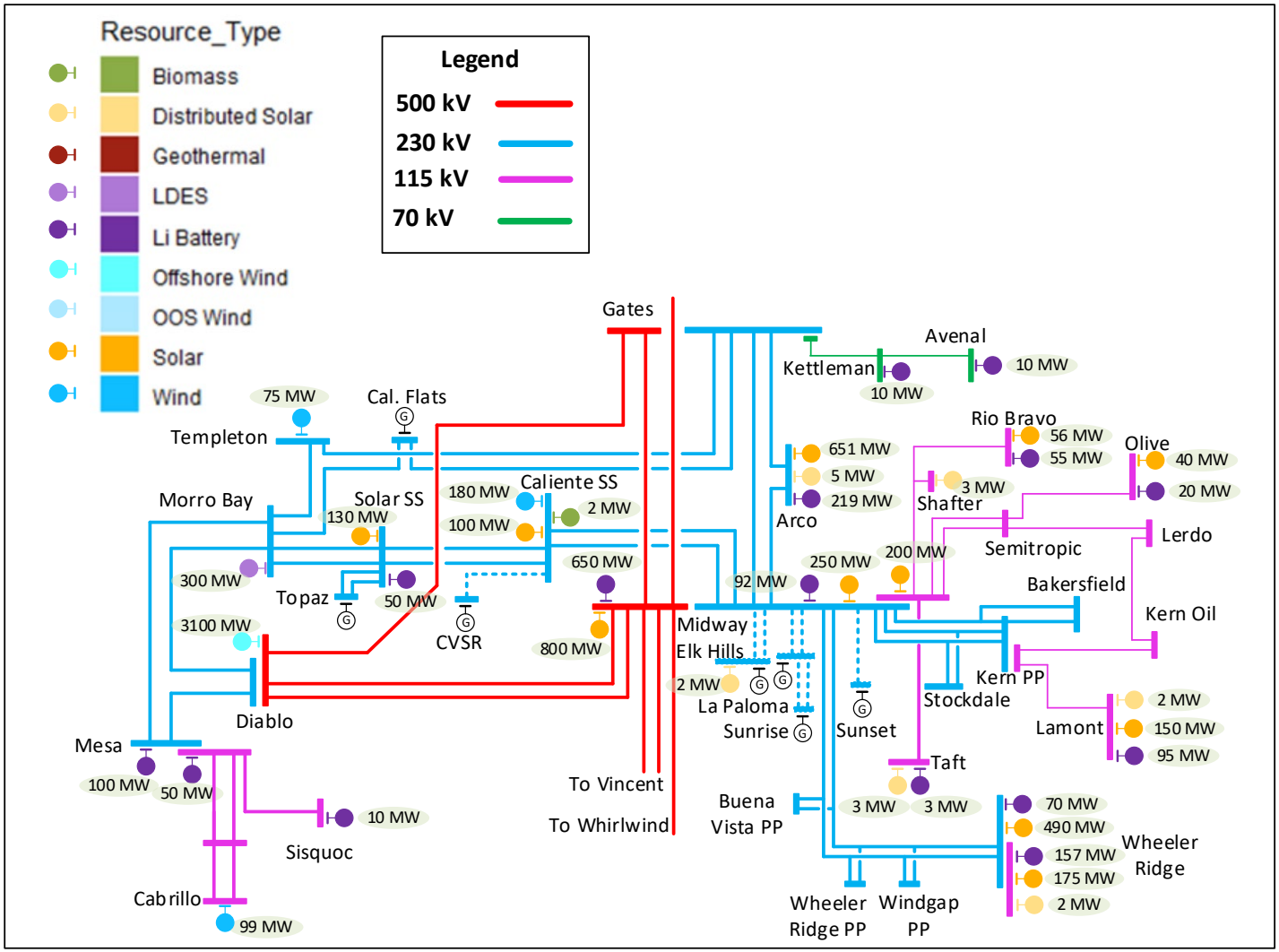
Base Portfolio: PG&E Fresno Area



FCDS
6,241
MW

Total
8,605
MW

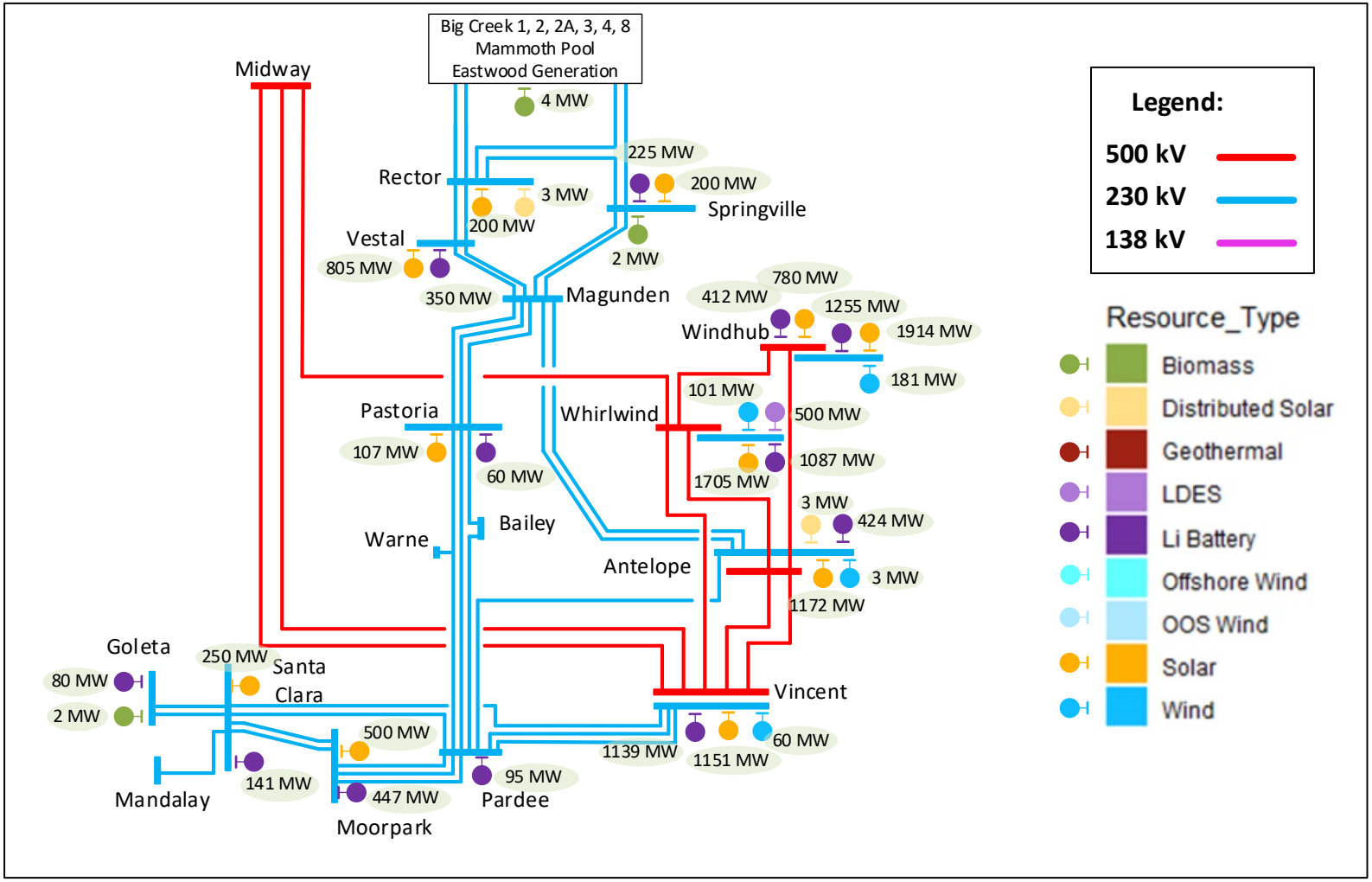
Base Portfolio: PG&E Kern Area



FCDS
7,056
MW

Total
9,430
MW

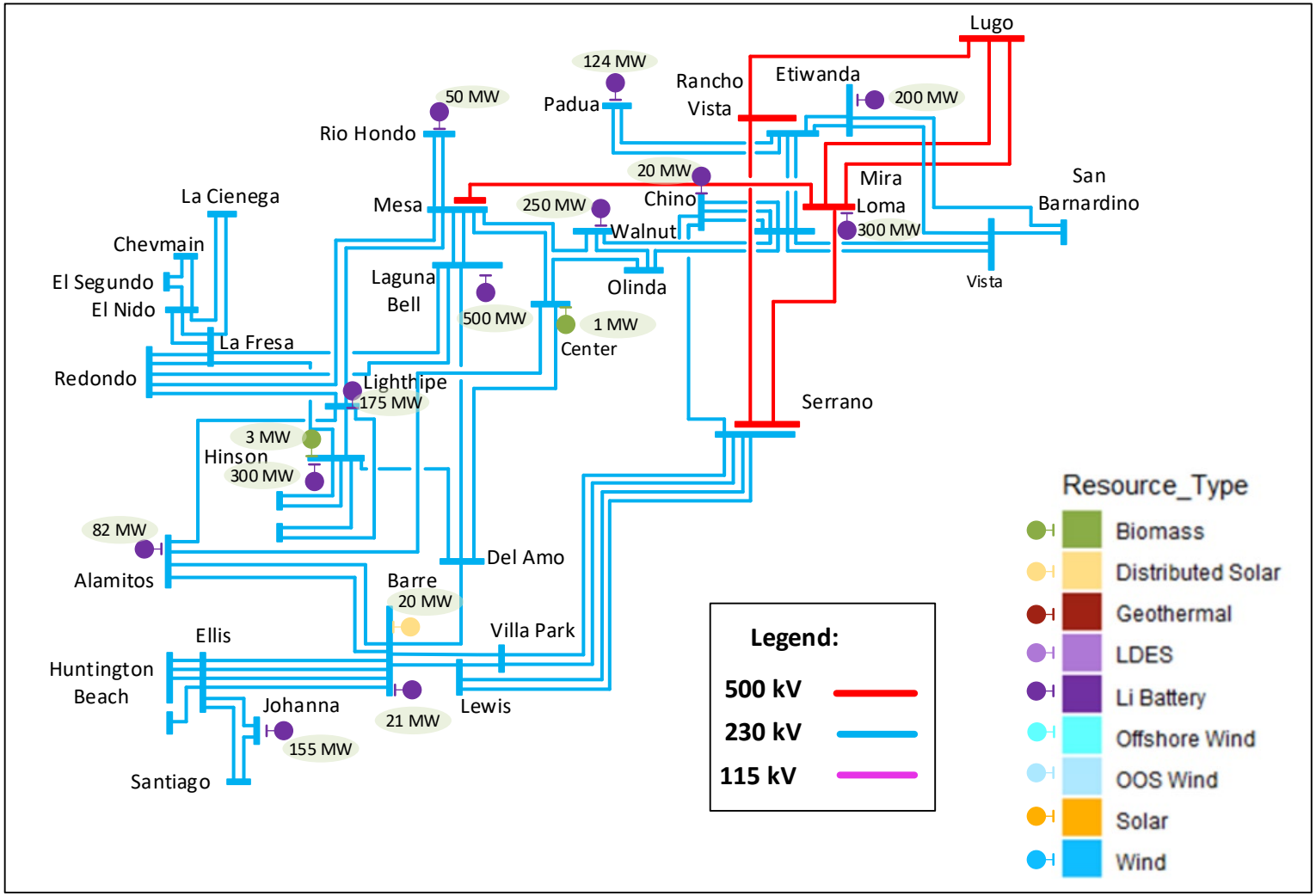
Base Portfolio: SCE Northern Area



FCDS
10,336
MW

Total
15,358
MW

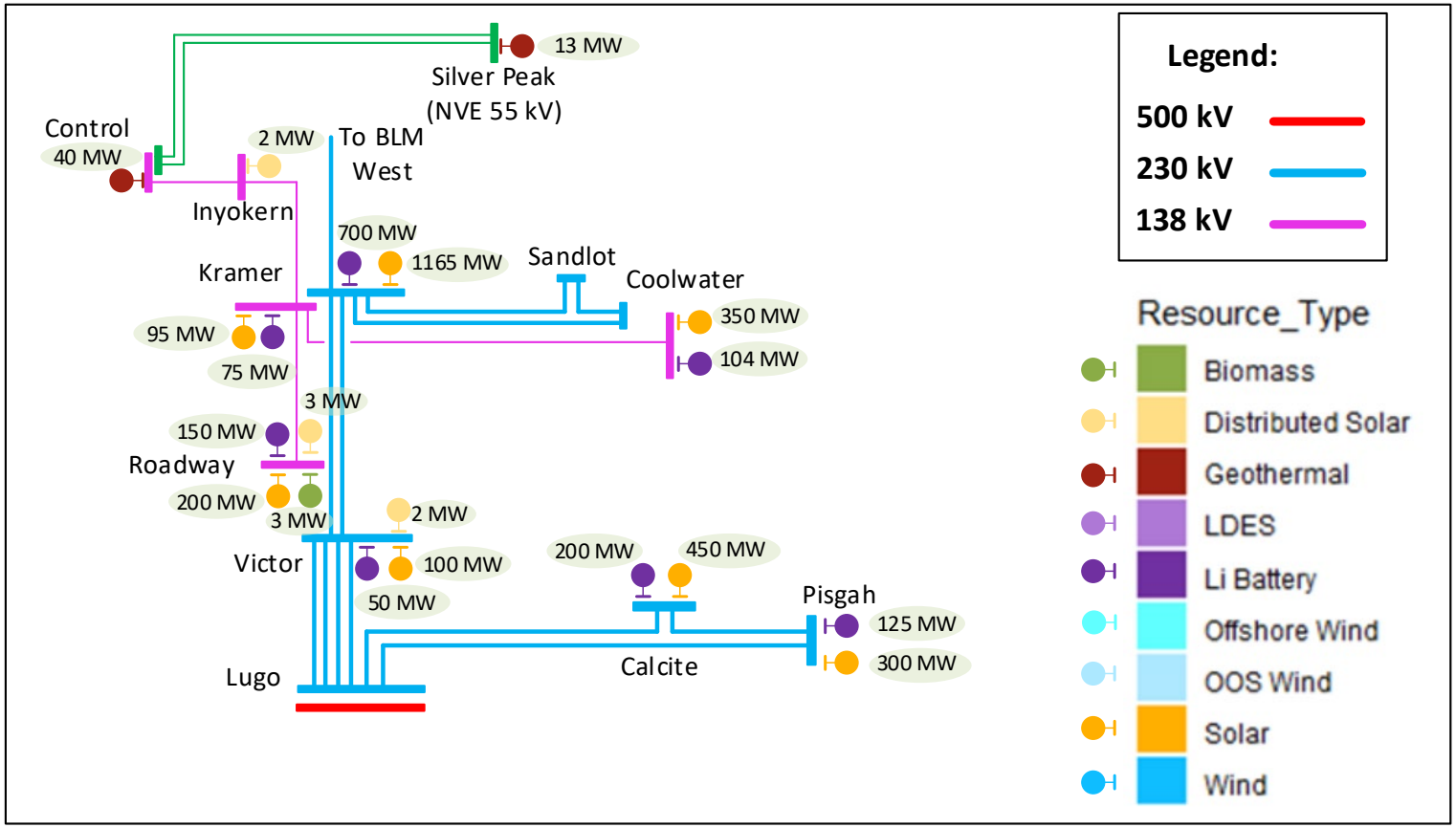
Base Portfolio: SCE Metro Area



FCDS
2,201
MW

Total
2,201
MW

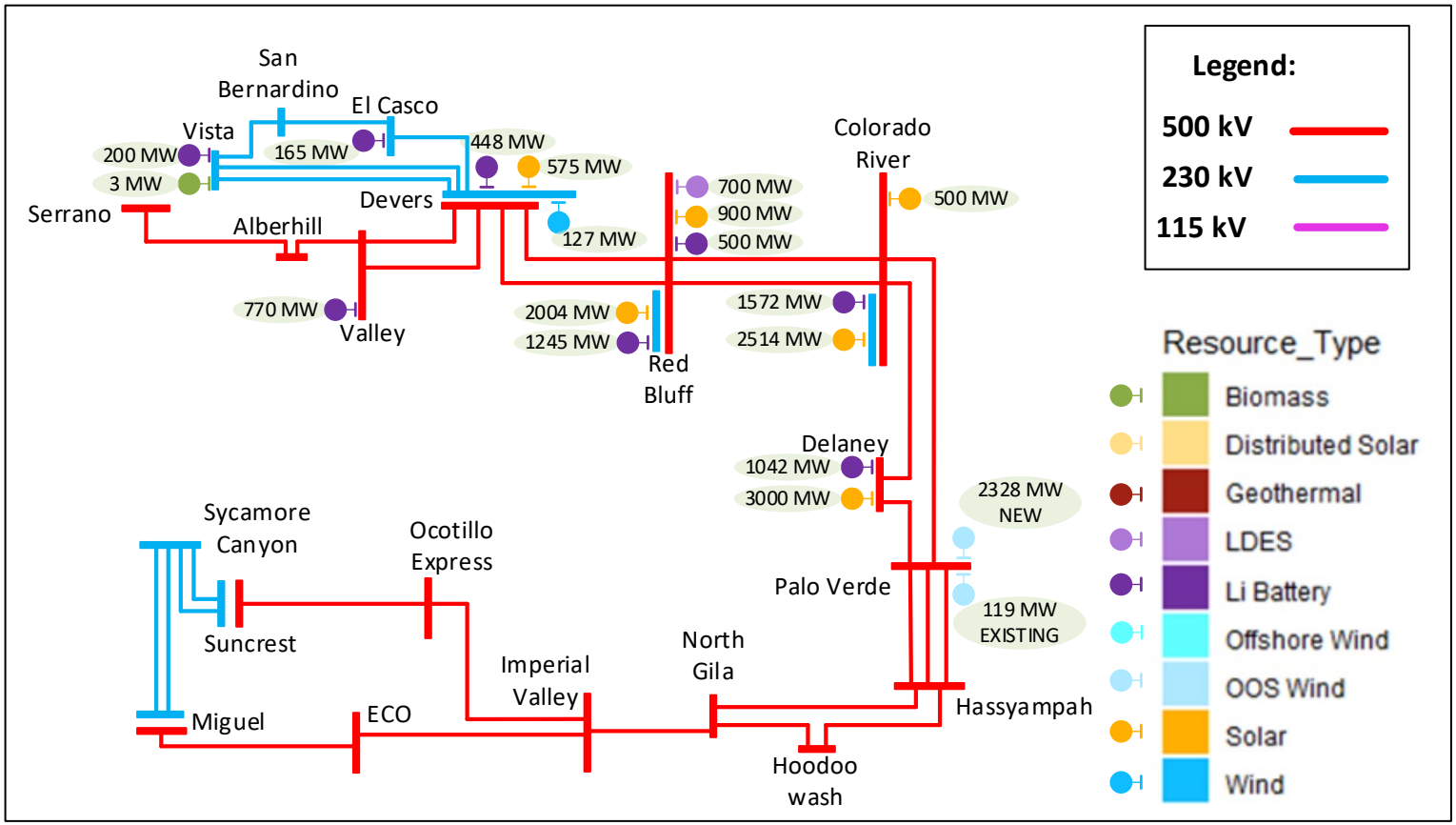
Base Portfolio: SCE North of Lugo Area



FCDS
2,777
MW

Total
4,127
MW

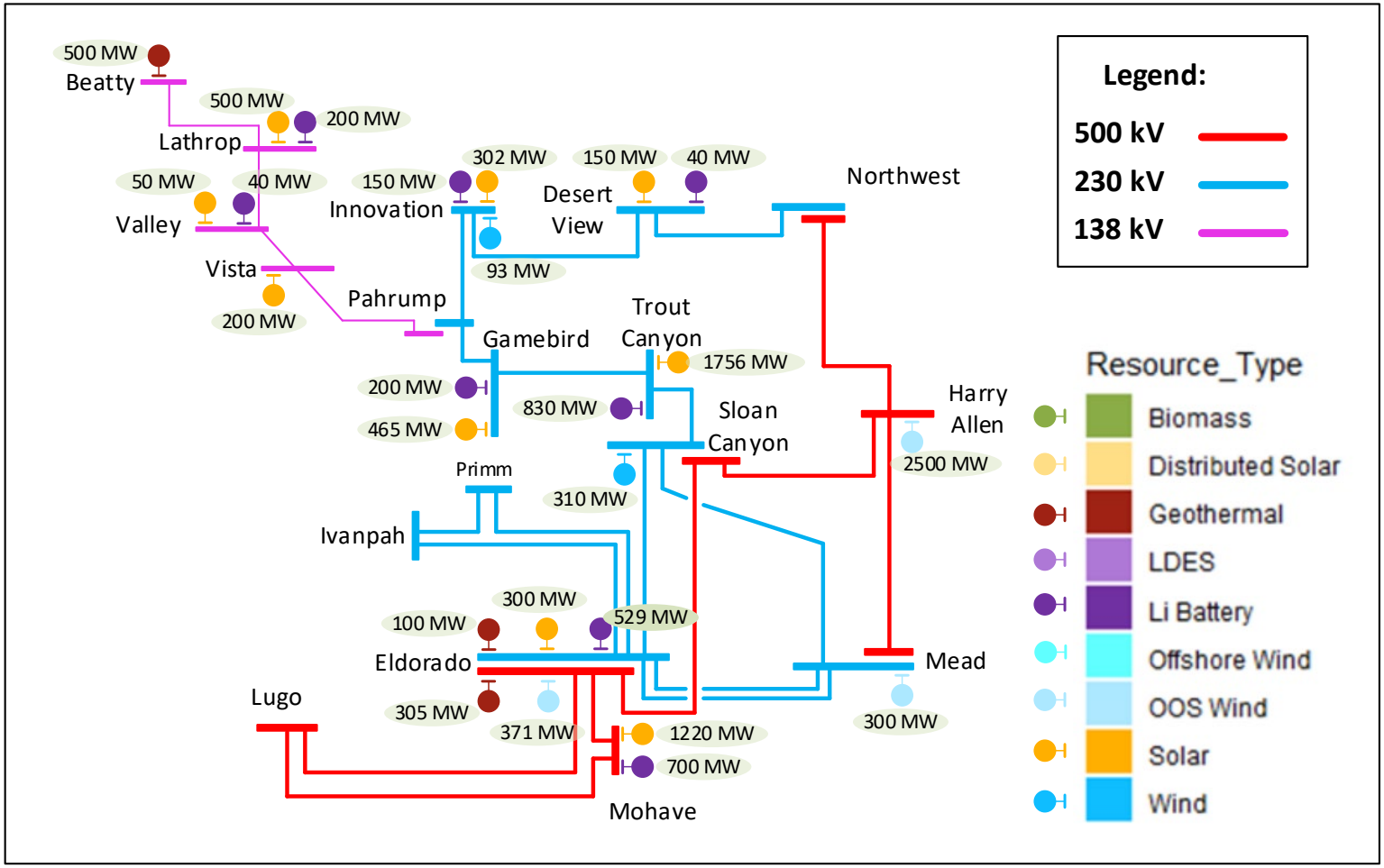
Base Portfolio: SCE Eastern Area



FCDS
12,128 MW

Total
18,711 MW

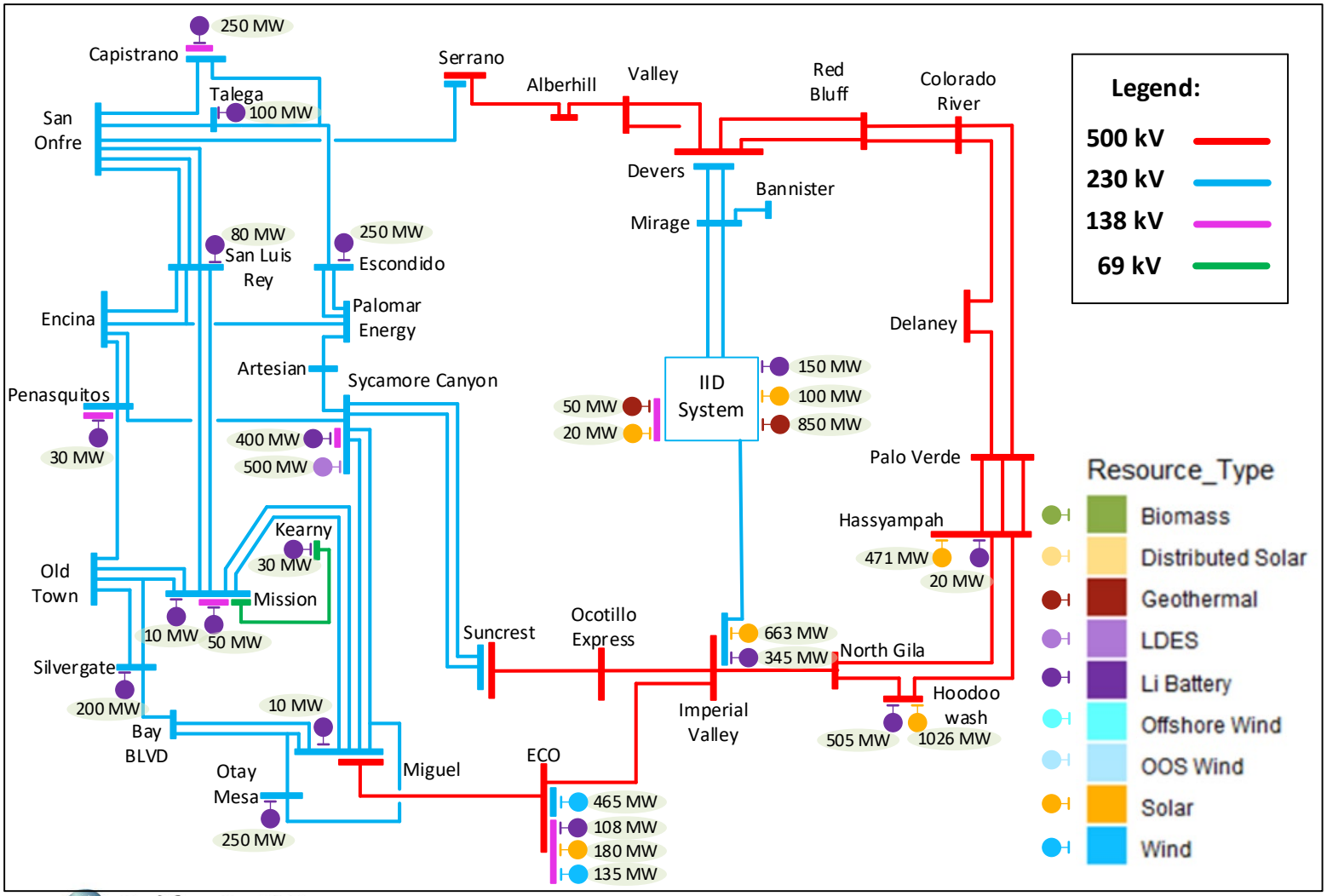
Base Portfolio: East of Pisgah Area



FCDS
9,225
MW

Total
12,111
MW

Base Portfolio: SDG&E Area



FCDS
5,077
MW

Total
7,227
MW

Unaccounted for TPD allocation identified for inclusion

- CPUC staff identified a total of 477 MW of FCDS resources to account for TPD that were previously not accounted for by the portfolios in the key areas defined in D.23-02-040[1].
- These resources will be modeled in the on-peak deliverability assessment.

Unaccounted for TPD allocation recommended for inclusion in TPP analysis				Key Unaccounted TPD Amount		
Transmission Area	CAISO Substation	Voltage	Resource Type	FCDS (MW)	EODS (MW)	Total (MW)
SCE Eastern Study Area	Delaney	500	Storage	102.0	-	102.0
SDG&E Study Area	Hoodoo Wash	500	Storage	42.5	-	42.5
East of Pisgah Study Area	Ivanpah	230	Storage	200.0	-	200.0
East of Pisgah Study Area	Mohave	500	Storage	120.0	-	120.0
SCE Eastern Study Area	Redbluff	230	Storage	12.5	-	12.5
			Total	**477.0**	**-**	**477.0**

1 https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/busbardashboard2035_30mmt_hebase_vd2_08-11-23.xlsx

Post Decision adjustments to account for additional in-development resources identified per the ISO Study Plan

Post Decision adjustments to account for CAISO identified additional In-Development Resources				Decision: Base Portfolio Total Resources (2035)			Post Decision Adjustments to Total Resources			Updated 23-24 TPP 30 MMT High Electrification Base Portfolio Total Resources (2035)		
Transmission Area	CAISO Substation	Voltage	Resource Type	FCDS (MW)	EODS (MW)	Total (MW)	FCDS (MW)	EODS (MW)	Total (MW)	FCDS (MW)	EODS (MW)	Total (MW)
SCE Northern Area	Windhub	500	Li_Battery	412	-	412	(412)	-	(412)	-	-	-
SCE Northern Area	Windhub	230	Li_Battery	1,255	-	1,255	412	-	412	1,667	-	1,667
SCE Northern Area	Windhub	500	Solar	780	-	780	-	-	-	780	-	780
SCE Northern Area	Windhub	230	Solar	846	1,068	1,914	-	-	-	846	1,068	1,914
				3,293	**1,068**	**4,361**	**-**	**-**	**-**	**3,293**	**1,068**	**4,361**

- The adjustment does not alter the total portfolio amount

1 https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/busbardashboard2035_30mmt_hebase_vd2_08-11-23.xlsx

MIC expansion requests being assessed

No.	Requestor Name	Intertie Name (Scheduling Point)	MW quantity	Resource type
1-2	San Diego Community Power	ELDORADO_ITC (WILLOWBEACH)	90	Wind
3-5	Valley Electric Association	MEAD_ITC (MEAD 230)	33	Hydro
6			90	Hybrid (Solar/Battery)
7-8	Southern California Edison	BLYTHE_ITC (BLYTHE161)	7	Hydro
9	Cal Choice Energy Authority Clean Energy Alliance Desert Energy Community	IPPDCADLN_ITC (IPP & IPPUTAH)	20	Geothermal
10	Clean Power Alliance	IPPDCADLN_ITC (IPP & IPPUTAH)	33	Geothermal
11	California Community Power	SUMMIT_ITC (SUMMIT120) *	39	Geothermal
		SILVERPK_BG (SILVERPEAK55) *		

* = As back-up locations only – main delivery point included as GONDIPPDC_ITC (GONIPP) and part of the CPUC portfolio

Updated HSN and SSN output assumptions for OSW

- The ISO previously established and used 100% as the output assumption for OSW for the HSN scenario. For the SSN scenario the values established were 53% for Humboldt call area and 49% for Morro Bay.
- As communicated to stakeholders during the August 16 meeting on the 20-Year Outlook and OSW, the ISO has performed analysis based on updated wind generation estimates provided by NREL.
- The data analysis indicated that the average offshore wind generation is 83% of installed capacity for HSN hours and 45% for SSN hours.
- These average values are being used in the current policy-driven assessment.

Scope of the OSW sensitivity portfolio assessment

- The objective of the OSW sensitivity portfolio is to assess the transmission needs associated with a large amount of OSW resources with all of the POIs located in the PG&E area.
- Because of the large amount of OSW in the PG&E area, the amount of resources in southern California in the sensitivity portfolio is less than the base portfolio.
- For these reasons, PG&E area will be the focus of the OSW sensitivity portfolio assessment.

Next steps

- Preliminary results of the policy-driven assessment will be presented at the November 16 stakeholder meeting

Economic Assessment Assumption Update for 2023-2024 Planning Cycle

Yi Zhang

2023-2024 Transmission Planning Process Stakeholder Meeting
September 26-27, 2023

Key assumptions and inputs for the ISO PCM development in 2023-2024 cycle

- Start with the CAISO 2022-2023 PCM and the ADS 2032 PCM v2.3, with following changes
  - Using the ISO TPP 2035 summer peak bulk power flow case for policy study
    - Update CAISO system transmission topology
    - Update load and load modifiers allocation
  - CEC 2035 load forecasts for California BAAs load
  - CPUC IPR 2035 portfolios for California ISO renewable and battery

Two PCM cases in this TPP cycle

- Base PCM
  - CEC 2035 mid-AAEE high electrification load forecast
  - CPUC base portfolio
- Sensitivity PCM
  - CEC 2035 mid-AAEE high electrification load forecast
  - CPUC sensitivity portfolio

Current status and next step

- The CAISO is developing the planning PCM cases
- Will present preliminary results in the November stakeholder meeting

20 Year Transmission Outlook
Status Update

Ebrahim Rahimi
Sr. Advisor - Transmission Infrastructure Planning

2023-2024 Transmission Planning Process Stakeholder Meeting
September 26-27, 2023

CEC Docketed - 2045 Scenario for the Update of the 20-Year Transmission Outlook

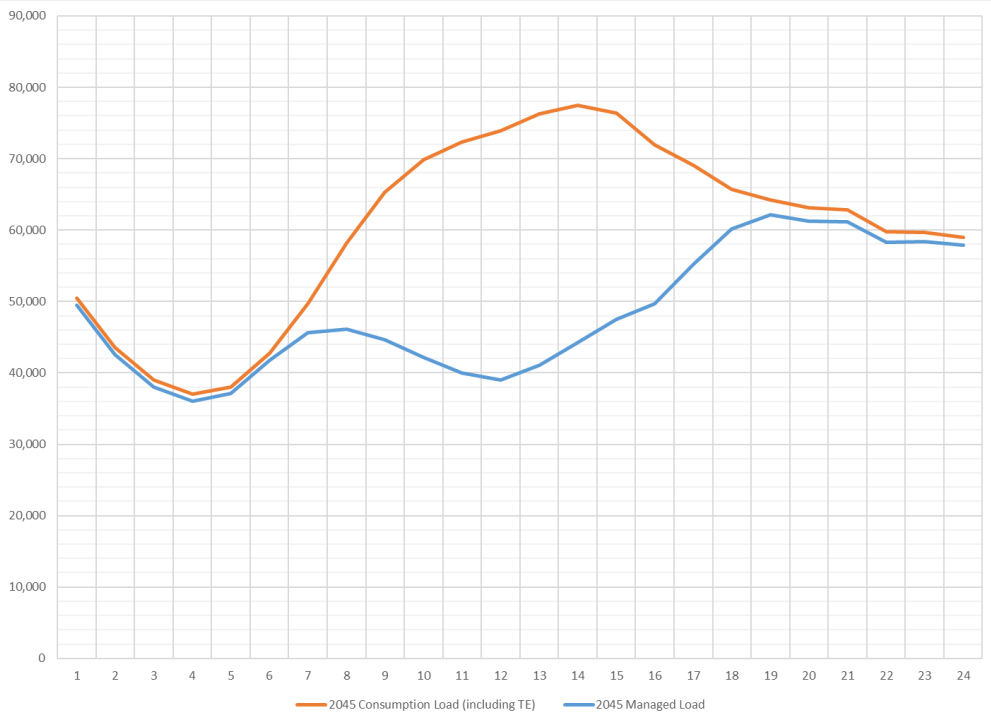
"The 2045 Scenario for the Update of the 20-Year Transmission Outlook staff paper describes a 2045 demand and resource scenario for use by the California Independent System Operator (California ISO) in the update of the 20-Year Transmission Outlook. The staff paper outlines the demand and resource assumptions within the scenario. The staff paper details the method for resource mapping the new renewable resource and energy storage capacity within the scenario."

https://www.energy.ca.gov/publications/2023/2045-scenario-update-20-year-transmission-outlook

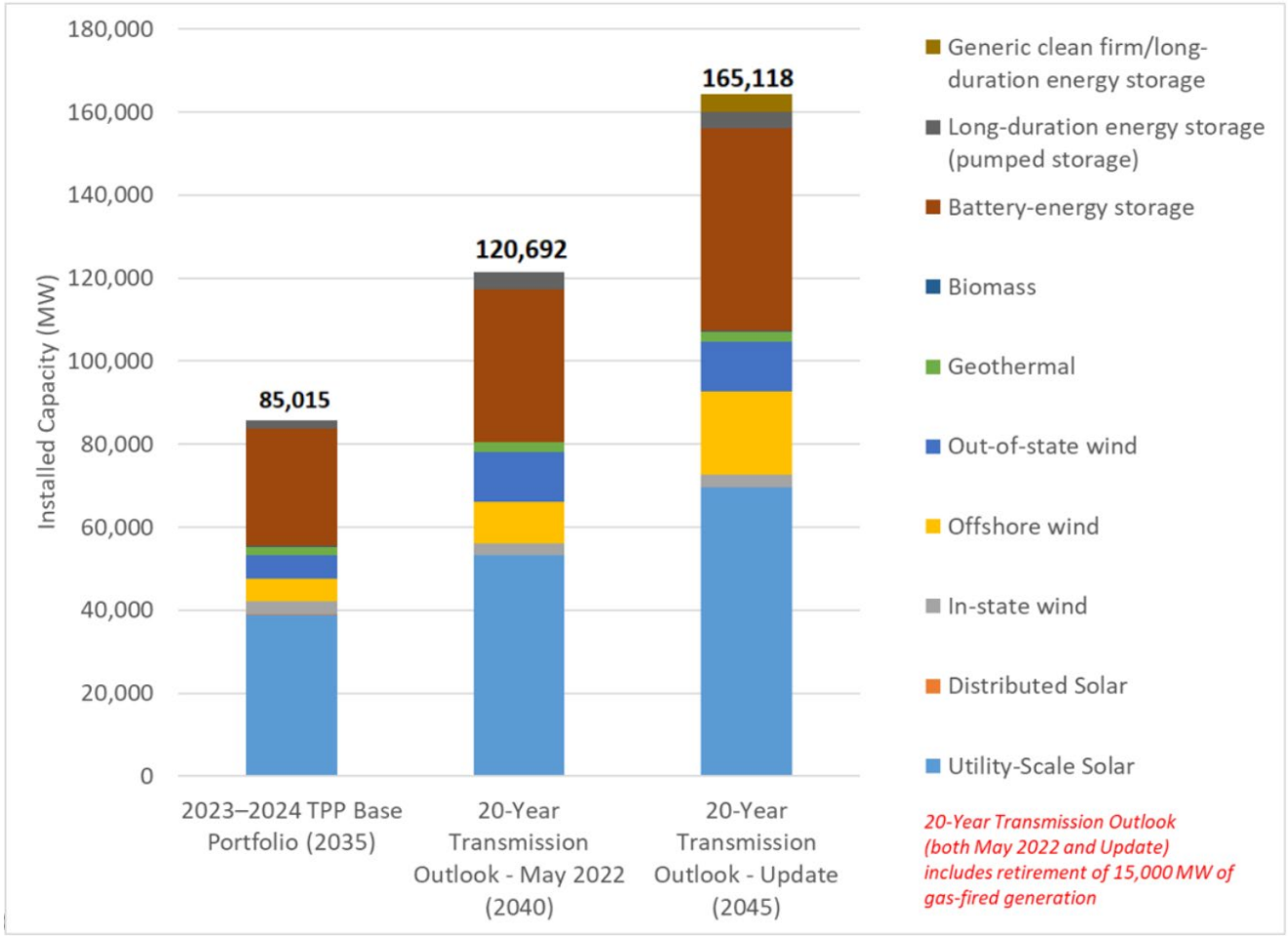
Energy Demand Forecast

- CEC provided hourly forecasts for each PTO area (PG&E, SCE & SDG&E)
- Includes approximately 42 GW of BTM PV capacity in 2045
- For the additional achievable components of the forecast CEC has provided disaggregation to 2035
  - For 2036 through 2045, the ISO will disaggregate the load from the TAC area to busbar using a weighting approach

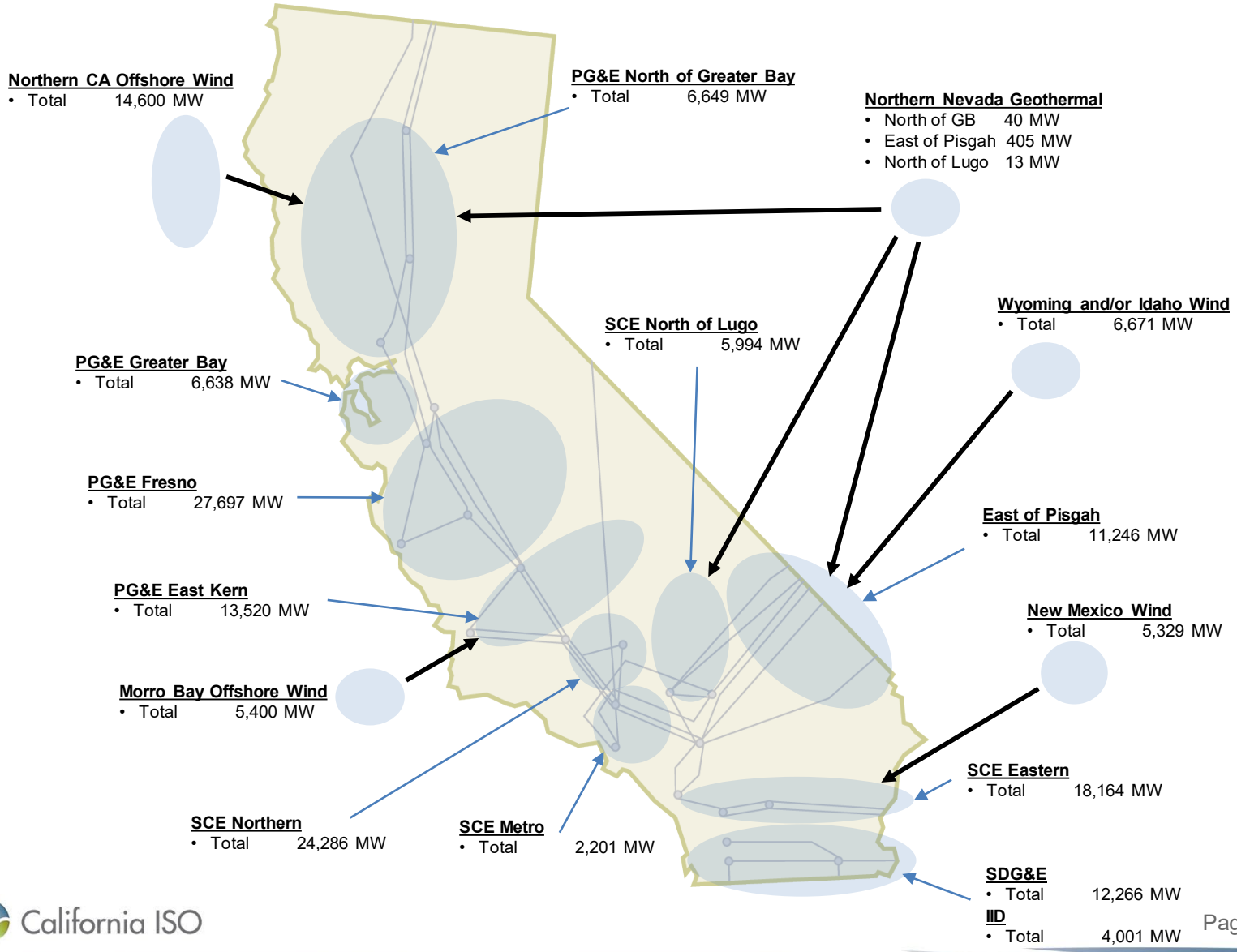
2045 CAISO Peak Day Hourly Profile



Portfolios – 2023-2024 Transmission Planning Process and 20-Year Transmission Outlook



2045 Scenario Portfolio by Interconnection Area

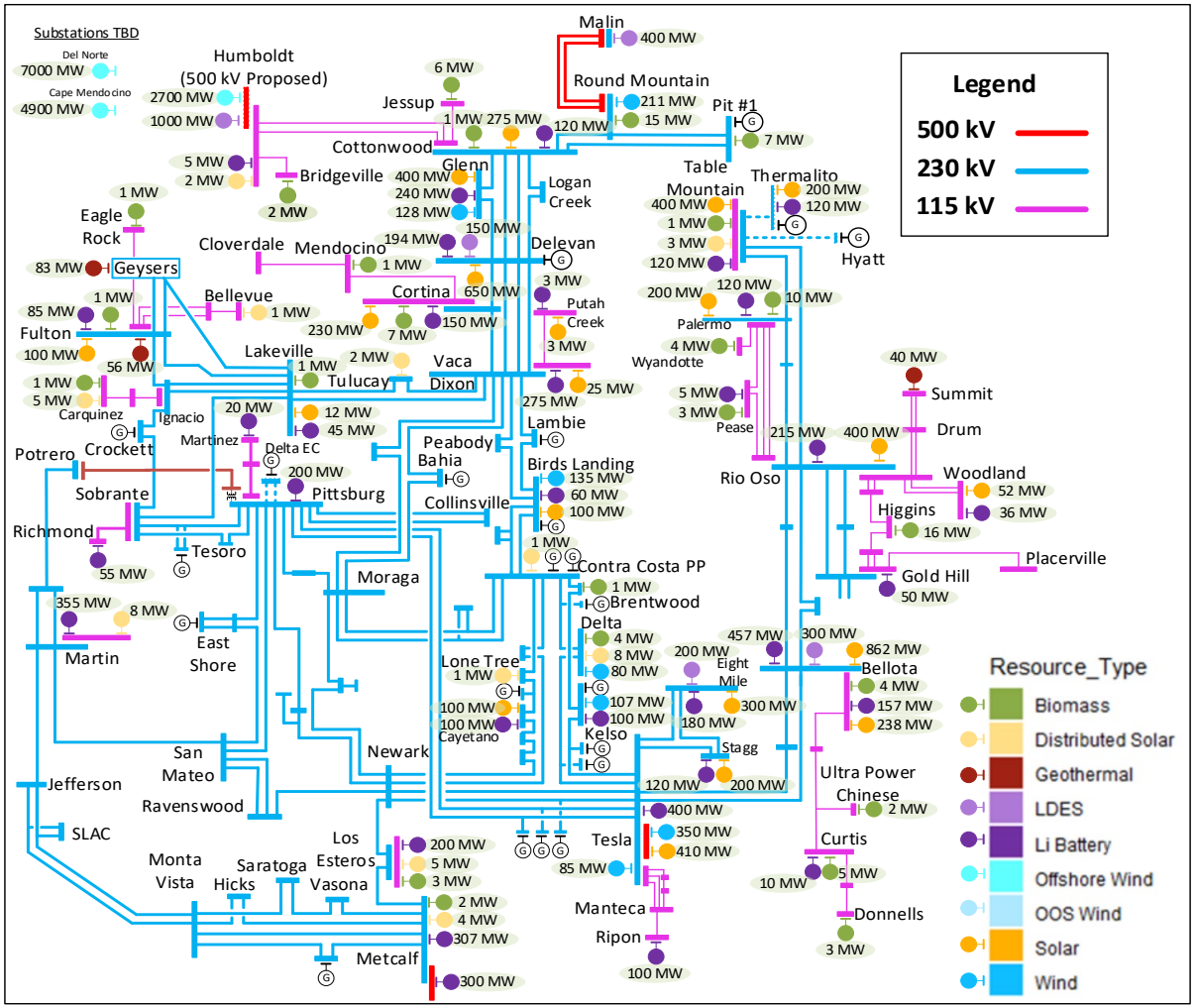


Portfolio Mapping

- Final dashboard for the mapping results of the 2045 Scenario for the update to the 20-Year Transmission Outlook
  - https://efiling.energy.ca.gov/GetDocument.aspx?tn=251044&DocumentContentId=85982

- The following diagrams include updated mapping based on CAISO defined and studied Transmission Areas

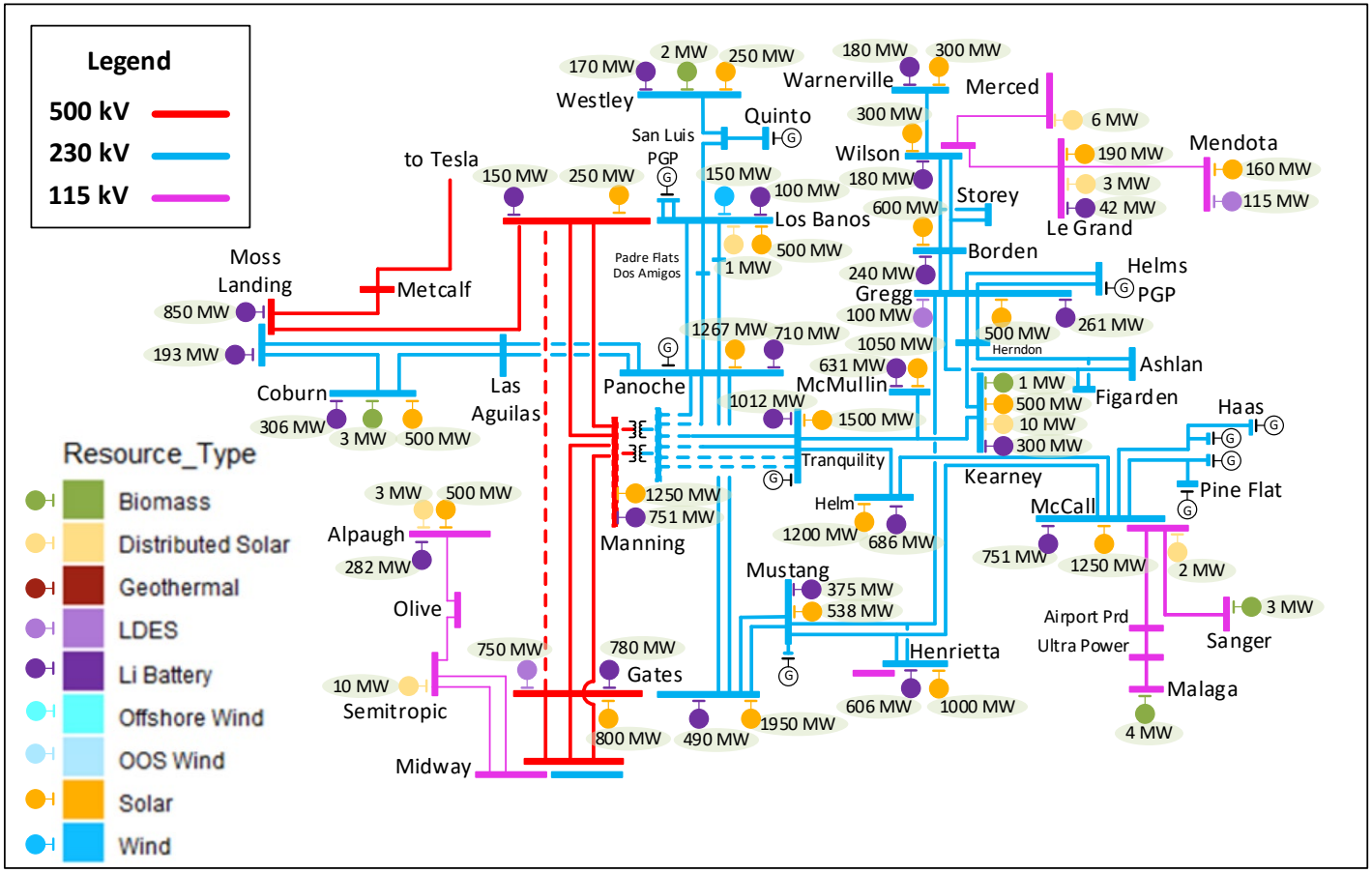
2045 Scenario: PG&E Greater Bay and North of Greater Bay



FCDS
24,274 MW

Total
27,927 MW

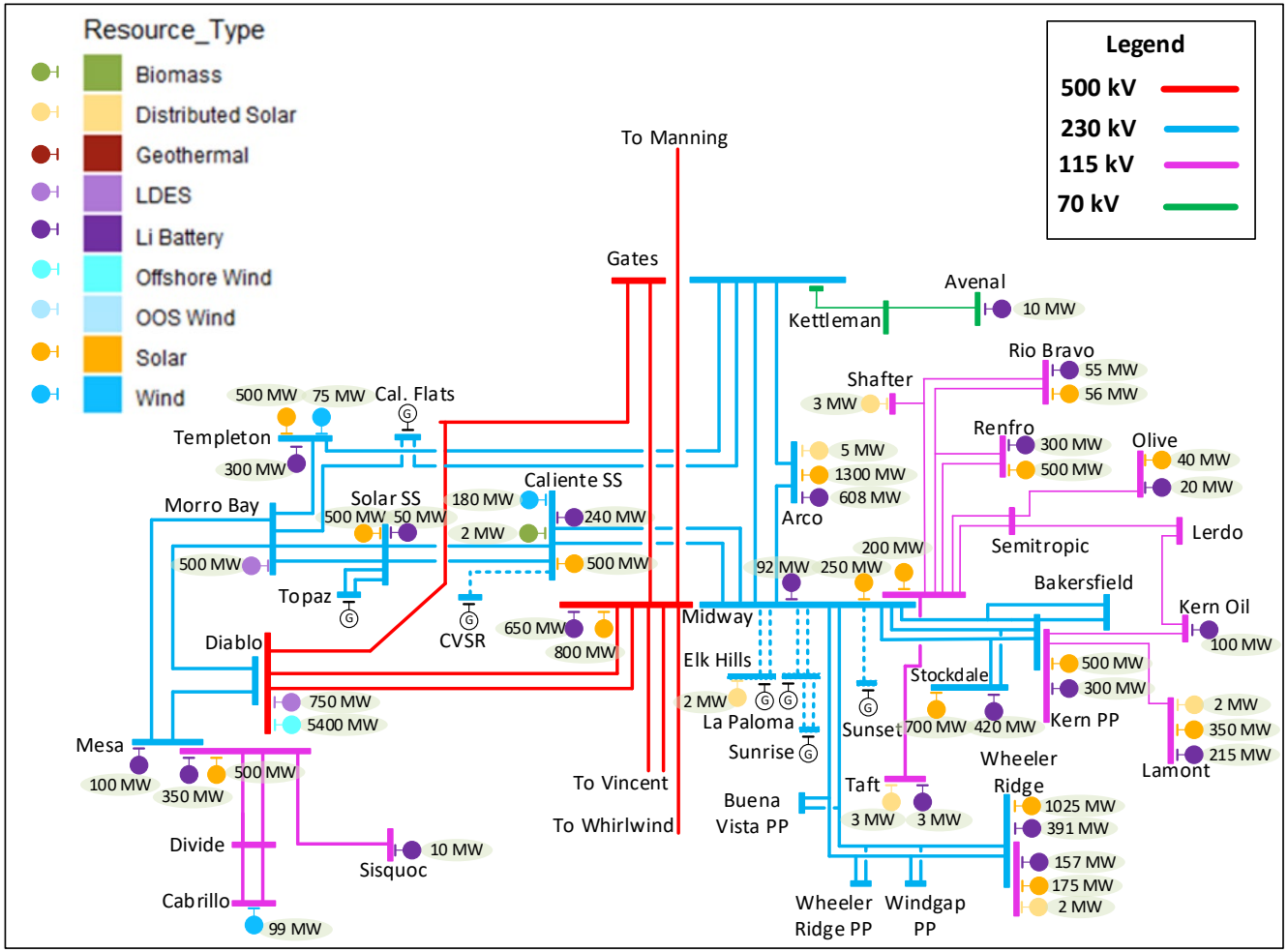
2045 Scenario: PG&E Fresno



FCDS
17,568 MW

Total
27,697 MW

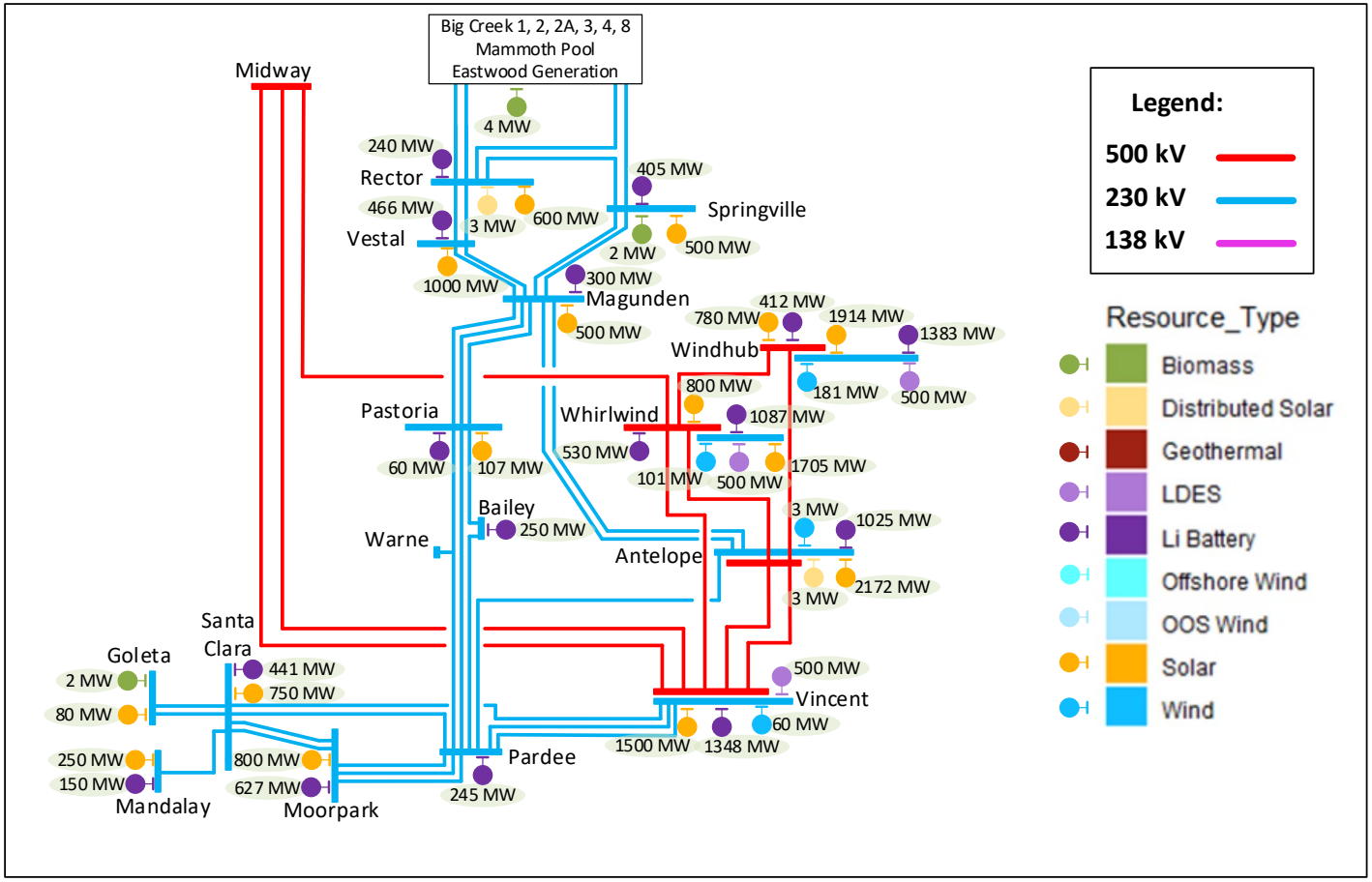
2045 Scenario: PG&E Kern



FCDS
13,800 MW

Total
18,920 MW

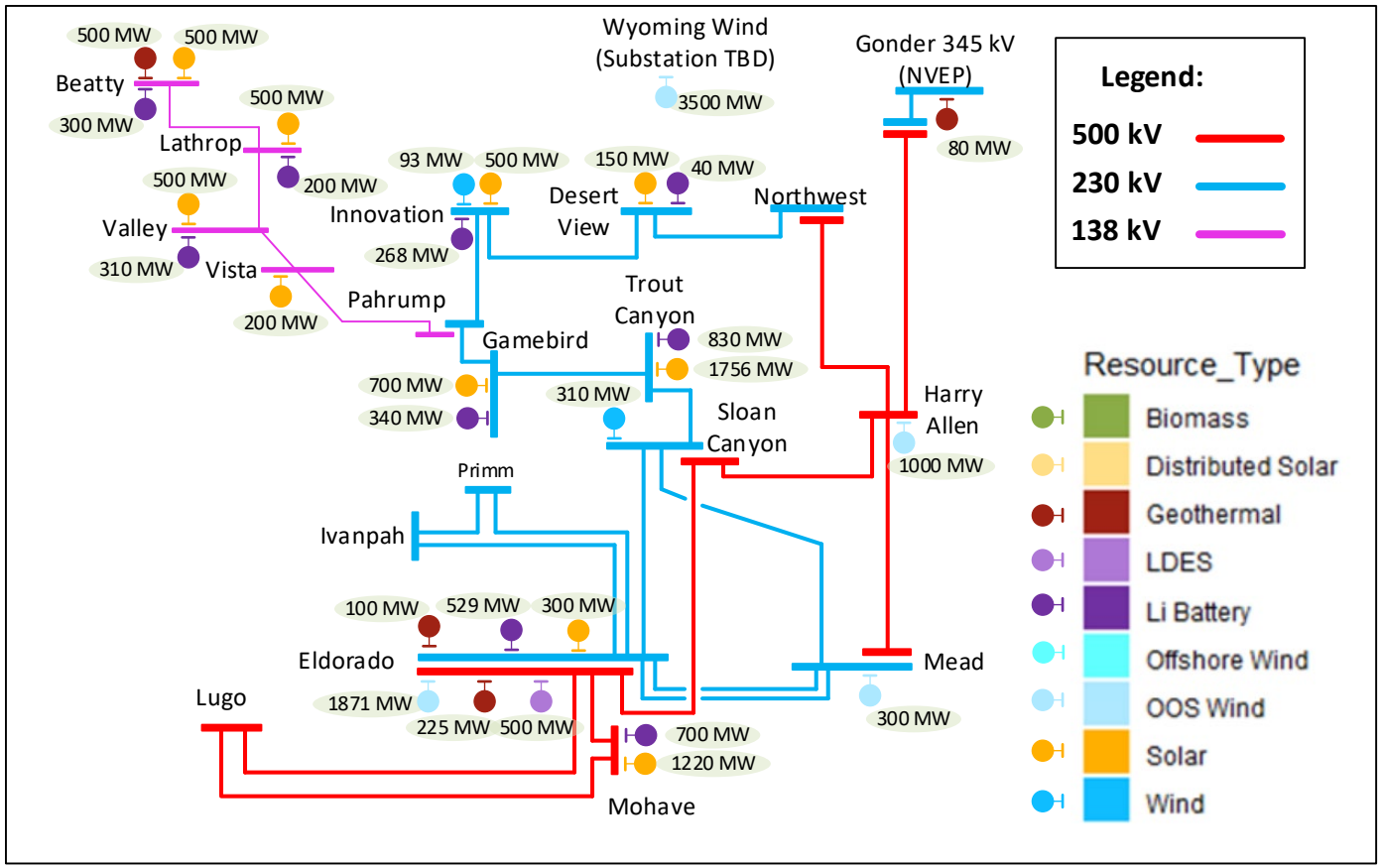
2045 Scenario: SCE Northern



FCDS
16,049 MW

Total
24,286 MW

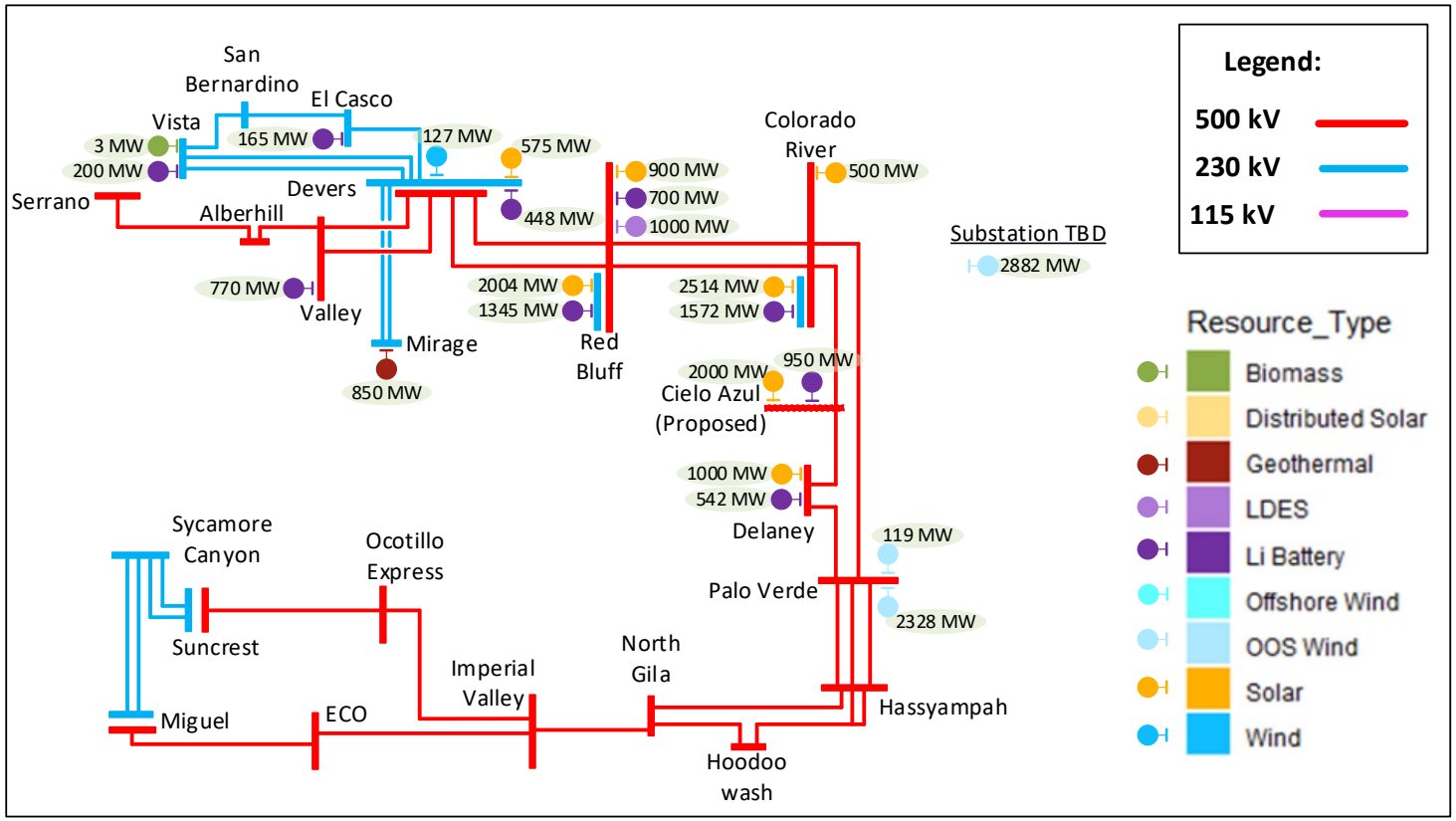
2045 Scenario: East of Pisgah



FCDS
14,469 MW

Total
18,322 MW

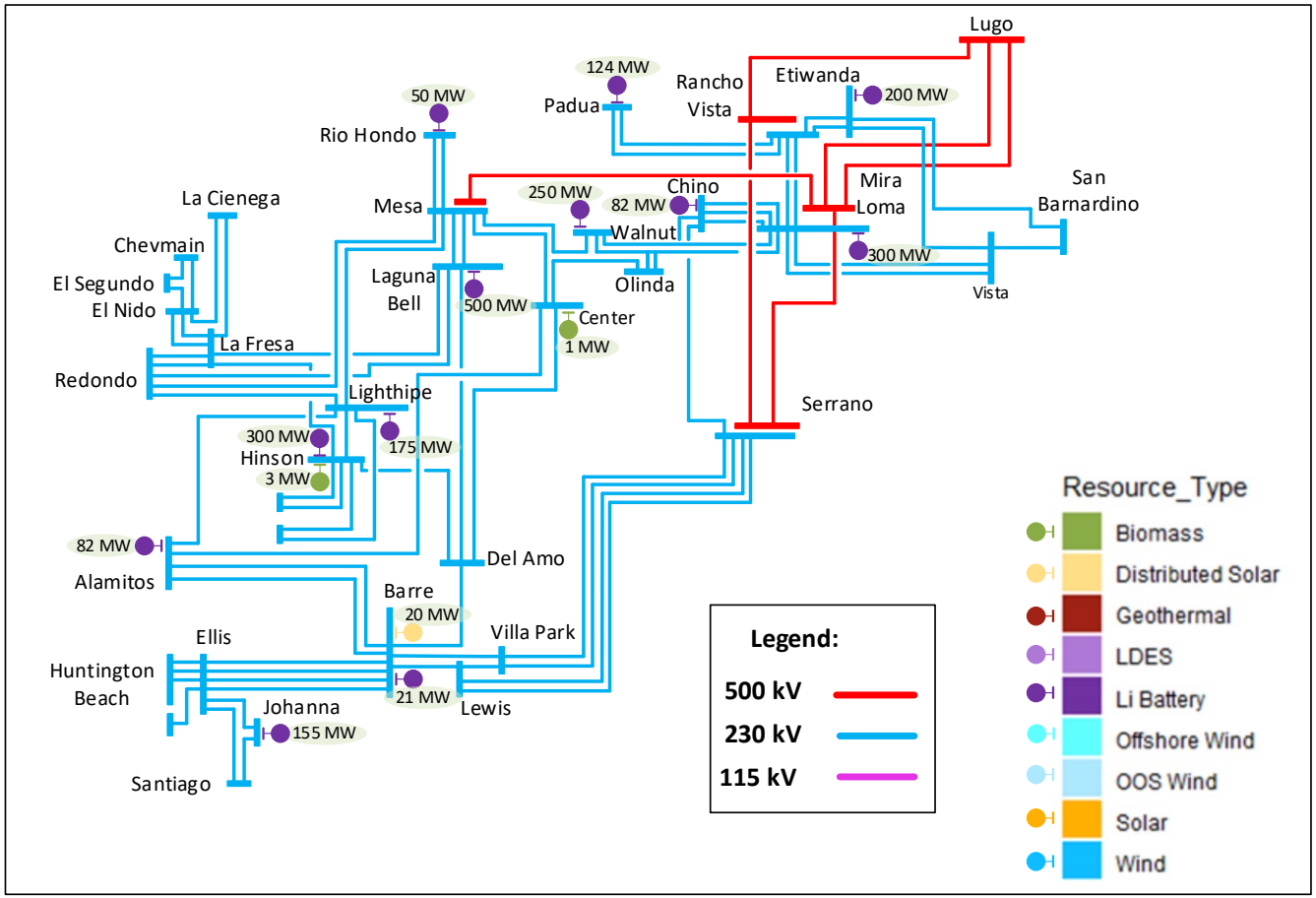
2045 Scenario: SCE Eastern



FCDS
16,910 MW

Total
23,493 MW

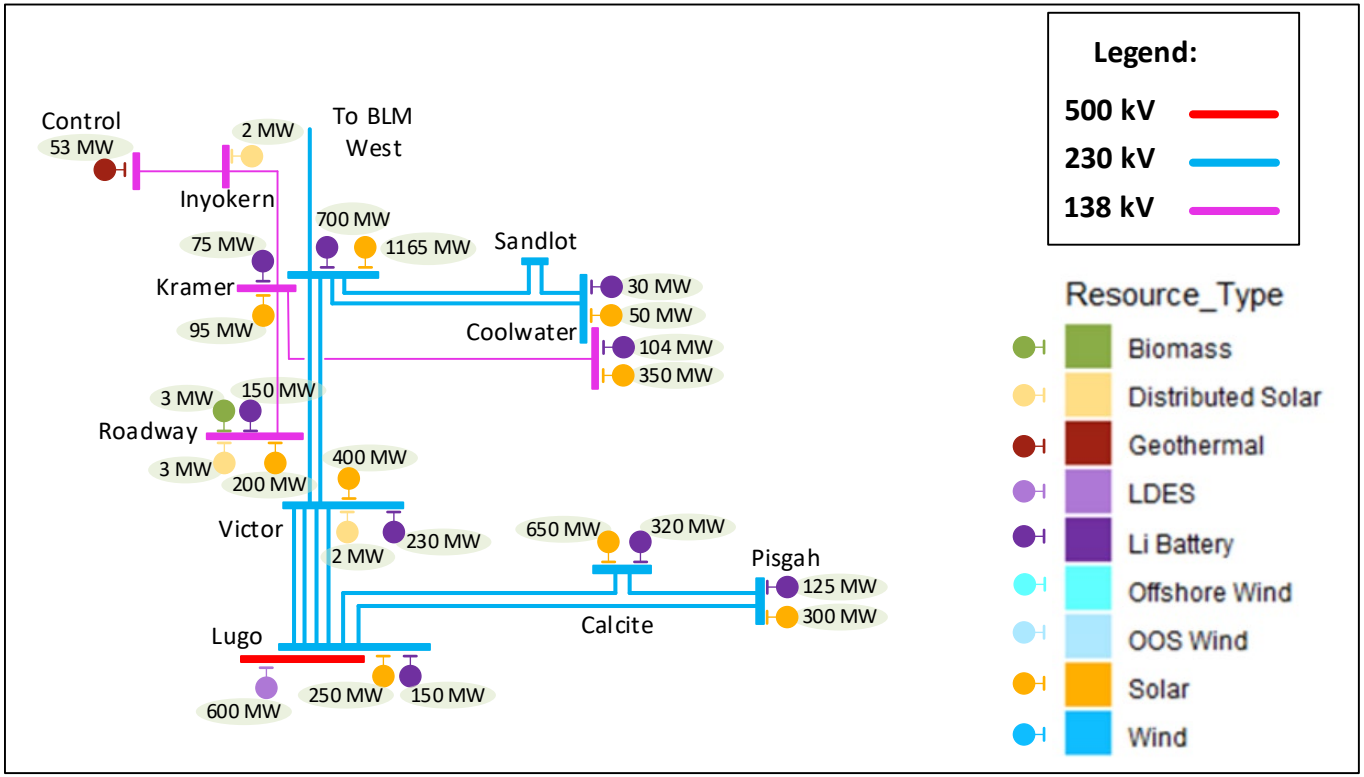
2045 Scenario: SCE Metro



FCDS
2,201 MW

Total
2,201 MW

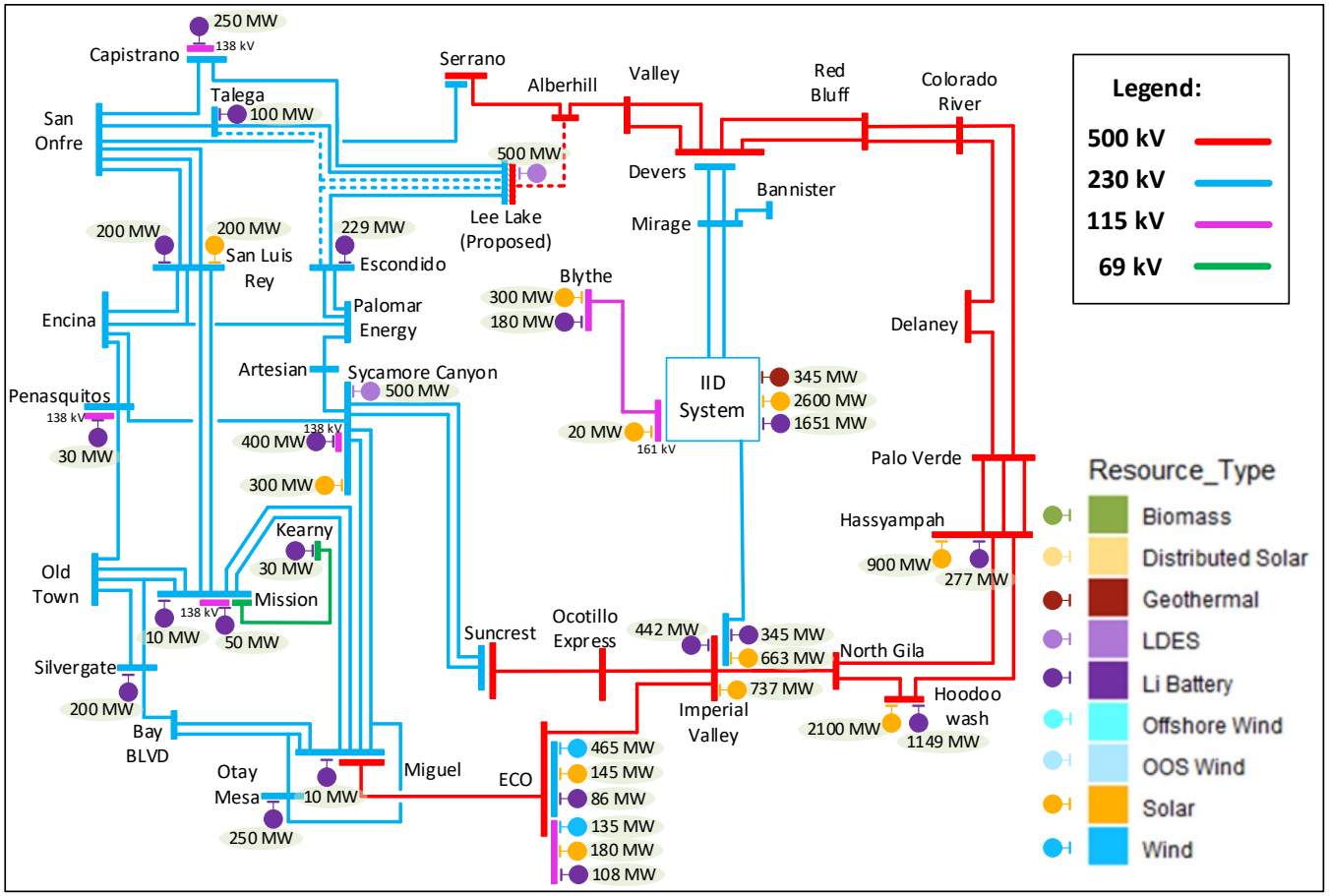
2045 Scenario: SCE North of Lugo



FCDS
4,097 MW

Total
6,007 MW

2045 Scenario: SDG&E



FCDS
10,140 MW

Total
16,267 MW

Coordination with 2023-2024 transmission planning process

- The process is expected to include higher level technical studies to test feasibility of alternatives, and not the detailed level of comprehensive analysis that underpins the 10-Year Transmission Plan
- Accordingly we will coordinate with currently scheduled 10-Year Transmission Plan stakeholder sessions to the extent possible, and hold separate stakeholder sessions as appropriate.
- The process welcomes and will incorporate stakeholder input and consultation.

20-Year Transmission Outlook - Update

- CEC Docketed “Final Staff Paper for the 2045 Scenario for the 20-Year Transmission Outlook” – July 13
- ISO stakeholder call – August 16
- The ISO will provide updates at the 2023-2024 transmission planning stakeholder meetings:
  - September 26 and 27
  - November 16
  - Additional may be added as required
- Draft 20-Year Transmission Outlook – March 31, 2024
- Finalize 20-Year Transmission Outlook – May 2024

Day 2 - Wrap-up
Reliability Assessment and Study Updates

Isabella Nicosia
Senior Stakeholder Engagement and Policy Specialist

2023-2024 Transmission Planning Process Stakeholder Meeting
September 26-27, 2023

Request Window Submissions for Reliability Assessment

- Request Window closes October 15
  - Request Window is for alternatives in the reliability assessment
  - Stakeholders requested to submit comments to: requestwindow@caiso.com
  - ISO will post Request Window submission on the market participant portal

Comments

- Comments due by end of day October 11, 2023

- Submit comments through the ISO's commenting tool, using the template provided on the process webpage:
- https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/2023-2024-Transmission-planning-process