

Exhibit to Agenda Item #1

Provide the Board presentations by external and internal experts regarding Resource Adequacy and Summer 2023 Readiness followed by a discussion on the topic.

Board Strategic Development Committee and Special SMUD Board of Directors Meeting

Tuesday, May 9, 2023, scheduled to begin at 6:00 p.m.

SMUD Headquarters Building, Auditorium

Agenda

- Summer 2022 Recap
- SMUD Summer 2023 Setup
- Market Outlook for Remainder of Year
- Questions

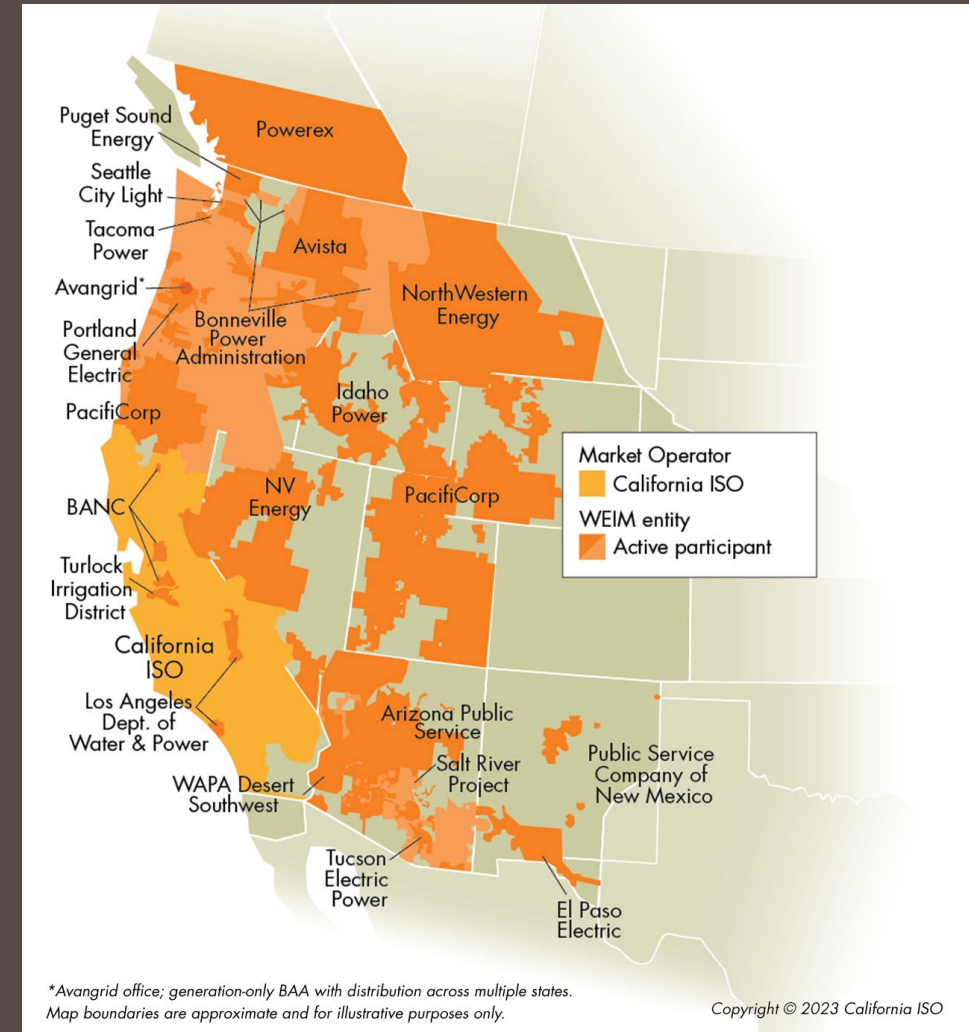
What is SMUD's Market Footprint?

• **Bi-Lateral Market** — SMUD participates in energy markets in the Western Interconnect - from the Rocky Mountains west including parts of Canada and Mexico. Transactions from next hour to years' long complex Power Purchase Agreements (PPAs).

• CAISO Energy Imbalance Market (EIM) -

The EIM's advanced market system automatically finds low-cost energy to serve real-time consumer demand across the west. Since its launch in 2014, the EIM has enhanced grid reliability and generated cost savings for its participants. Besides its economic advantages, the EIM improves the integration of renewable energy, which leads to a cleaner, greener grid.

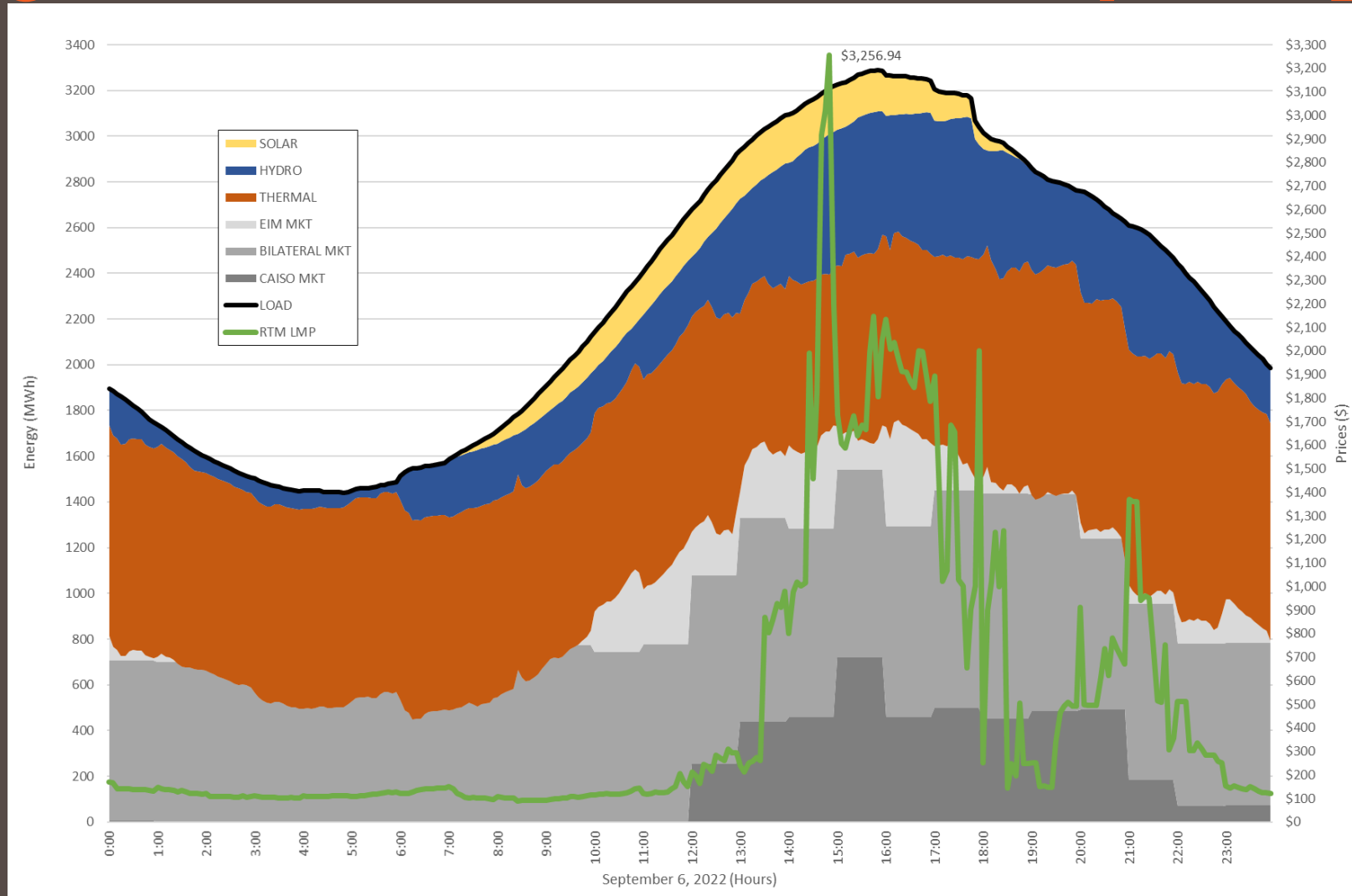
The EIM serves as SMUD's primary Realtime Energy Market. SMUD went live in April of 2019 with the remainder of Balancing Authority of Northern California (BANC) joining in March of 2021.



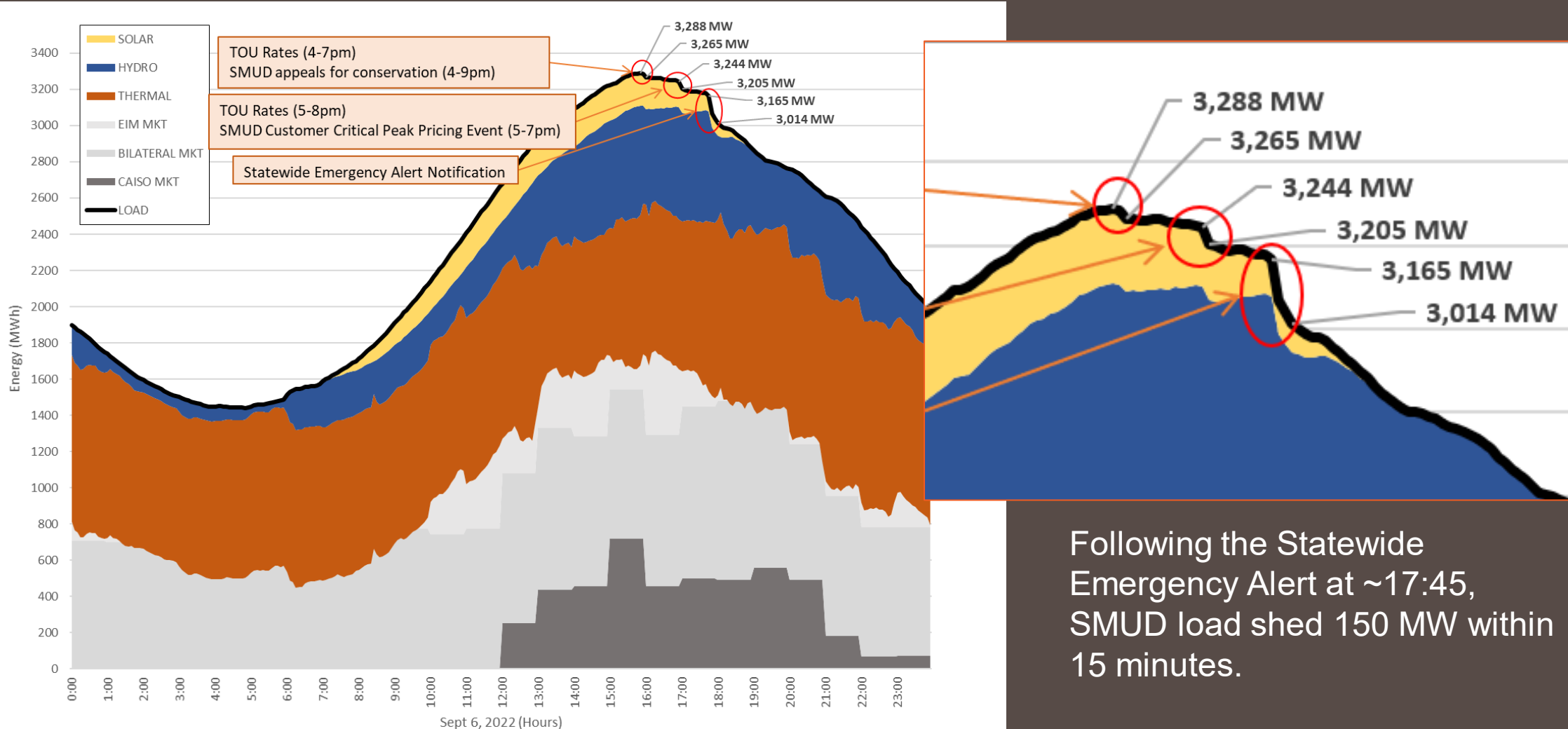
2022 Summer Recap

- SMUD summer operations were strained following the extended forced outage for Cosumnes Power Plant (CPP) from early June through March 2023.
 - The plant was able to operate in a limited mode during peak demand periods of strained operations and system emergencies.
- SMUD had a peak load of 3,288 MWs at 4pm on September 6th, 2022
 - BANC set all time peak as did CAISO on September 6th, 2022
 - SMUD all time peak is 3,299 MWs set on July 24, 2006
- A turbulent 2022 water year defined by early atmospheric rivers followed by a record-breaking dry winter resulted in summer elevation restrictions that constrained hydro operations as California endured a third year of drought conditions
- With the exception of the September heat storm, summer 2022 brought mild conditions

Serving SMUD Load on a Peak day – Sept 2022



A Closer Look at Sept Peak Events



Following the Statewide Emergency Alert at ~17:45, SMUD load shed 150 MW within 15 minutes.

Summer 2022 Resource Adequacy (RA) Plan set up review: CPP outage drove considerable changes

	Jul – 22 Plan	% of Portfolio	Jul – 22 Actual	% of Portfolio	Change
Load	2,874		2,874		0
RA Obligation	3,255		3,256		1
Resource Locations					
SMUD/BANC	2,150	65.9%	1,581	48.2%	(569)
<i>SMUD Gen</i>	1,892	58.0%	1,323	40.3%	(569)
<i>Sutter</i>	258	7.9%	258	7.9%	0
CAISO	417	12.8%	503	15.3%	86
<i>Energy (Renewable Portfolio Standard)</i>	167	5.1%	167	5.1%	0
<i>Non-RA</i>	250	7.7%	336	10.2%	86
Western Area Power Admin	298	9.1%	308	9.4%	10
Pacific Northwest	337	10.3%	830	25.3%	493
Desert Southwest	59	1.8%	59	1.8%	0
Diversity Benefit	0	0.0%	0	0.0%	0
Total Resources	3,261		3,279		18

Reductions

Additions

Comparing 2023 initial set up to 2022 initial set up for Resource Adequacy (RA)

	Jul – 22	% of Portfolio	Jul – 23	% of Portfolio	Change 2022-2023
Load	2,874		2,806		(68)
RA Obligation	3,255		3,178		(77)
Resource Locations					
SMUD/BANC	2,150	65.9%	2,142	67.3%	(8)
<i>SMUD Gen</i>	1,892	58.0%	1,884	59.2%	(8)
<i>Sutter</i>	258	7.9%	258	8.1%	0
CAISO	417	12.8%	558	17.5%	141
<i>Energy (Renewable Portfolio Standard)</i>	167	5.1%	308	9.7%	141
<i>Non-RA</i>	250	7.7%	250	7.9%	0
Western Area Power Admin	298	9.1%	383	12.0%	85
Pacific Northwest	337	10.3%	37	1.2%	(300)
Desert Southwest	59	1.8%	60	1.9%	1
Diversity Benefit	0	0.0%	4	0.1%	4
Total Resources	3,261		3,184		(77)

Reductions

Additions

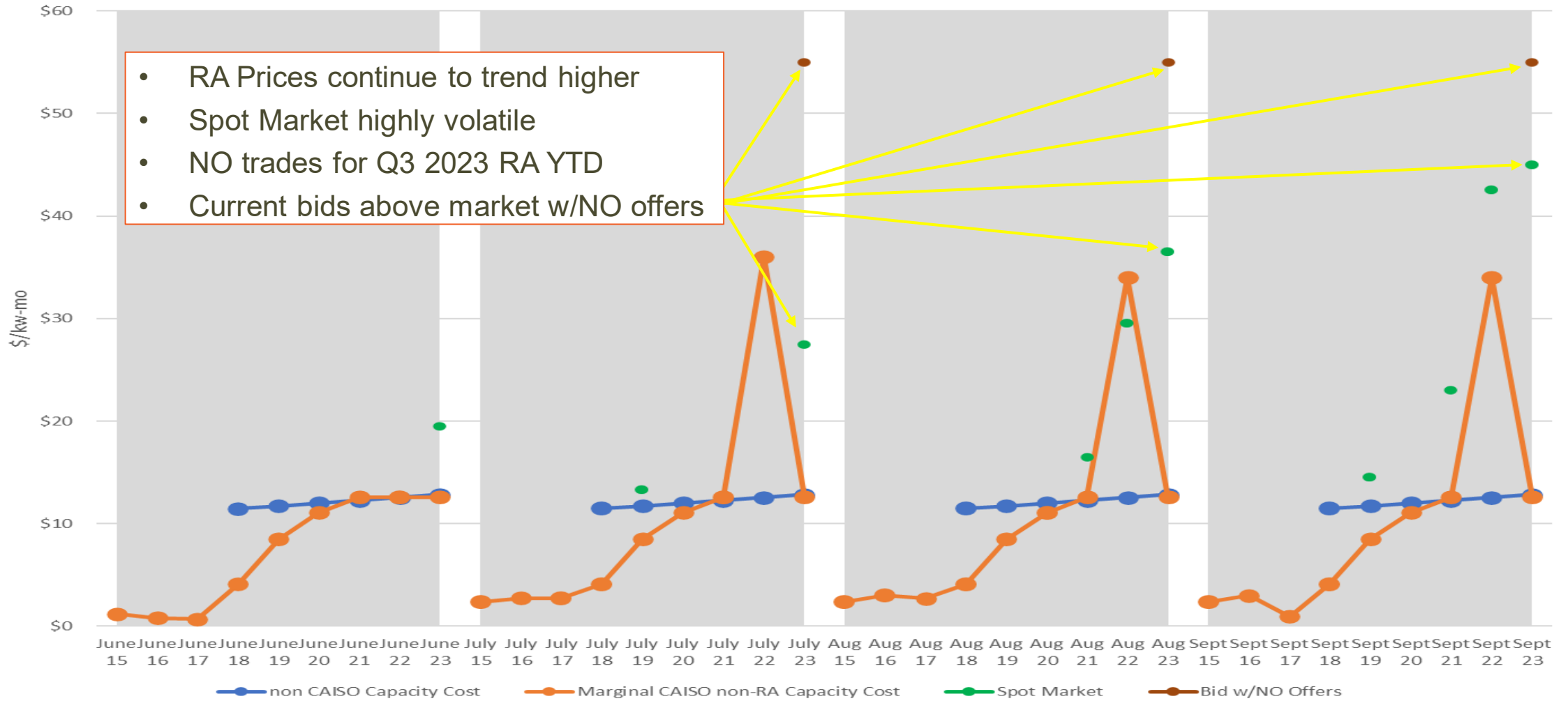
- Geysers (CAISO)
- Drew Solar (CAISO)
- WAPABR (WAPA)

Resource Adequacy 2H 2023 (All Months Filled)

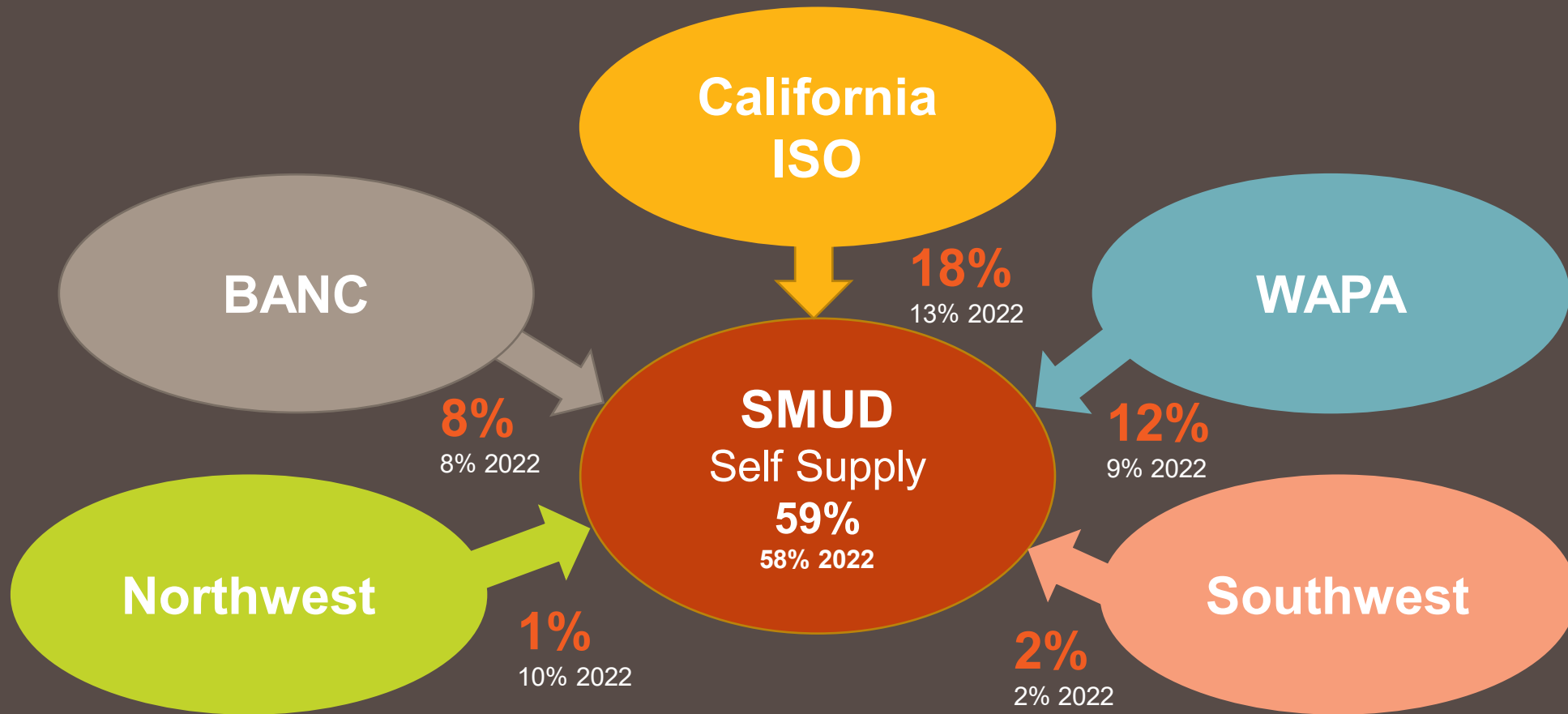
	23-Jul	23-Aug	23-Sep	23-Oct	23-Nov	23-Dec
Load	2,764	2,709	2,490	1,664	1,409	1,543
RA Obligation	3,178	3,066	2,814	1,946	1,653	1,807
SMUD/BANC						
	2,142	2,141	1,961	1,770	1,895	2,017
<i>SMUD Gen</i>	1,884	1,883	1,703	1,512	1,637	1,759
<i>Sutter</i>	258	258	258	258	258	258
CAISO	558	565	520	335	266	254
<i>Energy (Renewable Portfolio Standard)</i>	308	315	270	210	141	129
<i>Non-RA</i>	250	250	250	125	125	125
Western Area Power Admin	383	362	307	270	233	232
Pacific Northwest	37	41	43	19	19	19
Desert Southwest	60	68	73	82	95	100
Diversity Benefit	4	-14	-17	25	-46	-42
Total Resources	3,184	3,163	2,887	2,501	2,462	2,580

RA Prices

Resource Adequacy Costs

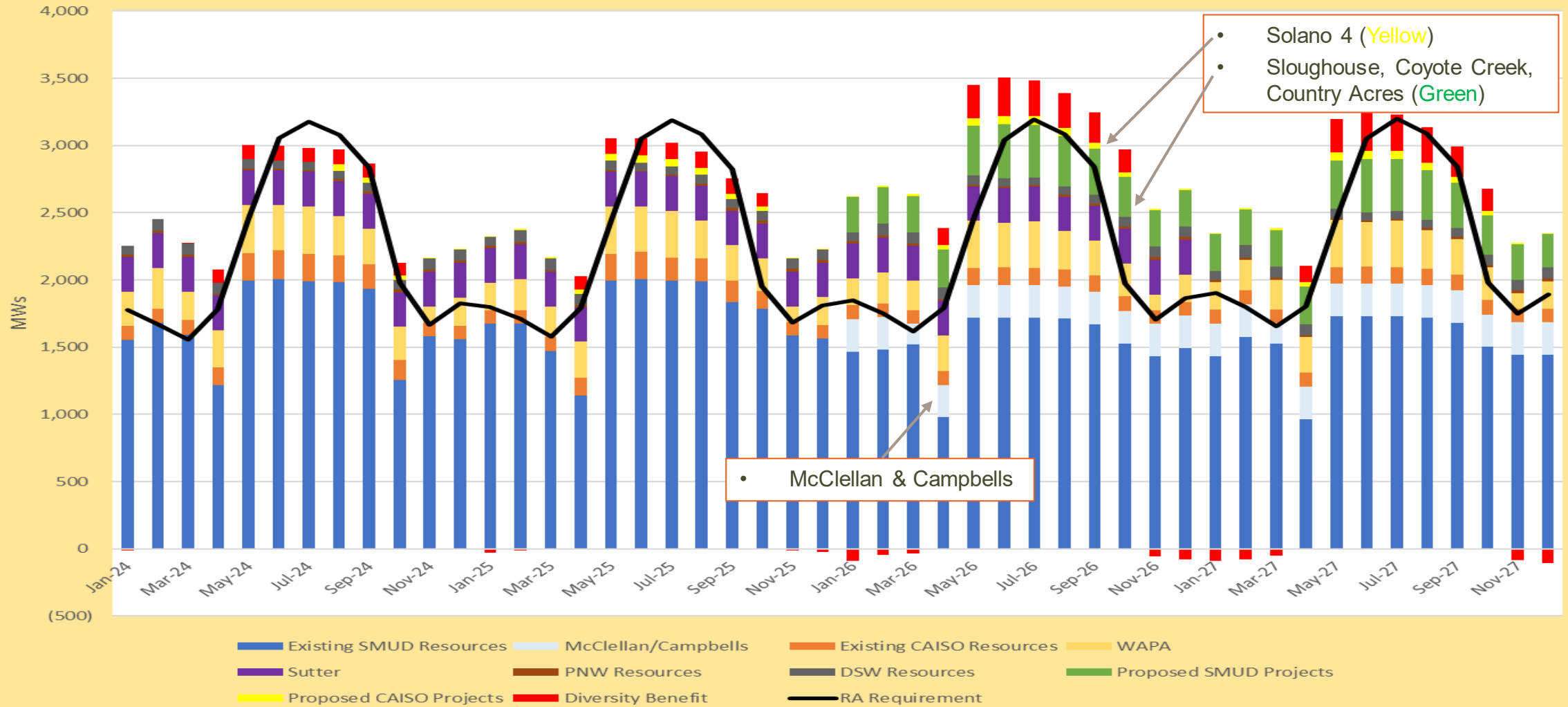


Geographic Diversity of 2023 RA Plan



Resource Adequacy 2024-2027

RA Position 2024-2027



Market Outlook Summer 2023

- BANC/SMUD Summer Readiness – Cautiously Optimistic
- RA Market pricing continues to be at historic highs
 - September 2023 RA broker quote @ \$45.00 KW/month
- Market uncertainty is reflected in elevated energy prices
 - Northwest Heavy Load for July 2023 currently @ \$147.00 (July 2022 @ \$134.00)
 - Northwest Heavy Load for August 2023 currently @ \$235.00 (Aug 2022 @ \$217.00)
 - Natural Gas prices are a bit lower for 2023 easing some pressure on power prices (July 2023 \$5.87, July 2022 \$8.62)
- Required Actions
 - None for RA, all months compliant. Will utilize financial hedges to address forward looking energy imbalances to provide price protection.

Market Outlook Summer 2023 - Continued

There are three important regions to consider for hydrological conditions:

- Upper American River Project (UARP) – SMUD-owned hydro generation
- Western Area Power Administration (WAPA) Central Valley Project (CVP) – hydro generation contracted with WAPA from across California
- Pacific Northwest (PNW) - hydro generation in Oregon, Washington and British Columbia

Area (as of 4/1/2023)	Precipitation as snowpack (% of normal)	Precipitation as rain (% of normal)
UARP	158	161
CVP	232	122
PNW	118	92

California drought conditions improved following an above normal snowpack and rainfall during the Winter and Spring of 2023.

Energy Prices

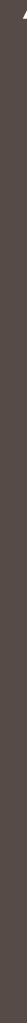
COB HL	2021	2022	2023	2024	2025
Jul	\$119.38	\$115.83	\$147.00	\$178.55	\$179.35
Aug	\$141.55	\$202.48	\$235.10	\$222.95	\$202.40
Sep	\$95.48	\$141.53	\$187.70	\$168.30	\$167.95
Q3	\$118.80	\$153.28	\$189.93	\$189.93	\$183.23

NP HL	2021	2022	2023	2024	2025
Jul	\$100.55	\$120.80	\$112.20	\$128.95	\$135.05
Aug	\$114.38	\$159.18	\$142.60	\$144.95	\$141.00
Sep	\$88.25	\$135.35	\$135.45	\$129.90	\$134.15
Q3	\$101.06	\$138.44	\$130.08	\$134.60	\$136.73

- 2021- 2023 are of as April of each year
- 2024 – 2025 are as of April 2023

Additional Pressure on Supply/Demand

	Pressure on Prices
Thermal Plant Requirements	↑
Higher CPUC RA Requirements	↑
Revised Effective Load Carrying Capabilities (ELCC) and Net Qualifying Capacity (NQC)	↑
Market Rule Changes	↑
Northwest RA program	↑
Community Choice Aggregator Maturity	↑
Battery Storage Build Out	↓
State Initiatives	↓



Questions

