Board of Directors Meeting
Special Board Retreat - Power Procurement

Wednesday, July 6, 2022
11:00am
https://us02web.zoom.us/j/87023071843
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Webinar ID: 870 2307 1843

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If you have anything that you wish to be distributed to the Board of Directors, please email it to the clerk by 5:00 pm the day prior to the meeting.

1. **Welcome & Roll Call**

2. **Pledge of Allegiance**

3. **Public Comment**
   This item is reserved for persons wishing to address the Board on any EBCE-related matters that are not otherwise on this meeting agenda. Public comments on matters listed on the agenda shall be heard at the time the matter is called. As with all public comment, members of the public who wish to address the Board are customarily limited to two minutes per speaker and must complete an electronic speaker slip. The Board Chair may increase or decrease the time allotted to each speaker.

4. **Power Procurement Overview (Informational Item)**
   Receive overview of Power Procurement activities.

5. **Board Member and Staff Announcements including requests to place items on future Board Agendas**

6. **Adjournment** to Wednesday, July 20, 2022 at 5:00pm

EAST BAY COMMUNITY ENERGY

Board Retreat: Power Procurement Overview

PRESENTED BY: Izzy Carson, Chris Eshleman, Ray Dai, Jim Dorrance, Marie Fontenot, Karen Lee

DATE: July 6, 2022

Agenda

- **Section 1:** Energy Markets & RPS Overview
- **Section 2:** Integrated Resource Planning: Role & Challenges
- **Section 3:** Energy Risk Management & Business Risks
- **Section 4:** Resource Adequacy

EAST BAY COMMUNITY ENERGY

SECTION 1:

Energy Markets & RPS Overview

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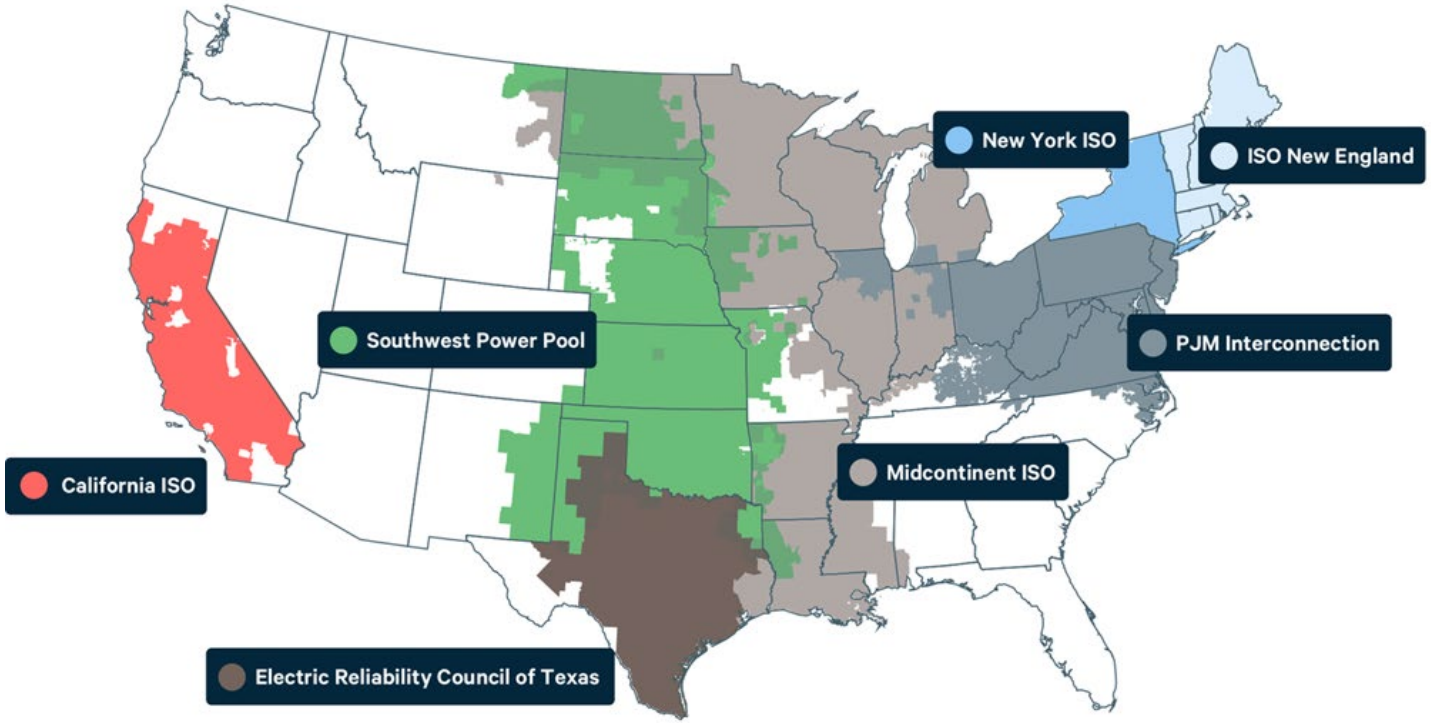
North American Balancing Authority Areas



Source: Homeland Infrastructure Foundation-Level Data (2019)

RFF

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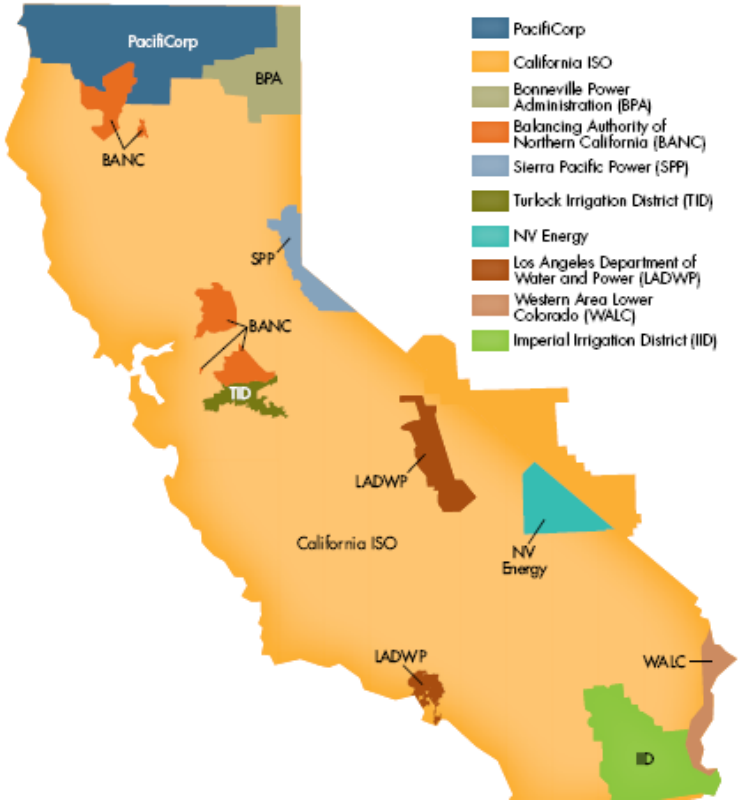
California Balancing Authority Areas

CAISO BAA

- Avg. Peak Load 45,000 MW
- 26,000 circuit miles of transmission

Role of CAISO

- Competitive Wholesale Power Market
- Reliable Operations
- Grid Planning and Development



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Wholesale Energy Market Products

- **Energy**
- **Transmission**
- **Capacity**
  - Resource Adequacy
  - Ancillary Services
    - Operating Reserves
    - Regulation Services
- **Natural Gas**
- **Congestion Revenue Rights**
- **Renewable Energy Products**

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CAISO Markets

Day-Ahead Market

- Matching Supply / Demand
- Majority of Transitions
- Market Processes

Real-Time Market

- Matching Supply / Demand
- Incremental Adjustments to DAM
- 15-Min. and 5 Min. settlements
- Market Processes

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CAISO Nodal Pricing Settlement

Load and Supply Nodal Settlement

- Load Settlement at DLAP
  - Default Load Aggregation Point
  - EBCE in PG&E DLAP
- Generation Settlement
  - Individual PNODE
    - Pricing at location of generation
- Inter-SC Trades
  - Trading Hub Settlement
  - NP15 EZ GEN HUB
    - Weighted average of generation PNODs

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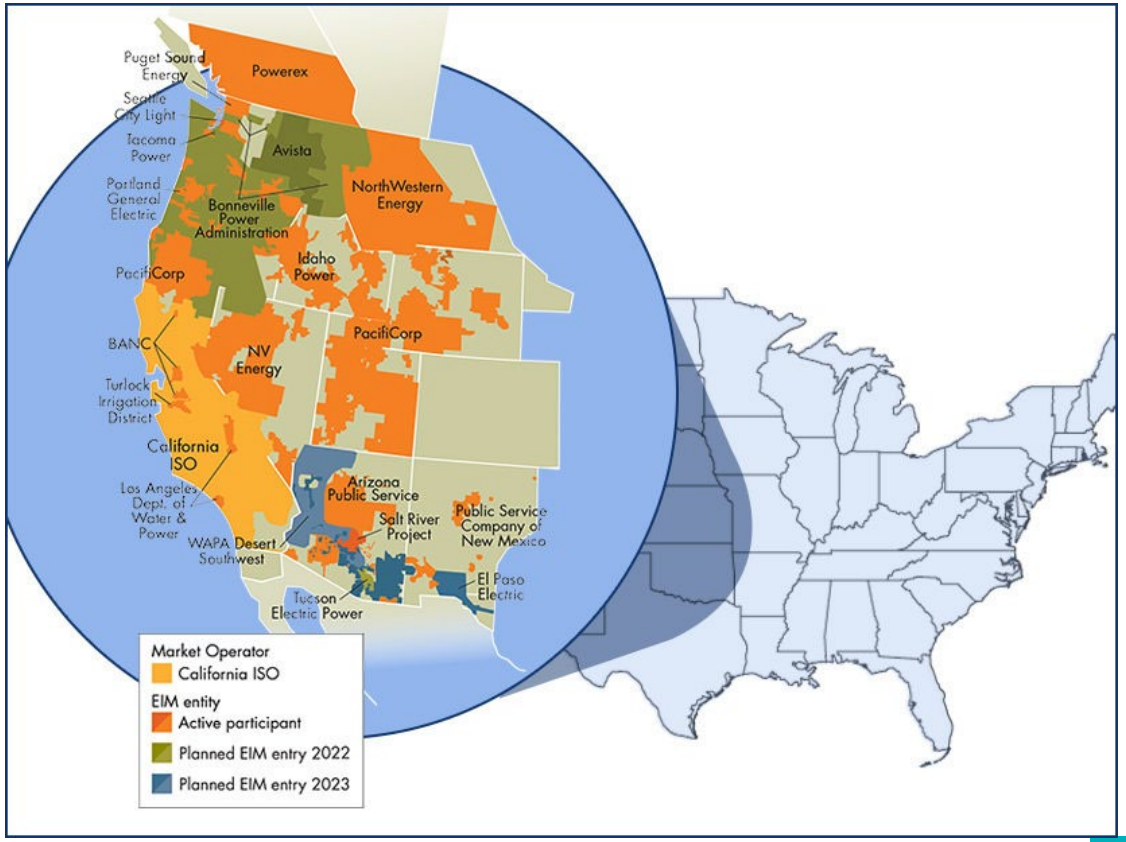
CAISO EIM – Energy Imbalance Market

Primary Goals

- Enhance reliability
- Generate cost savings
- Improve integration of renewables
- Tap into locational specific resources
- Reduce price variability



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Regulatory Bodies

CAISO

- California Independent System Operator
  - Manages the flow of electricity on high-voltage power lines, operates a wholesale energy market, and oversees infrastructure planning.

FERC

- Federal Energy Regulatory Commission
  - United States federal agency that regulates the transmission and wholesale sale of electricity and natural gas in interstate commerce.

NERC

- North American Electric Reliability Corporation
  - Nonprofit corporation created by the electric utility industry to promote the reliability and adequacy of bulk power transmission in the electric utility systems of North America.

CPUC

- California Public Utilities Commission
  - Regulatory agency that regulates privately owned public utilities in the state of California, including electric power, telecommunications, natural gas and water companies.

CEC

- California Energy Commission
  - As the state's primary policy and planning agency, the Energy Commission is committed to reducing energy costs and environmental impacts of energy use while ensuring a safe, resilient, and reliable supply of energy.

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Compliance with the Renewable Portfolio Standard (RPS)

What is RPS?

- Key program for advancing renewable energy
- Sets escalating renewable energy procurement requirements for CA Load-Serving Entities
- Must be procured from RPS eligible facilities
- Targets verified on multi-year period rather than annually

CP#	CP3		CP4				CP5			CP6		
Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
RPS %	31%	33%	36%	39%	41%	44%	47%	49%	52%	55%	57%	60%

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Portfolio Content Category (PCC) Classifications and Renewable Energy Credits (RECs)

RECs:

- Represent clean energy attributes of renewable electricity
- Each REC is equivalent one MWh of renewable electricity generated
- Limitations to the amount that each group can count towards RPS requirements

Classified into three distinct categories

PCC 1	Energy and REC are from same source and delivered into a California Balancing Authority (CBA) without any substitution
PCC 2	Substitute Energy not from the same source as REC
PCC 3	Electricity Products Not Qualified as PCC 1 or PCC 2, Including Unbundled RECs

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Compliance with the Renewable Portfolio Standard (RPS)

RPS Compliance

- Multi-year compliance periods with annual reporting requirements
- Minimum required percent of electricity from designated renewable energy resources

vs.

Power Content

- Annual requirement, for 1 calendar year of purchases
- Detailed breakdown on sources of energy used to provide electricity
- Resembles a nutrition label

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SECTION 2:

Integrated Resource Planning & its Impact

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What is the Integrated Resource Plan (IRP)?

California statute requires all load-serving entities to prepare IRPs

- Each CCA, as well as each IOU and ESP, is required to file its IRP with the CPUC on a biennial basis (2-year cycle)
- First year of cycle: CPUC develops a Reference System Portfolio (RSP) – used in the CAISO Transmission Planning Process and in load serving entity IRPs
- Second year of cycle: LSEs file IRPs at the CPUC; CPUC aggregates, evaluates, and uses IRPs to form a recommended Preferred System Portfolio (PSP). Can also result in procurement mandates

First IRPs were due in 2018; second were 2020, next: ~November, 2022. Takeaways from previous studies:

- Initial IRPs were developed as individual plans but with no understanding of the collective impact of plans
- By planning jointly, CCAs can understand where their reliance on resources in their plan is duplicative ***or*** if their plans fail to adequately support grid reliability
- Additional detailed modeling may supplement the information developed by the CPUC

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IRP – Project Objectives

Questions we seek to answer:

- What is the ideal mix of resources to achieve both the state's and EBCE's own goals?
- What resources will most cost effectively contribute to grid reliability?
- Recognizing EBCE's plan to achieve an emission-free portfolio by 2030,what would the impact be of attempting to achieve the portfolio on a time-coincident basis

Create an Integrated Resource Plan (IRP) reference portfolio that will:

- Conform with the CPUC reference case
- Meet CPUC required inputs and regulations
- Achieve additional EBCE priorities and goals

Potentially develop a second preferred portfolio to achieve EBCE's objectives while managing risk and cost

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IRP – Goals for 2022 IRP

1) Identify cost-effective, feasible, reliable, equitable and robust options to achieve our communities' goals and objectives, and to reduce carbon emissions
2) Inform and engage stakeholders in the IRP process
3) Allow the IRP process to inform the selection of a preferred portfolio
4) Use one model for consistency in optimization, simulated dispatch, and probabilistic functions
5) Test a range of portfolios in scenario modeling and ultimately in risk analysis
6) Meet CPUC requirements
7) Timely obtain necessary Board approvals

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IRP – Objectives & Measures

- Purpose of the IRP is to evaluate CCAs' current energy resource portfolio & a range of alternative future portfolios to meet customers' electrical energy needs in an affordable, system-wide manner that also takes into account
- Each objective is important & worthy of balanced consideration in the IRP process; taking into account uncertainty, some objectives are better captured in portfolio construction than as a portfolio measure
- The measures allow the analysis to compare portfolio performance and potential risk on an equal basis

	IRP Objectives
	Affordability
	Meeting GHG Emissions Reduction Targets
	System Reliability
	Resource Diversity

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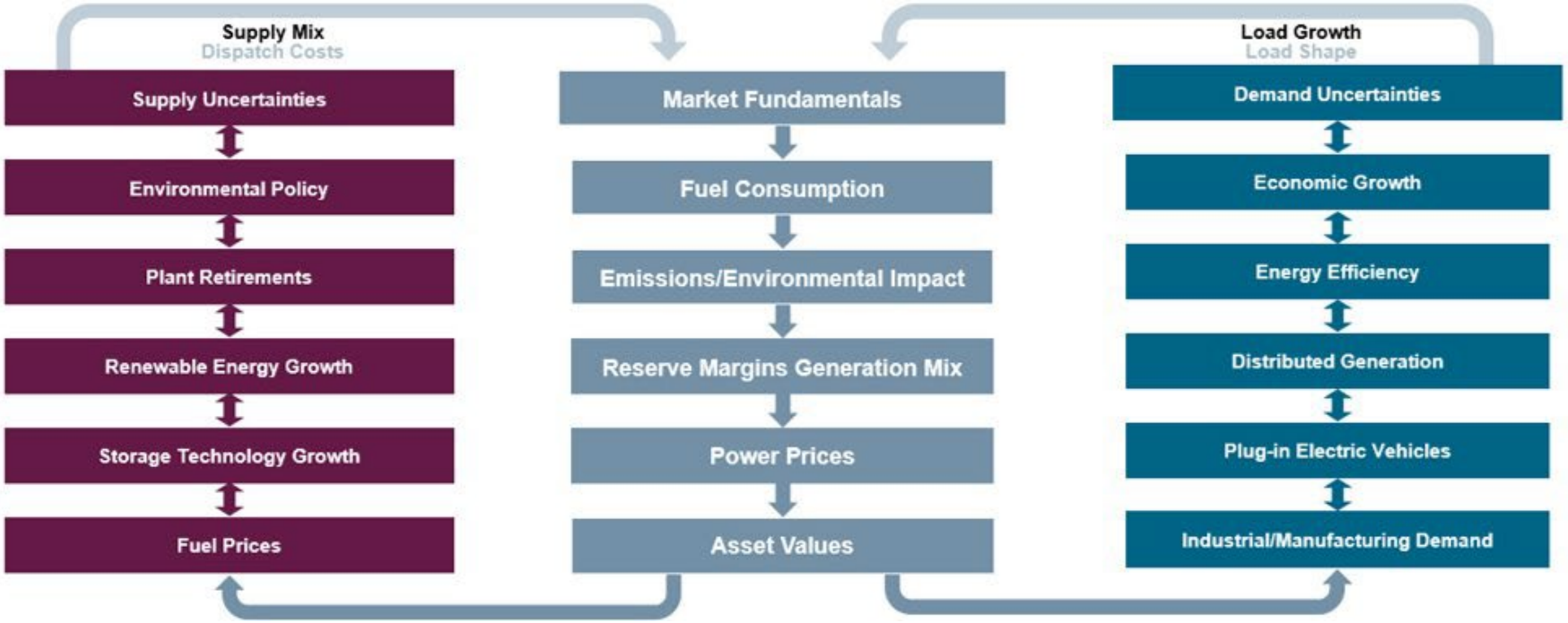
IRP – Key Market Drivers



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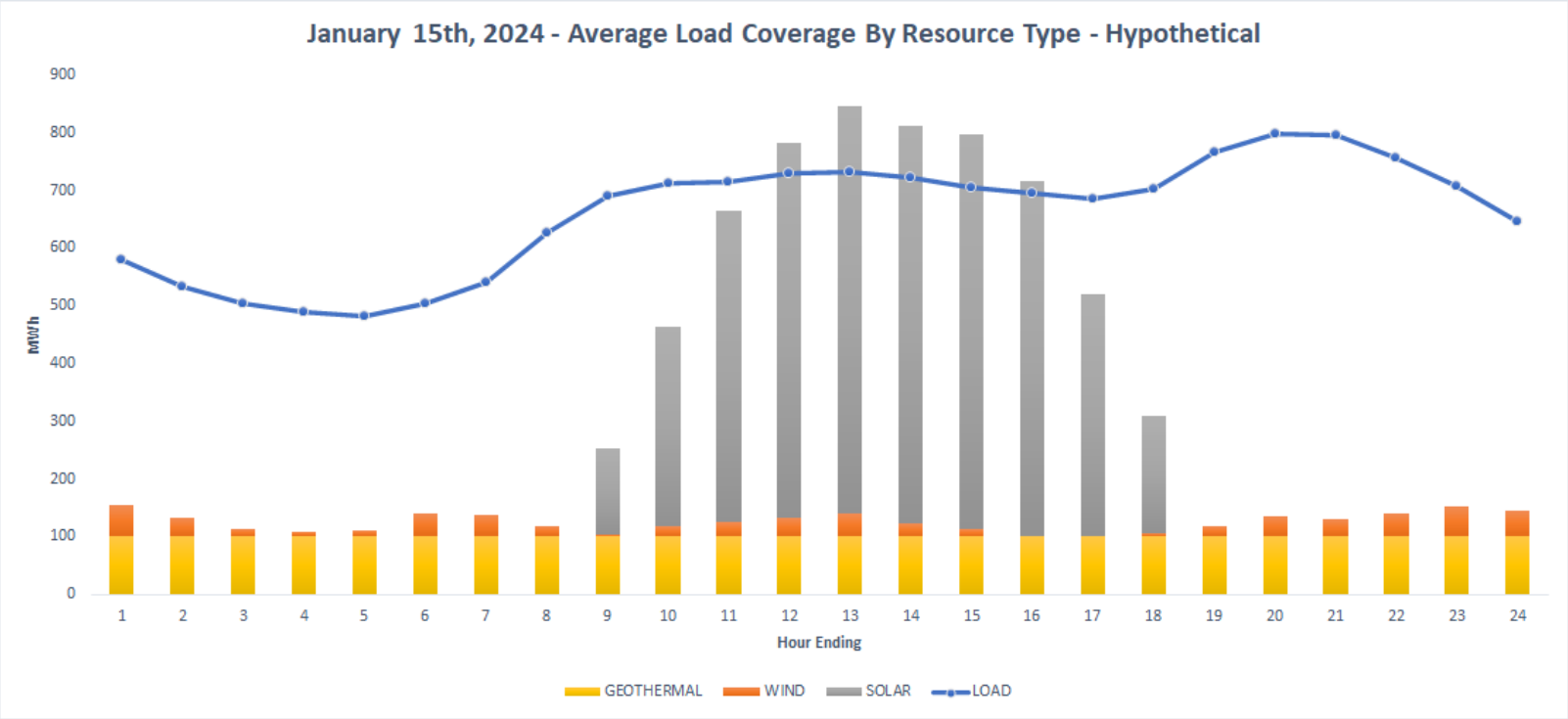
Hypothetical Future January



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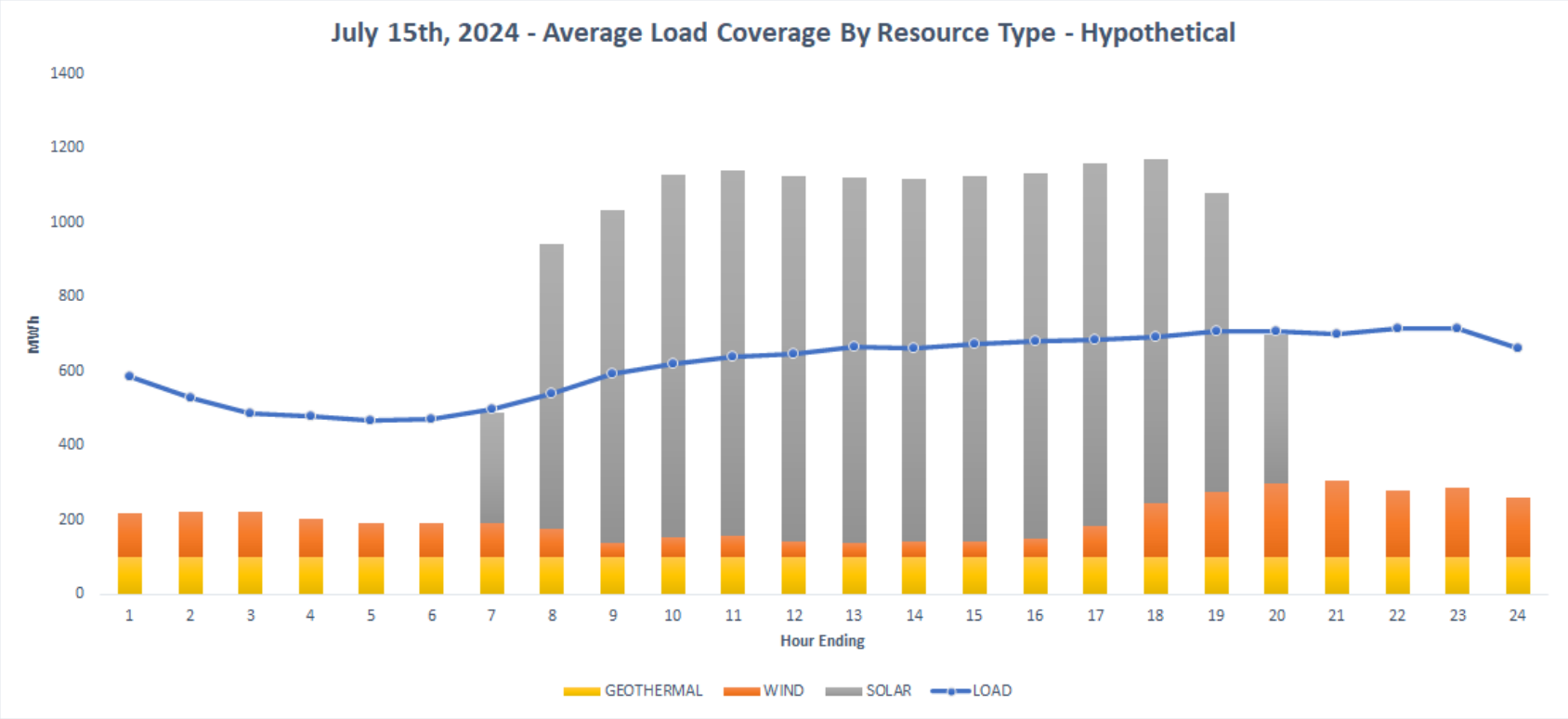
Hypothetical Future July



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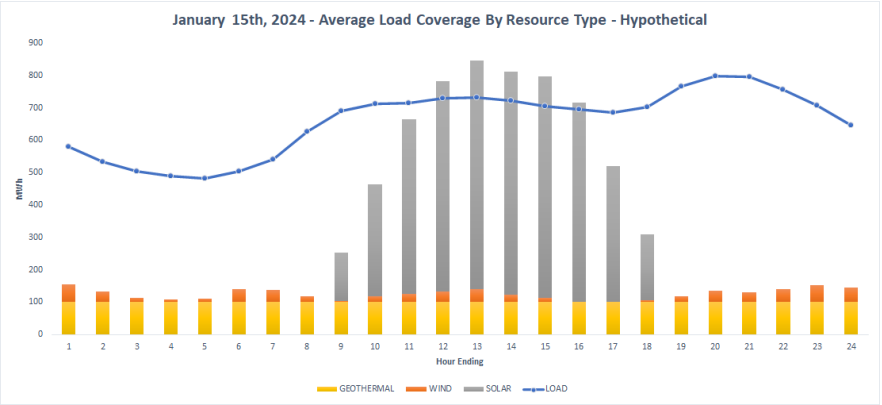
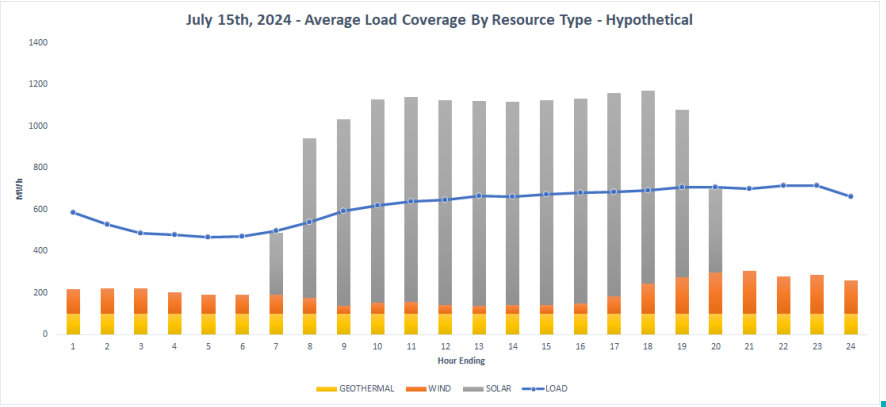
Step 1: Needs Assessment

- Demand forecast
  - Peak vs average monthly loads
- Quantity Compliance Requirements
  - RPS
  - RA
- Other EBCE-goals
- Market Dynamics
  - Open position
  - Market price exposure
- Risk Management
  - Hedge strategies
  - Financeability of transactions





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Step 2: Prioritization & Valuation

Prioritization

- Compliance Requirements
  - RPS
  - RA
- Market Dynamics
  - Open position
  - Market price exposure
- Risk Management
  - Hedge strategies
  - Finance-ability of transactions
- Other EBCE goals

Valuation

- Quantitative Inputs
  - Forward Curve Development (Energy, RA, RPS)
  - Estimated Value of Location
  - Others
- Qualitative Inputs
  - Open position risk (+ or -)
  - Credit terms & seller creditworthiness
  - Counterparty concentration
  - Project risk/ability to construct in a timely manner
  - Environmental considerations

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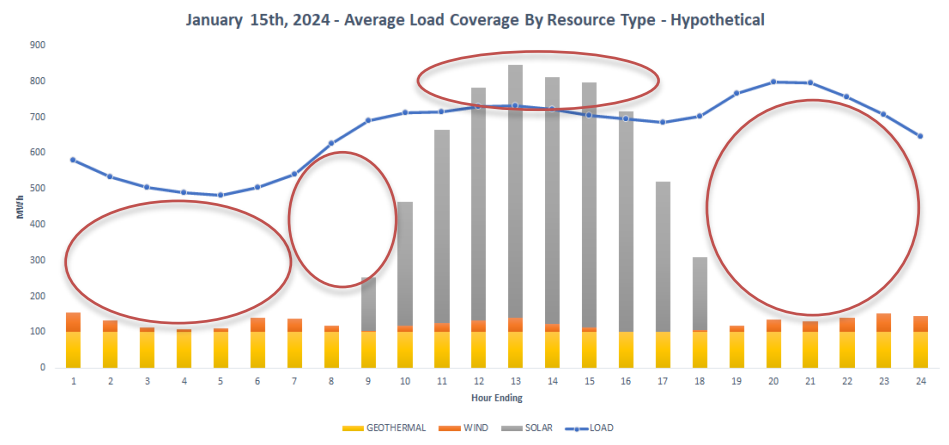
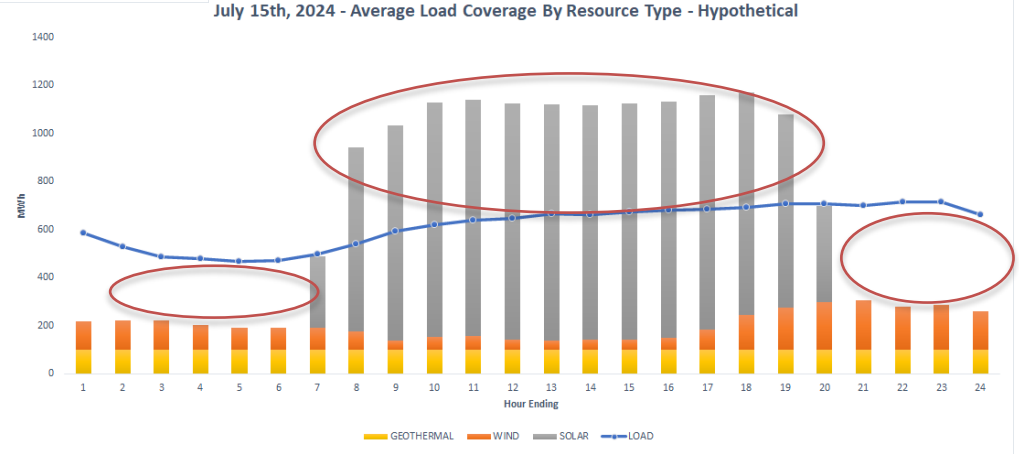
Step 3: Define Eligible Products





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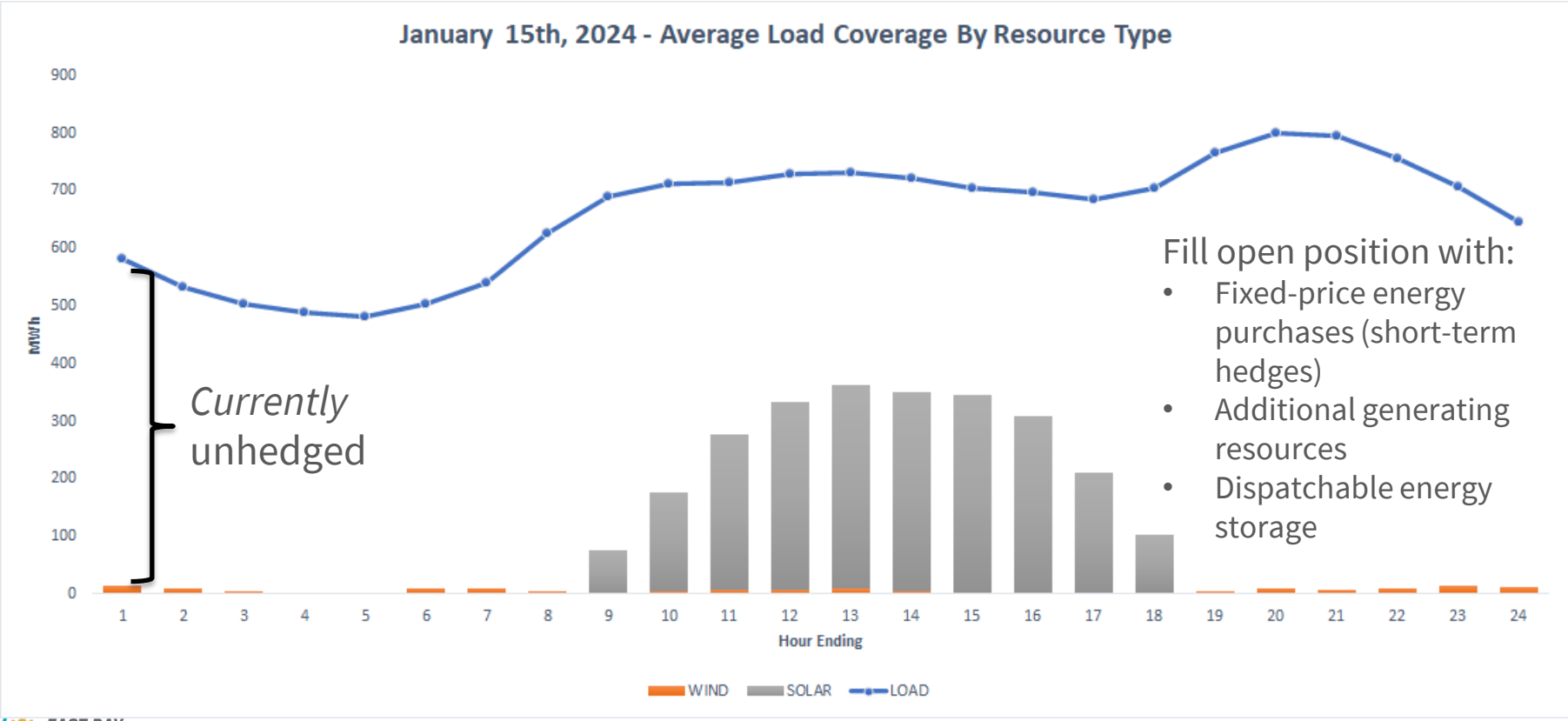
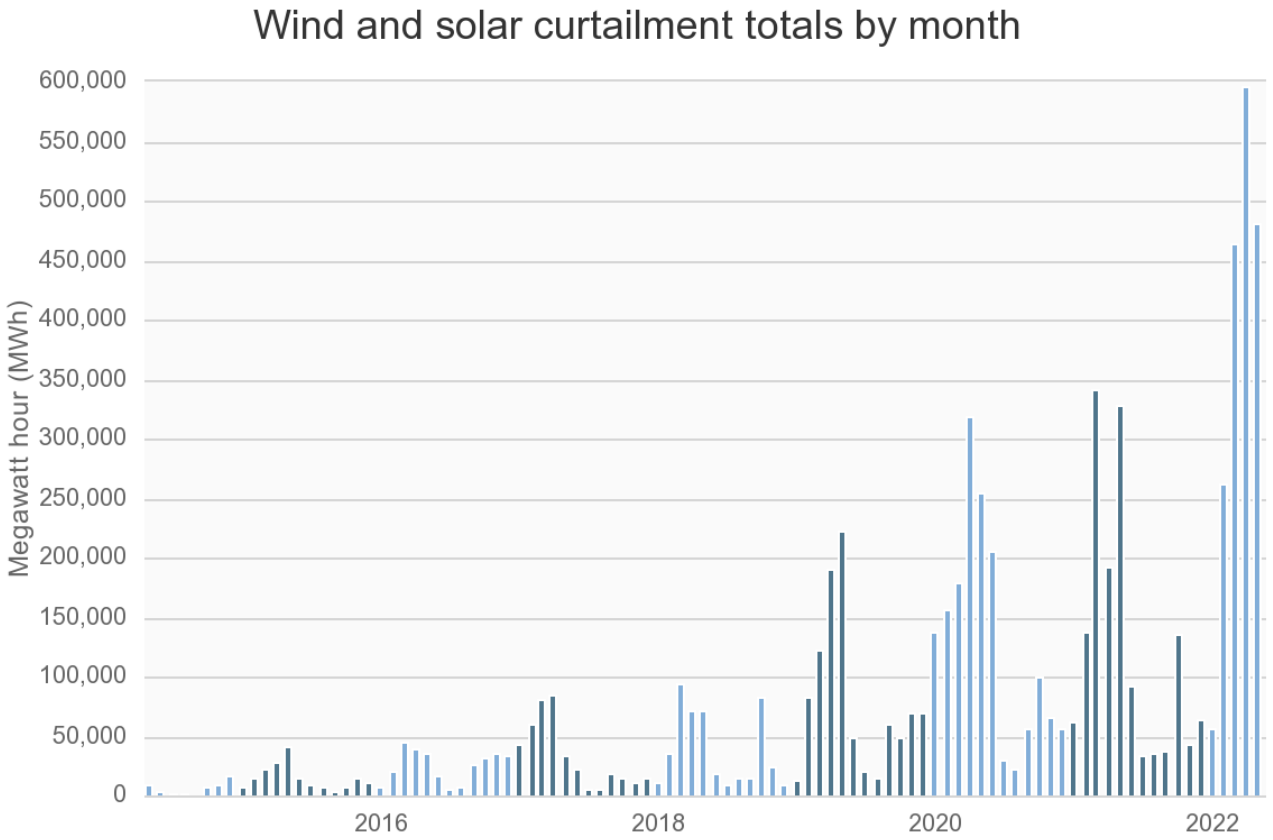
Example: “un-hedged” January, 2024



Our current portfolio of resources fills January demand…

CAISO Wide Curtailment



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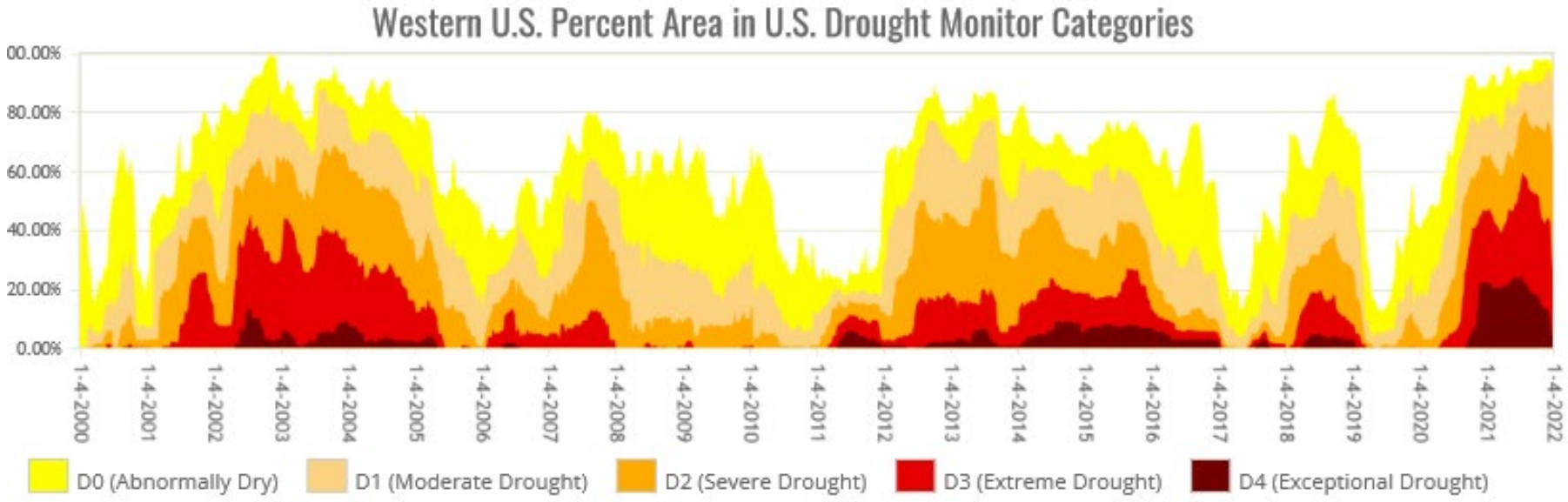
Climate Driven Drought



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Step 4: Go-to-Market

- Identify Product
- Develop Timeline
- Market/Seller Outreach
- Evaluate Offers
- Negotiate
- Calculate final, proposed notional values
- Execute Agreements

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SECTION 3:

Energy Risk Management

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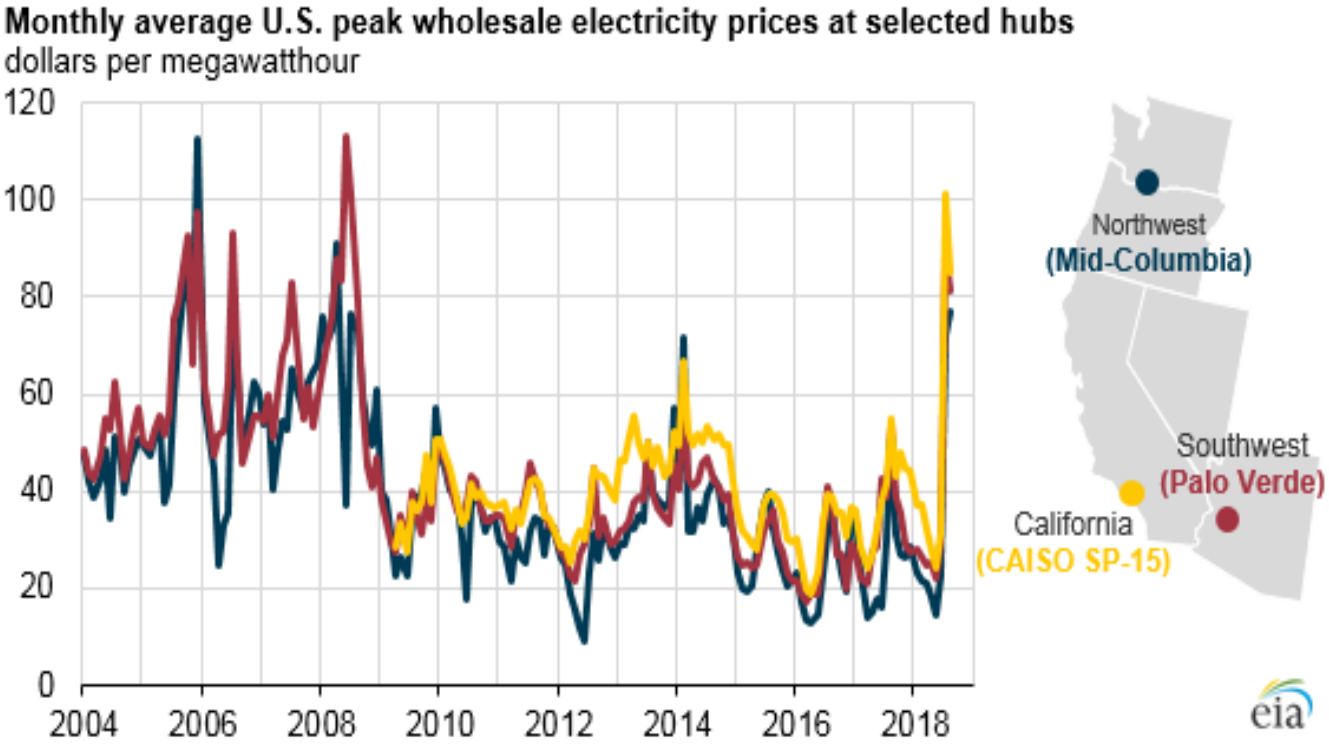
Energy Price Volatility



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Energy Risk Management

Key Energy Market Risks

- Volumetric Risk
  - Fluctuations in the volume of supply and demand
- Price Risk
  - Price volatility

Risk Management Objectives

- Mitigate Exposure to Volatility
- Durable Rates
- Financial Stability
- Regulatory Compliance (FERC & CFTC)

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Risk Oversight Committee

- Energy Risk Management Policy approved by the Board
- Energy Risk Management Procedures approved by the Risk Oversight Committee
  - Approved trading counterparties
  - Approved trading products/instruments
  - Approved personnel
  - Approved authorities
  - Compliance training
  - Exception reporting

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Hedge Strategy guided by price distribution

Long-Term Hedging

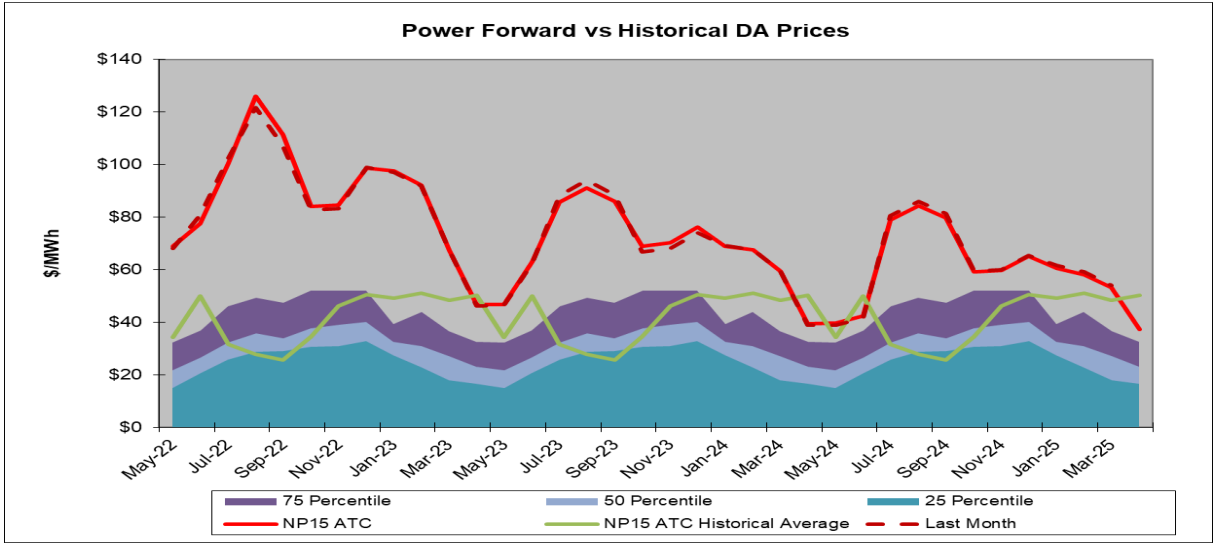
- Load Forecasting
- Coverage Objectives
- Market Conditions
- Resource Composition

Short-Term Hedging

- Refined Load Forecast
- Intra-Month / Intra-Day Shaping
- Market Conditions

Fixed-Price Energy Hedging

- Inter-SC Trades



Example:

Months to Delivery		Price Matrix Percentile						
		>60%	60%	50%	40%	25%	10%	<10%
		Covered Position as a % of Forecasted Load						
0+	3	80%	80%	85%	85%	90%	90%	100%
3+	6	70%	70%	75%	80%	80%	90%	100%
6+	9	70%	70%	75%	80%	80%	80%	90%
9+	12	60%	60%	70%	80%	80%	80%	90%
12+		60%	60%	70%	80%	80%	80%	90%

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Counterparty Credit Risk Management

- Evaluate and monitor CP credit worthiness
- Assess CP Mark to Market exposure
- Mitigate CP credit risk through collateral

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SECTION 4:

Resource Adequacy

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Resource Adequacy

Resource Adequacy (RA):

- A compliance product to ensure there is adequate capacity to match customer demand with available generation at any hour of the day in the CAISO
- Resource Adequacy is purchased as available capacity,

Requirements:

- EBCE is required to procure an amount of capacity that is determined from the peak customer demand by month + 15%
- The RA requirement is defined annually, and is impacted by customer load growth and retiring resources
- LSEs must demonstrate compliance to both the CPUC and CAISO, annually and monthly

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Resource Adequacy - Types

- CPUC Jurisdictional LSEs (EBCE) have 3 types of RA requirements: System, Local and Flexible

System	Local*	Flexible
• Interconnected to CAISO • Imports ○ Energy imported from outside the CAISO	• EBCE has a Local capacity requirement • Local areas have limited import capability (transmission constraints) with local reliability problems	• Determined by resource ability to dispatch energy during hours of "flexible need" • Both System and Local can be flexible

***Central Procurement Entity (CPE):** EBCE is responsible for Local RA in 2022 and years prior. Starting in 2023 Local RA will be purchased by the CPE.

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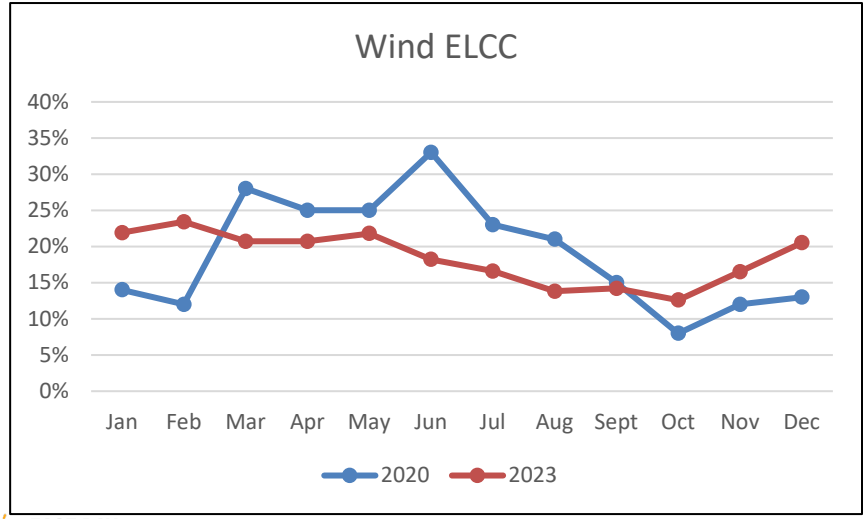
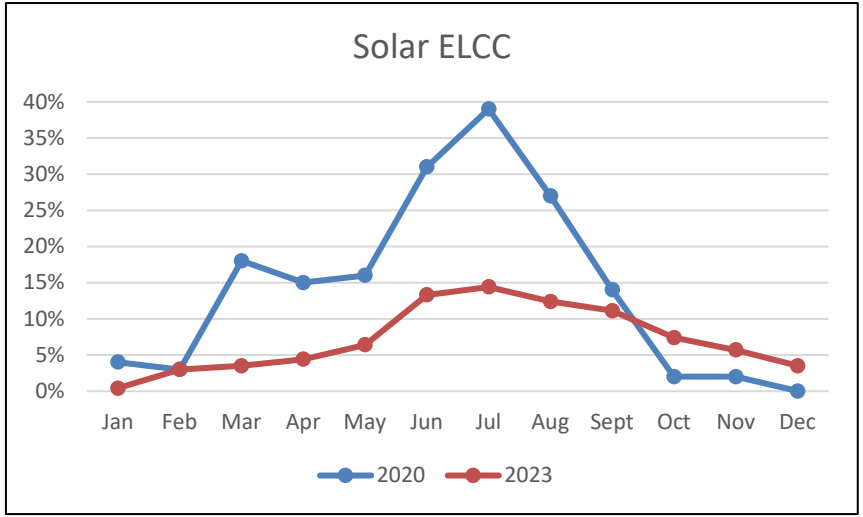
Resource Adequacy - Renewables

- ELCC (Effective Load Carrying Capability) is used to determine the contribution of intermittent resources to system reliability.
- Solar and wind offer diminishing contributions to RA as penetration grows, particularly for solar, which was already facing low ELCC.
- Dramatic decrease in Solar ELCC in summer months will contribute to a more constrained RA market in summer.





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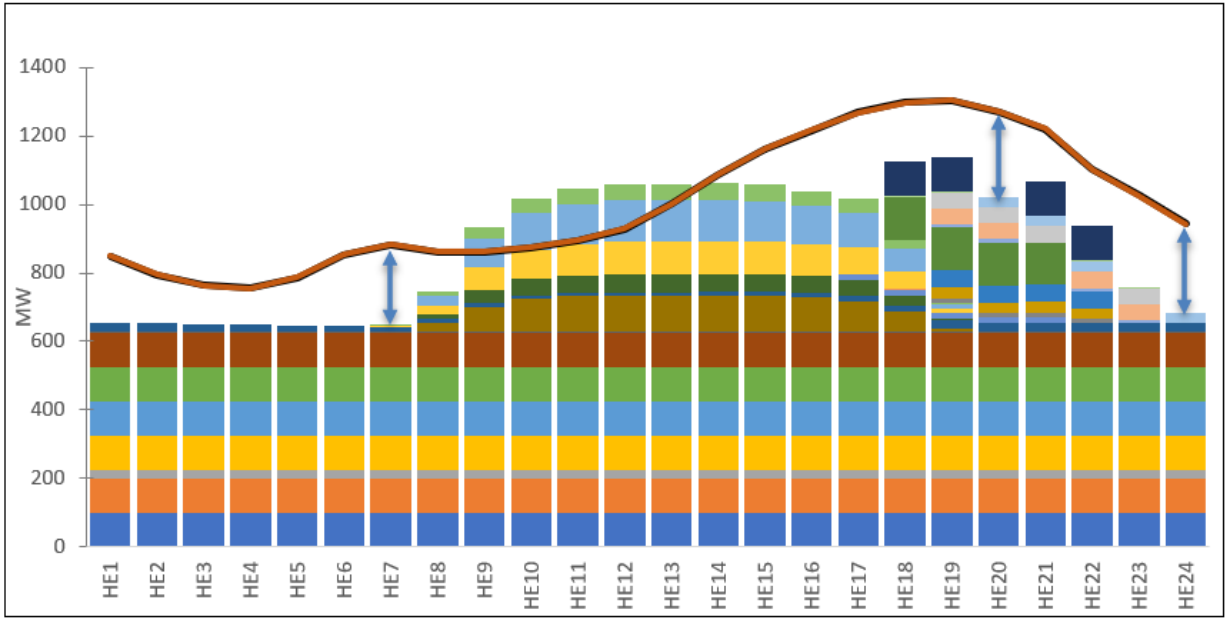
RA Reform & Slice of Day

- Intent of RA Reform: Minimize customer cost, meet hourly reliability needs, be adaptable to a changing grid.
- Full implementation starts with compliance year 2025.
- Under SOD, RA obligations based on EBCE's hourly share of CAISO load for the "worst day" of each month.
- Chart below is an example showing.



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RA – Reliability Procurement Mandates

- Two procurement orders: Near-Term Reliability (2021-23) and Mid-Term Reliability (2023-26)
- Incremental capacity to be procured from resources such as solar, wind, storage, hybrid, geothermal, demand response.

	Near-Term Reliability	Mid-Term Reliability
Compliance Term	2021-2023	2023-26
EBCE Requirement (across Compliance Term)	99.6 MW	418 MW
Resource Counting	RA framework	Incremental ELCC's (e.g. solar counts for 6.6% for 2024, and 4-hr Batteries count for 90.7% for 2024)
Penalty	none	Cost of New Entry

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QUESTIONS & DISCUSSION

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