Item 4
PRESENTATION

Monthly Reach Code Update

Zoe Elizabeth
February 2023

SILICON VALLEY CLEAN ENERGY

Objective

1. Recap 2023 reach code initiative results
2. Introduce next steps

13/13 jurisdictions adopted a reach code.

2022 SVCE Reach Codes

Jurisdiction		
Campbell	All Electric	⬆
Cupertino	All Electric	
Gilroy	Increased minimum EVCI requirements	⬆
Los Altos	Mostly Electric	
Los Altos Hills	Mostly Electric	
Los Gatos	All Electric	
Milpitas	All Electric	⬆
Monte Sereno	Mostly Electric	⬆
Morgan Hill	All Electric	⬆
Mountain View	All Electric	
Santa Clara County Unincoporated	All Electric	
Saratoga	Mostly Electric	
Sunnyvale	All Electric	

⬆ Indicates strong Improvement in reach Code requirements Compared to last cycle.

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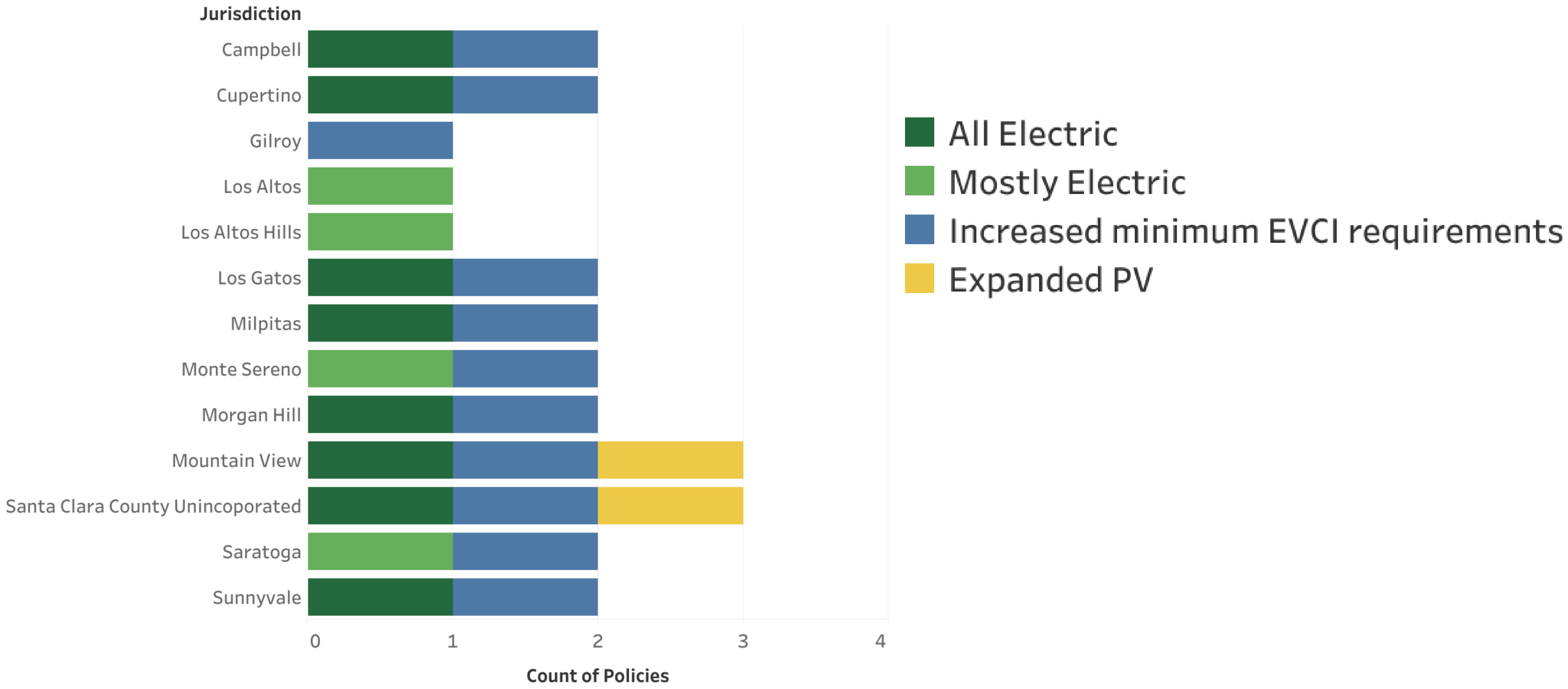
Eight jurisdictions adopted an all -electric code. Eleven jurisdictions adopted an EV code.



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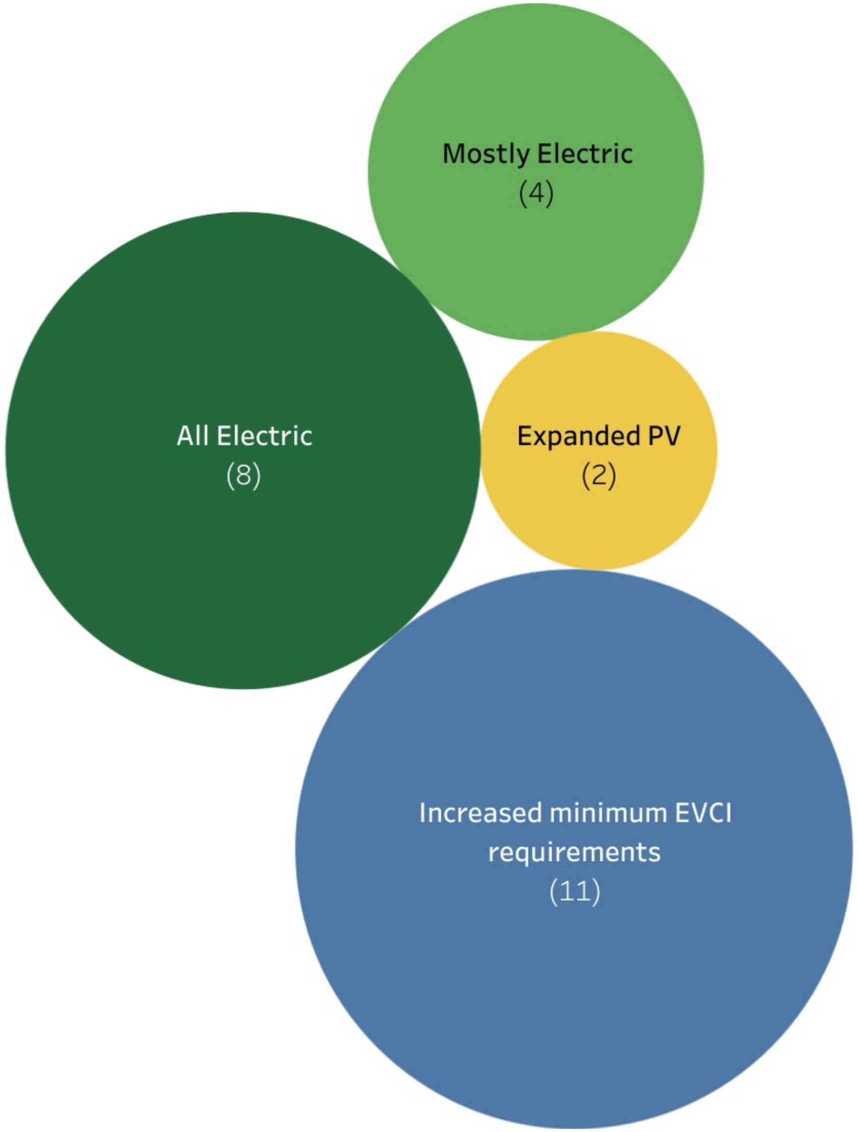
2022 Count of Reach Code Policies



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Congratulations!!!

- Thanks to you, the future will be healthier, safer, and more resilient.
- All cities are eligible to receive the $10K grant to support the staff effort.
- Every building official/staff lead will also receive a certificate of appreciation.

We look forward to continuing to work with you, your staff, and your community members to upgrade to clean, modern, electric buildings and transportation!

Next up...existing buildings

We are here to support you, your staff, and your community in the transition to clean and healthy all-electric buildings.

Winter 2023

- SVCE compiling data and resources on the challenges and opportunities to electrify buildings.
- SVCE staff conducting stakeholder interviews with agency staff and other experts.

Spring 2023

- In-person workshops for electeds and for staff
- Launch $1.5M grant program to support local policy development and adoption

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Thank you!

svcleanenergy.org

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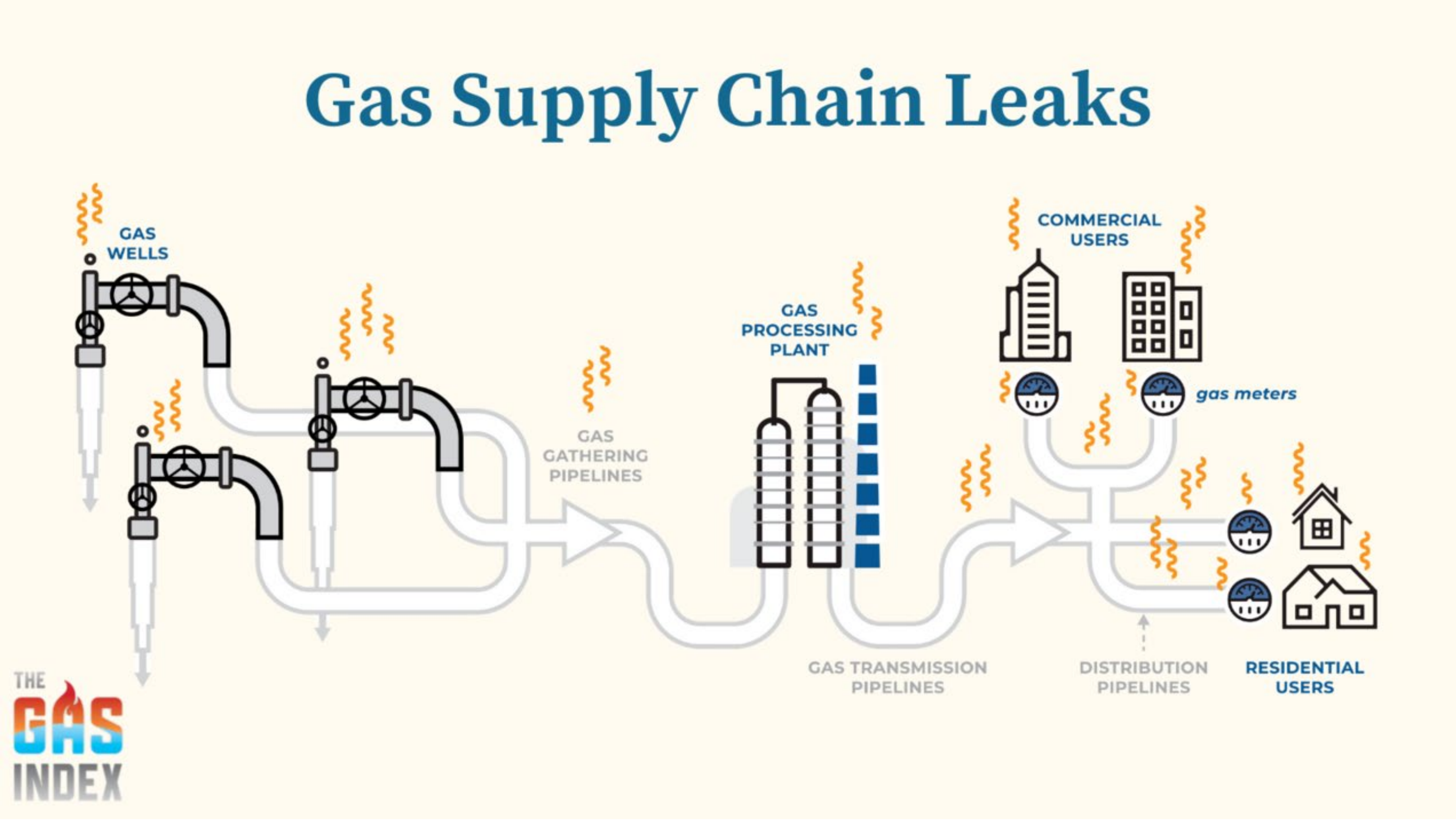
The 2022 State Code is Electric Preferred.

New Construction Energy Code (Part 6)

- Electric heat pumps are prescribed for:
  - Residential HVAC
  - Nonresidential – most include one or both of water heating and HVAC, depending on building type
- Residential
  - Performance credit for all-electric buildings
  - Required higher ventilation rate for gas stoves
  - Pre-wiring required for residential dwellings
  - Energy storage readiness
- Nonresidential - Solar PV and Battery Storage required

Even small gas appliances require a large, expensive distribution system.

A gas range is not just a gas range. It is the tailpipe of a complex system.



Source: The Gas Index, 2020

Reach codes help your community prepare for the electric future.

Any natural gas appliances installed today becomes a costly stranded assets
.

Illustrative example:

Assume 3500 new housing units are built per year for the next three years with gas cooking and gas water heating. A future incentive program to replace these appliances would cost:

- $5.25M for cooktops ($500 incentive)
- $21M for water heaters ($2000 incentive)

<u>Plus:</u> Building all -electric today can be less expensive than building mixed fuel.

Six jurisdictions have an all -electric code and six have a code with at least one exception.

Type		How it works	SVCE Members
Building	Electric Preferred	Allows mixed-fuel buildings with high energy performance. Electrification-ready panel and wiring in mixed-fuel buildings.	2 – Milpitas, Monte Sereno
	Mostly-Electric	Water and space heating must be electric, exemptions for other appliances. Electrification-ready panel and wiring in mixed-fuel buildings.	4 – Campbell (res), Los Altos, Los Altos Hills (res), Saratoga
	All-Electric	All appliances must be electric, with very limited exemptions.	5 – County of Santa Clara, Cupertino, Los Gatos (res), Mountain View, Sunnyvale
	Gas Ban	No gas hookup (via municipal ordinance). Limited exceptions.	1– Morgan Hill
	No Reach	Meet state code minimum requirements.	1– Gilroy

2022 Model Reach Codes – New Buildings

Code Approach	Benefits	Considerations
All-Electric Municipal Ordinance	• Avoids CEC review and approval • Flexible (i.e., timecertain or existing buildings policies can be included) • Avoids triennial cycle	• Must exceed future code updates to stay relevant (i.e., most effective for all electric with limited exceptions)
CALGreen – All-Electric amendment	• Avoids CEC review and approval	• Requires triennial update or more if intervening cycle

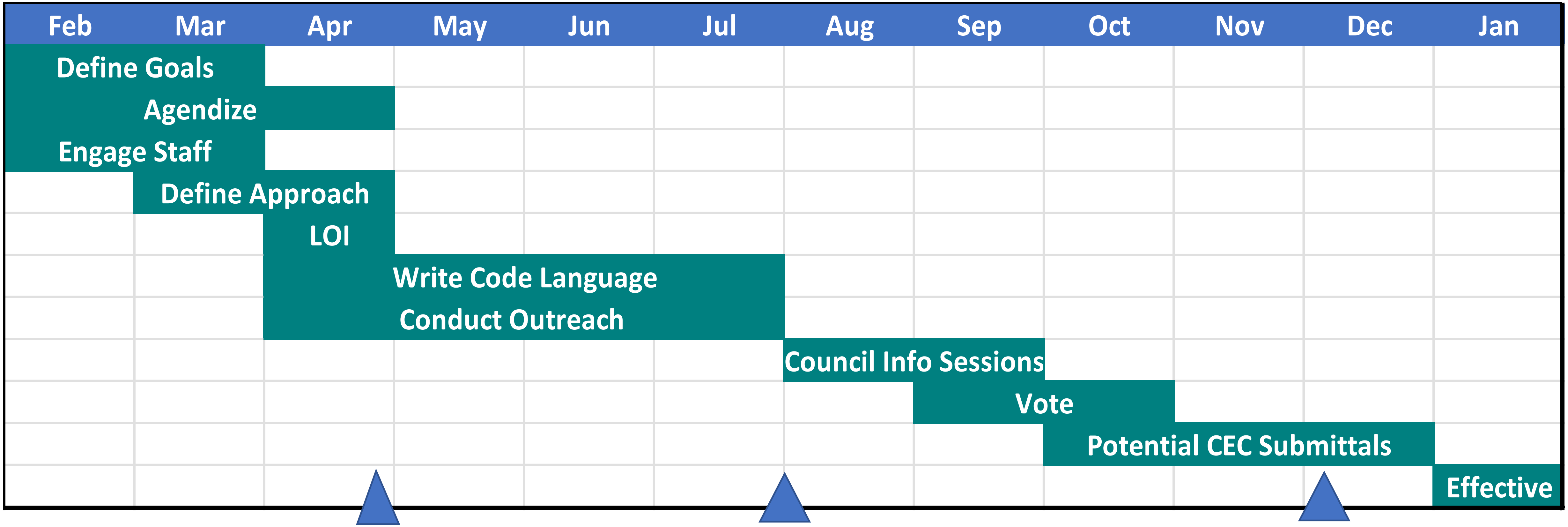
Model code language for both approaches can be found at BayAreaReachCodes.org

In Summary

- Our 2022 model code is all-electric to help our communities to prepare for an all-electric future.
- Member jurisdictions can tailor the codes with exceptions as they deem appropriate.
- The model code includes both an energy code amendment and the municipal ordinance option.

Your efforts matter. We look forward to supporting you.

Member Agency Reach Code Tasks and Milestones



Goals and Approach Defined
Reach Codes Agendized
City Manager LOI Signed
Staff Responsibilities Defined

Proposed Code language complete
Outreach conducted
Council informed

Final code language complete
Vote complete, same meeting as state code adoption
Documentation done

Orange text indicates a Boardmember task

Item 5
PRESENTATION
Added 2/9/23

Reliability Challenges, Opportunities, and Strategies

SVCE February 2023 Board Meeting

February 8, 2023

Presentation Objective

California's transitioning grid presents many challenges and opportunities to meet reliability

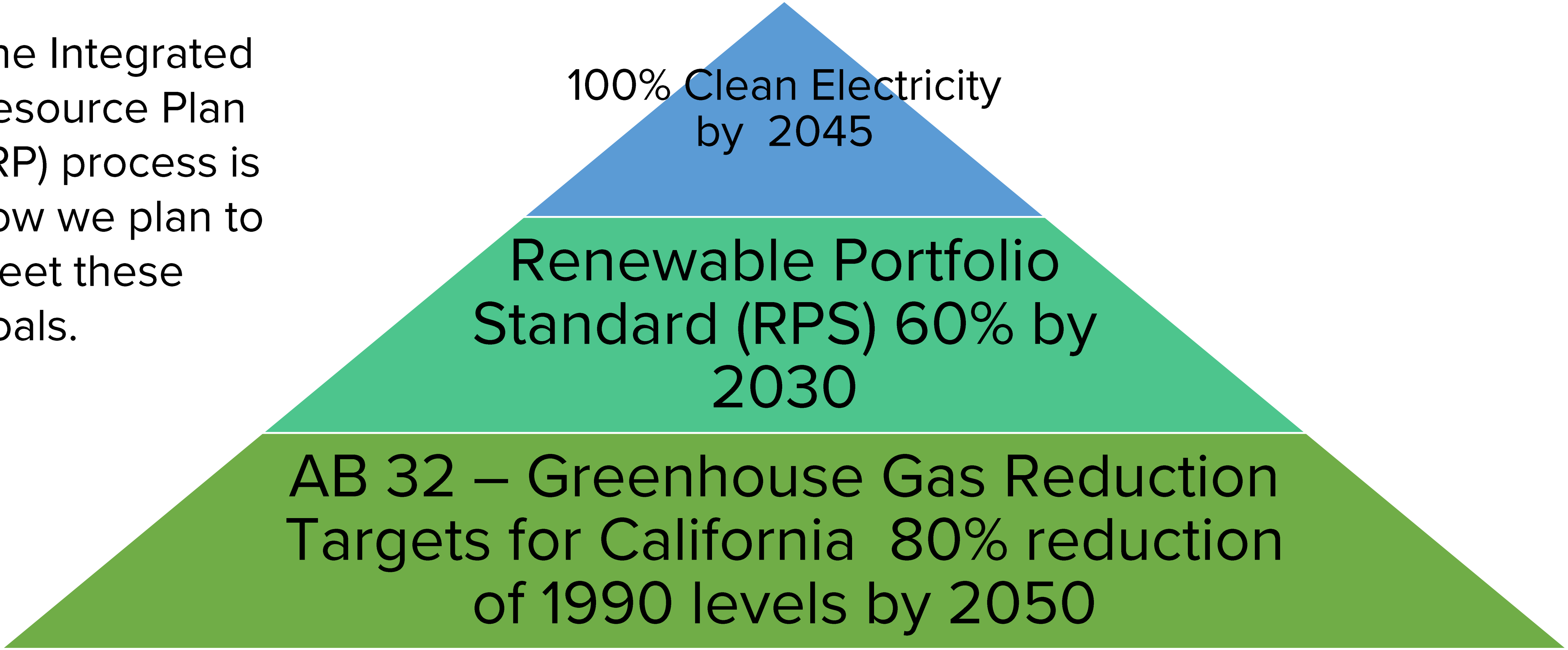
1. California's Clean Goals and Reliability
2. Challenges
3. SVCE's Portfolio, Procurement and Progress Efforts
4. New Opportunities and Strategies

California's Clean Goals, Reliability and Challenges

Transitioning to Clean Energy

California has set aggressive green house gas reduction targets and mandates to achieve them. SVCE is on track to meet these goals!

The Integrated Resource Plan (IRP) process is how we plan to meet these goals.



California's Power Fleet in Transition

To achieve aggressive greenhouse gas reduction goals, California must transition from a fossil based fleet to a clean source of electricity generation.

Past

Primarily Natural Gas, Coal Hydro and Nuclear

Present

Natural Gas, Hydro, Nuclear, Solar, Wind, Geothermal and limited Storage

Future

Solar, Wind, Geothermal, Hydro, Storage, Demand Response, Off-shore Wind & New Technologies. Less natural gas and no nuclear.

80,000 MW of Capacity currently on-line.

California’s Power Fleet in Transition

Presently Natural Gas power plants provide about 75% of the flexible capacity for grid reliability.

California has retired or plans to retire fossil fuel power plants. 8,000 MW of new Clean energy resources contracted or built.

Past

Primarily Natural Gas, Coal Hydro and Nuclear

Present

Natural Gas, Hydro, Nuclear, Solar, Wind, Geothermal and limited Storage

Future

Solar, Wind, Geothermal, Hydro, Storage, Demand Response, Off-shore Wind & New Technologies. Less natural gas and no nuclear.

California has issued several IRP Procurement Orders to ensure the state is on track to meet!

California's Power Fleet in Transition

Three times the amount of Solar and Wind and eight times of Storage over current rates of development are needed to achieve 100% Clean electricity by 2045.

Off-shore wind, demand response, longer-duration storage and hydrogen resources will play a part.

Past

Primarily Natural Gas, Coal Hydro and Nuclear

Present

Natural Gas, Hydro, Nuclear, Solar, Wind, Geothermal and limited Storage

Future

Solar, Wind, Geothermal, Hydro, Storage, Demand Response, Off-shore Wind & New Technologies. Less natural gas and no nuclear.

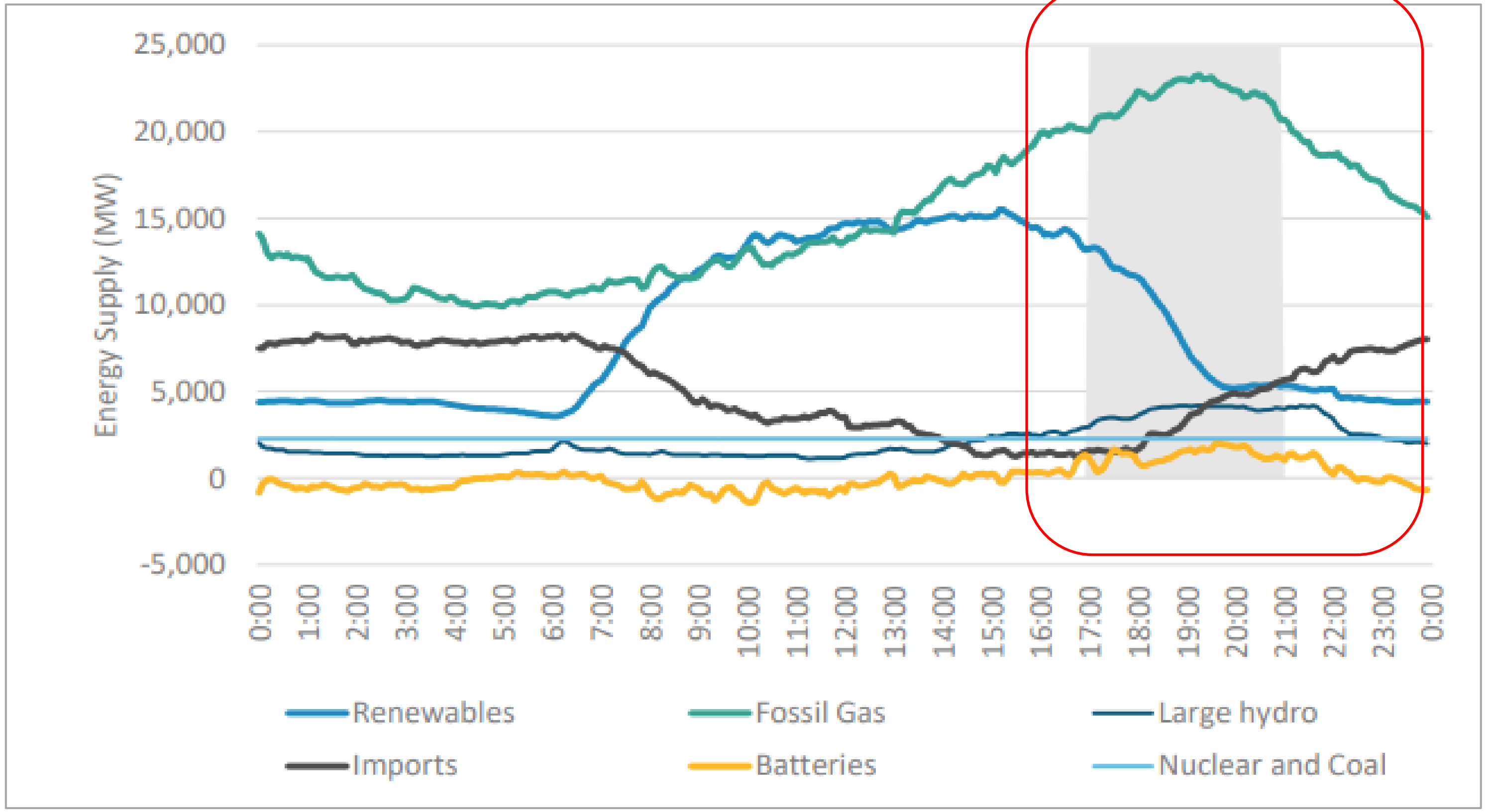
In total 180,000 MW of new clean capacity is needed by 2045!

Current State of Reliability

Climate change, droughts, changes in load and resources have put a focus on how we will meet Reliability

- The heatwave in September 2022, stressed the grid
- Load peaked in evening hours when Renewables ramped down
- Demand Response played a critical role in avoiding rolling blackouts
- Back-up generators were deployed

Source: 2022 Scoping Plan for Achieving Carbon Neutrality



Existing fossil gas generation continues to play a critical role in grid reliability on September 6, 2022

What is Reliability?

California energy agencies are charged with ensuring that there is sufficient energy and capacity available on the power grid to meet demands at all times

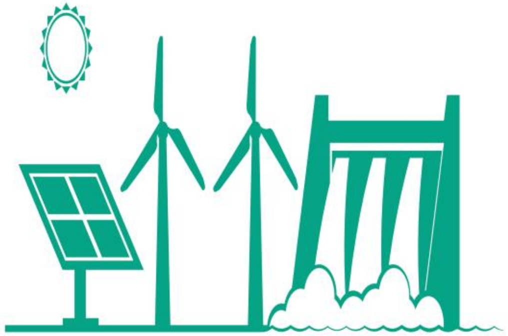
- **Capacity** is amount of electricity a Power Plant can produce at maximum output measured in megawatts (MW)

+

- **Energy** is the amount of electricity generated over time measured in megawatt hours (MWh)

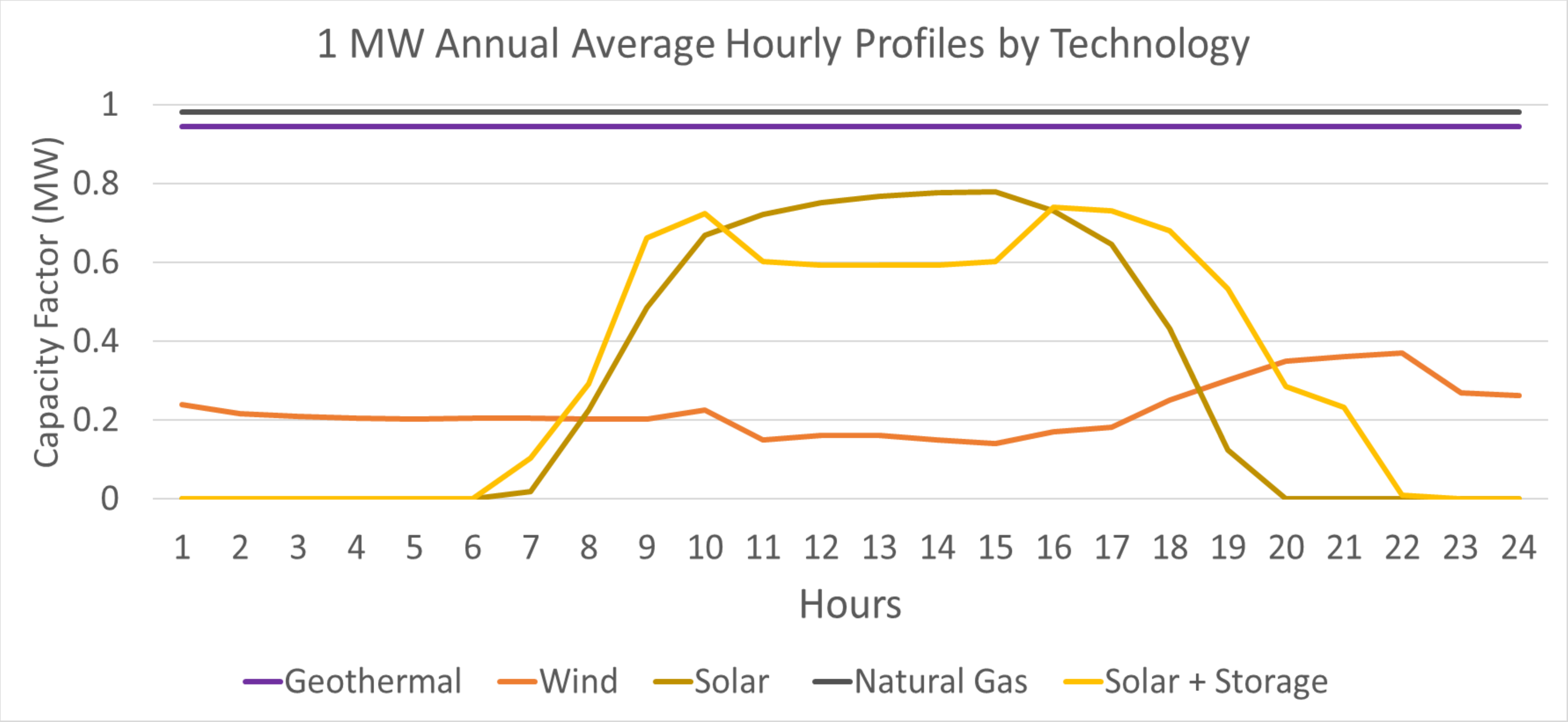
=

- **Reliability** is a measurement of how likely a resource is able to perform during certain periods of time



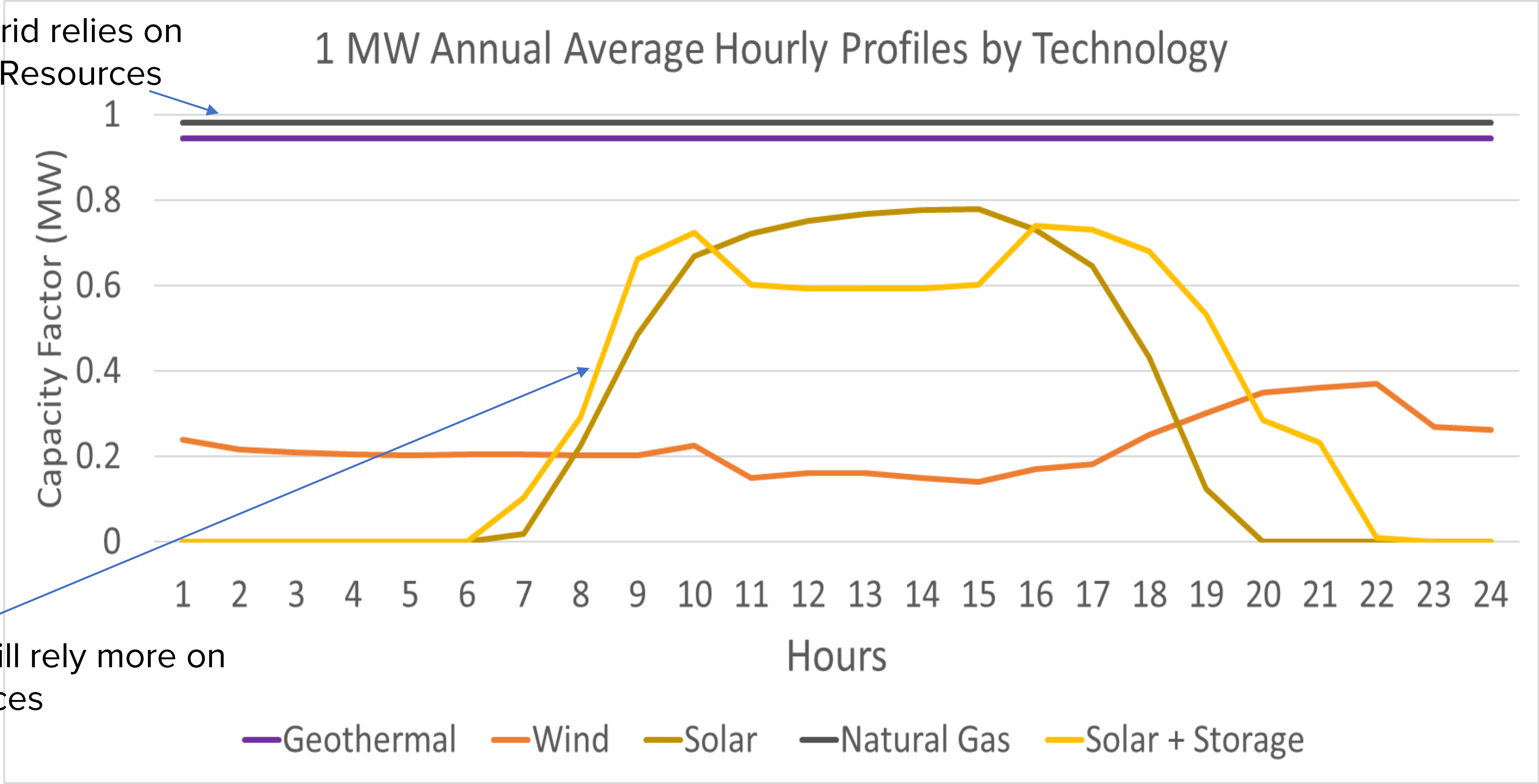
Clean Energy Generation Varies

Variations from different technology types of generation throughout the day, making it difficult to plan for and meet energy demands.



Clean Energy Generation Varies

Past and present grid relies on Fossil/Natural Gas Resources



Future grid will rely more on Clean resources

Energy versus Capacity

Energy represents the amount of electricity generated over time

- 100% of Clean Energy goal
  - Renewable Portfolio Standard (RPS)
  - Carbon-free, non-RPS
- Energy and Capacity can be bought together or unbundled
- Capacity-only resources, allow us to "rent" or claim the capacity for Reliability purposes
  - No Energy is associated with Capacity-only contracts
  - SVCE must procure Capacity contracts because renewable resources have little countable Capacity for Reliability

SVCE's Portfolio Objectives and Progress

Power Supply Products & Strategy

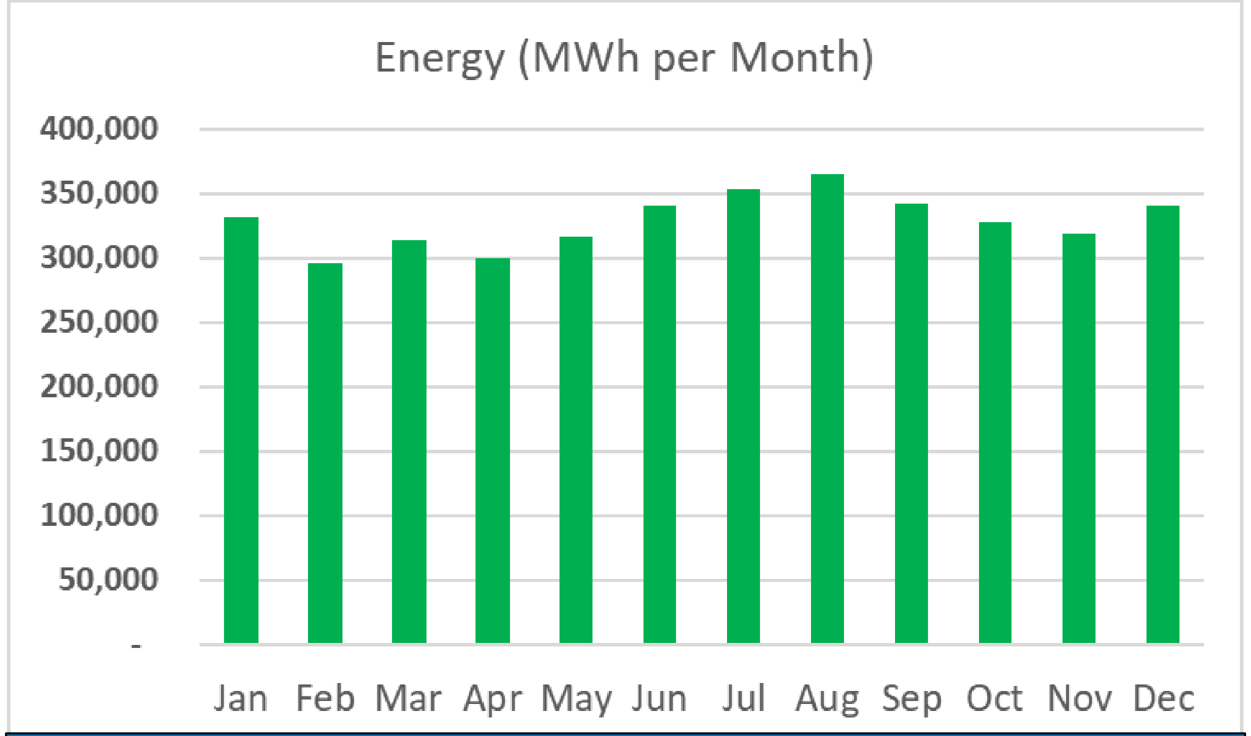
SVCE must procure electricity products to meet mandates and Board directives

	Energy	Capacity
Goal or Requirement	100% Clean RPS Reliability Procurement Mandates	Resource Adequacy Reliability Procurement Mandates
What We Buy	Hydro, Solar, Solar plus Storage, Geothermal and Wind	Natural Gas, Solar, Geothermal, Wind, Storage
How We Buy It	Long-term Power Purchase Agreements (PPA) and Short-term Resources	PPAs (bundled energy & capacity) Short-term RA capacity only, products

Load – Energy & Capacity/Demand

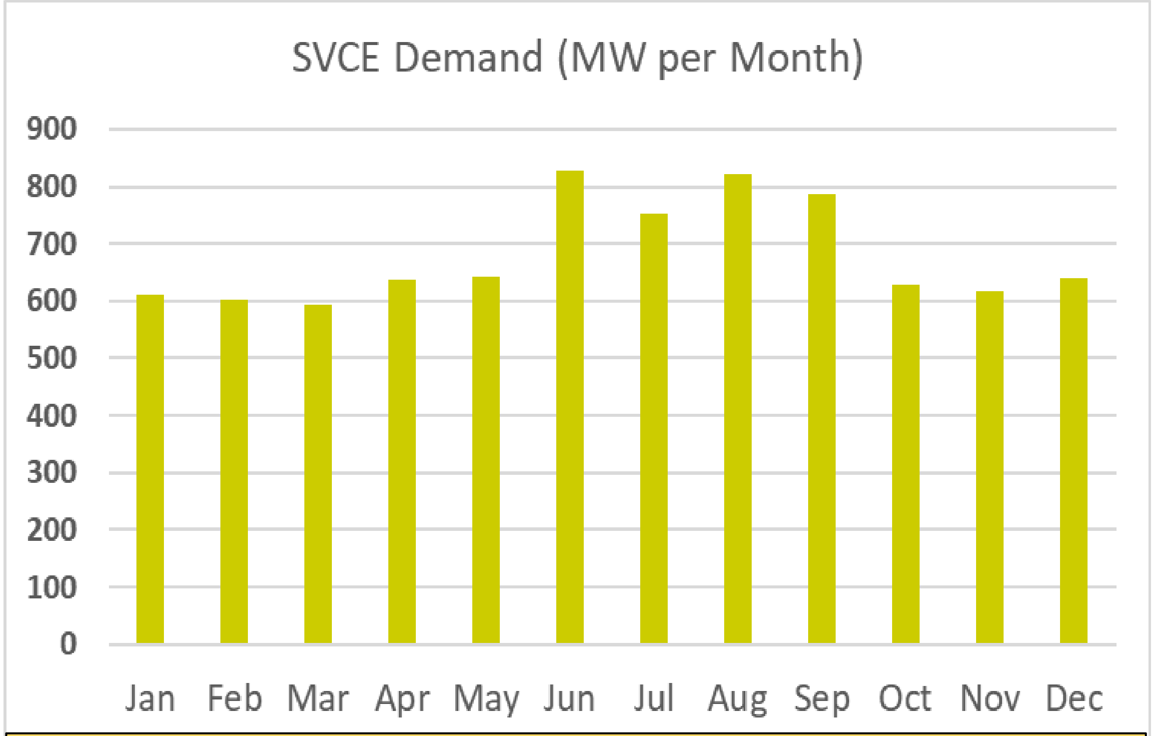
SVCE accounts for about 2.5% of the total CAISO Load

Annual Energy is ~4,000,000 MWh



100% Clean Energy Annually

Peak Demand is ~825 MWs



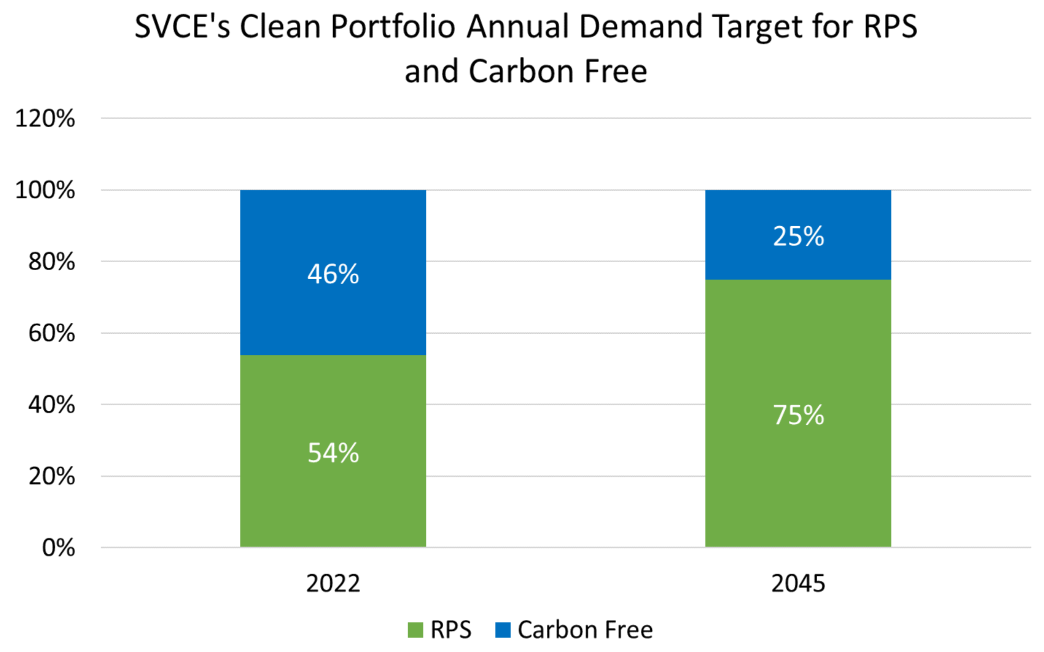
Reliability Capacity Requirements

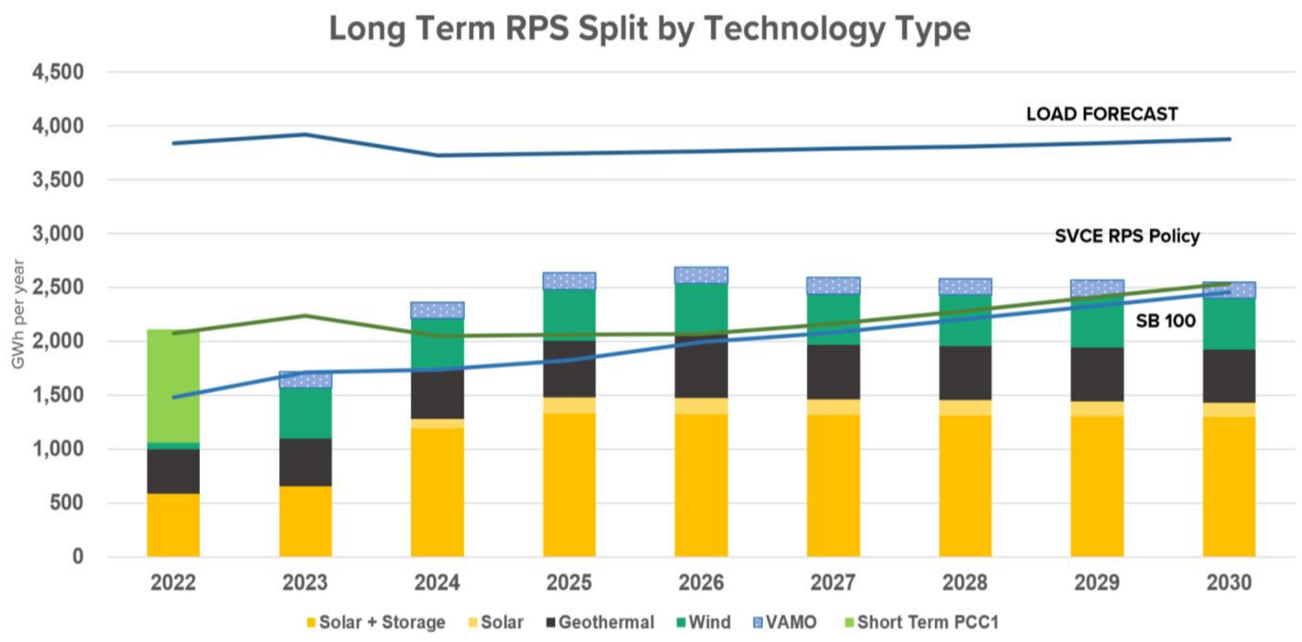
Clean Energy Resources

SVCE provides 100% Clean Energy on an annual basis through RPS and Carbon-free, non-RPS resources.

Increase in RPS to 65% in 2030 and 75% by 2045

On track to meet SVCE Agency RPS policy





California's Reliability Program

California has established a Resource Adequacy (RA) framework to ensure each load serving entity has sufficient Capacity to meet grid Reliability needs

1. California must ensure there is sufficient Capacity to meet Monthly Peak **Demand**
2. Plan for an adverse weather scenario
3. Meet a **Peak** Monthly Demand plus a buffer of 15% (Planning Reserve Margin)
4. All Resources are assigned reliability effectiveness factor
5. SVCE must comply with California's Resource Adequacy Program

Capacity

Resource Adequacy
Reliability Procurement Mandates

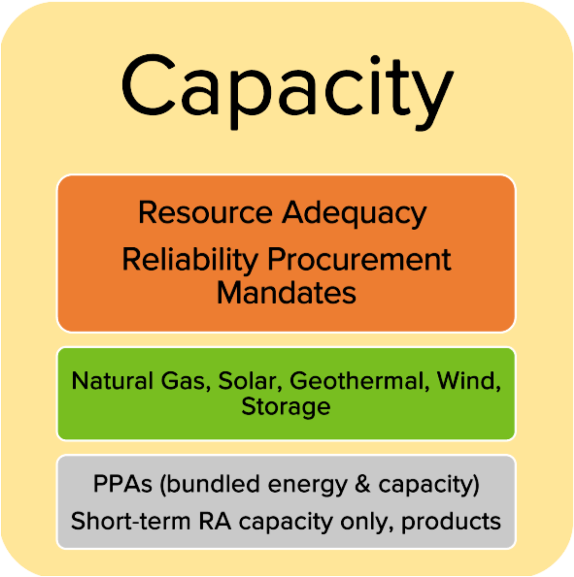
Natural Gas, Solar, Geothermal, Wind, Storage

PPAs (bundled energy & capacity)
Short-term RA capacity only, products

Resource Adequacy Only Capacity Contracts

Buyer has the rights to Capacity under a contract that ensures a resource generates when needed

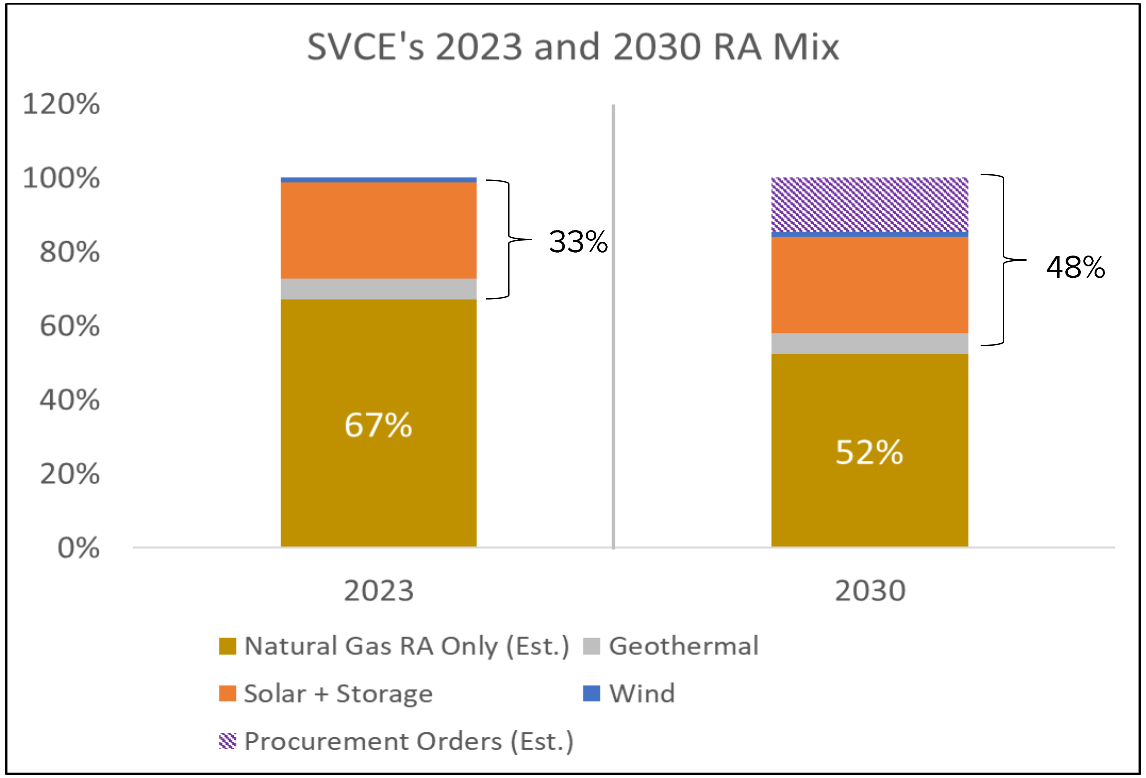
- No Energy associated RA Capacity
- These contracts serve to meet RA Program requirements
- RA-Only Capacity contracts primarily from natural gas resources
- Board has delegated authority to CEO to transact these types of contracts with less than 5 year terms

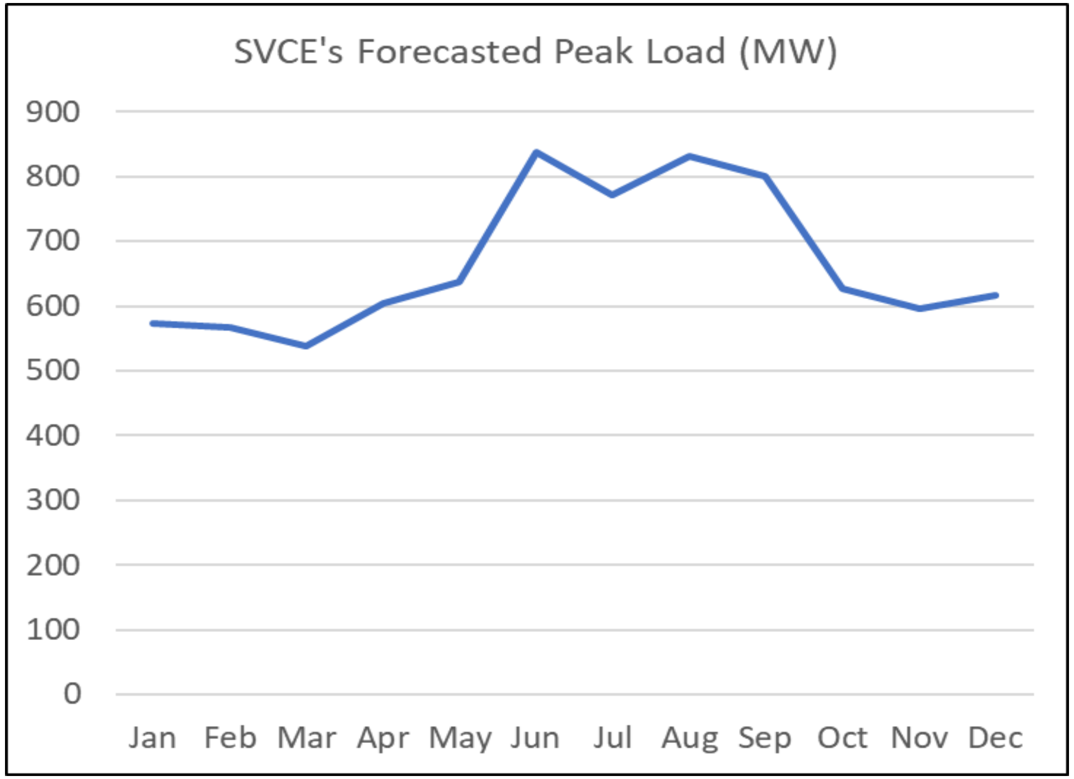


Purchasing Sufficient Capacity

Currently, SVCE buys mostly Capacity from Natural Gas Resources

The planning reliability with renewables may change, requiring more capacity and storage resources





Meeting short-term (2023-2025) Resource Adequacy Capacity Requirements is becoming a challenge

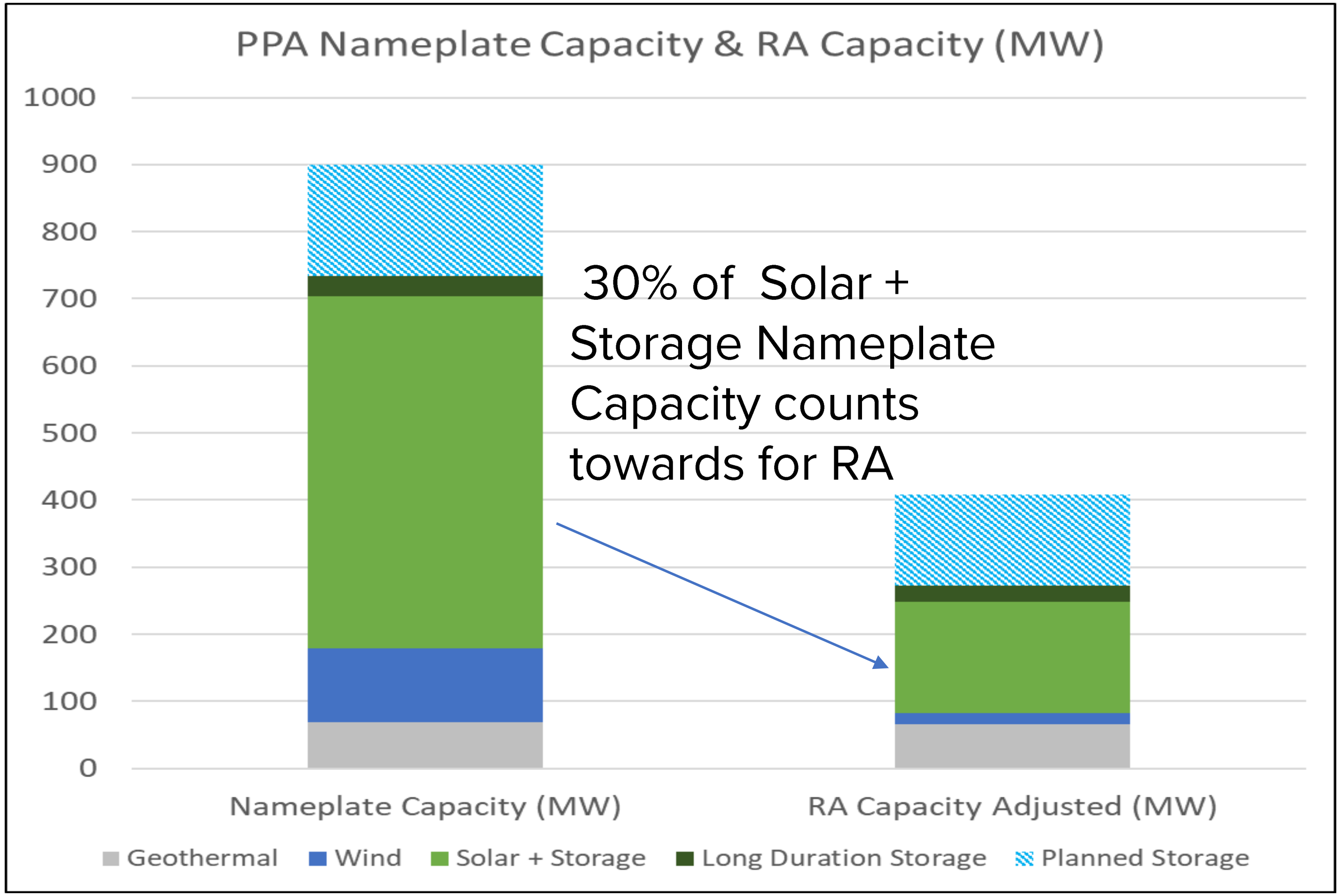
SVCE's PPAs and their RA Capacity

SVCE has over 900 MWs of Capacity from renewables that qualifies for about 408 MWs of RA Capacity

Typically SVCE's RA Capacity Requirement is 850 MWs

Additional 2000 to 2500 MW Nameplate Capacity if Solar + Storage resources

Typical lead time to build new renewable resources is 3-5 years



Alternative, Strategies & Opportunities to meet Reliability and Resource Adequacy Capacity Requirements

Building Blocks

How should we deploy resources to meet Reliability in a Clean and Affordable manner?

- Term of resources
- Ability to contract for and/or develop in time
- Capacity availability
- Role of Natural Gas in SVCE's portfolio
- RA Program Compliance
- New IRP Procurement Orders

Energy

100% Clean
RPS
Reliability Procurement Mandates

Hydro, Solar, Solar plus Storage, Geothermal and Wind

Long-term Power Purchase Agreements (PPA) and Short-term Resources

Renewables
- Mostly Energy

Carbon-free Resources
- Mostly Energy

Demand Response
- Shift/modify Load

Storage
- Capacity to shift Energy Resources

Natural Gas Resources
- Mostly Capacity

Capacity

Resource Adequacy
Reliability Procurement Mandates

Natural Gas, Solar, Geothermal, Wind, Storage

PPAs (bundled energy & capacity)
Short-term RA capacity only, products

How will we meet long-term Reliability?

A balance of technologies are to ensure we meet all portfolio objectives. To meet Reliability requirements, new strategies may be required.

Current Procurement		New Technologies/Opportunities
• Long-term Renewables Clean Energy with RA Capacity • Short-term (less than 5 years) RA-only mostly from Natural Gas • Storage (paired with solar and standalone 3-8 hour duration) • Demand Response	+	• Long-term RA-only (greater than 5 years) • Long-duration storage (non-Lithium Ion) • **Natural gas resources with RA capacity and energy ("gas toll")** • **Hybridized with Natural Gas Plant with battery storage**

Reliability Procurement Alternatives in addition to Current Procurement Strategy

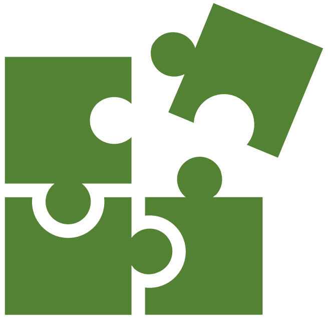
Alternative	Clean Energy	Meet Reliability	Affordable	Feasibility/Challenges
1. **Current – RPS PPAs, standalone storage and short-term RA-only products.**	+	+	+	Risk of not building or procuring sufficient capacity in time to meet current RA and Procurement Order requirements. Short-term RA market is highly constrained and expensive.
2. Rapid Increase Standalone Storage	+	+	+	Significant Increase in Portfolio Costs. Not feasible to build in the short term.
3. Increase Long-term RA-only capacity	+	+	+	Availability of long-term RA capacity is susceptible to shortages. Marketers preferred to sell Capacity and Energy long-term
4. Natural Gas Toll from Peaker plant	+	+	+	Emissions Costs
5. Natural Gas Toll from Peaker Plant w/BESS	+	+	+	Emissions Costs

Ability Meet Goals/Requirements Relative to Current **Most Likely** **Same** **Less Likely**

Challenges

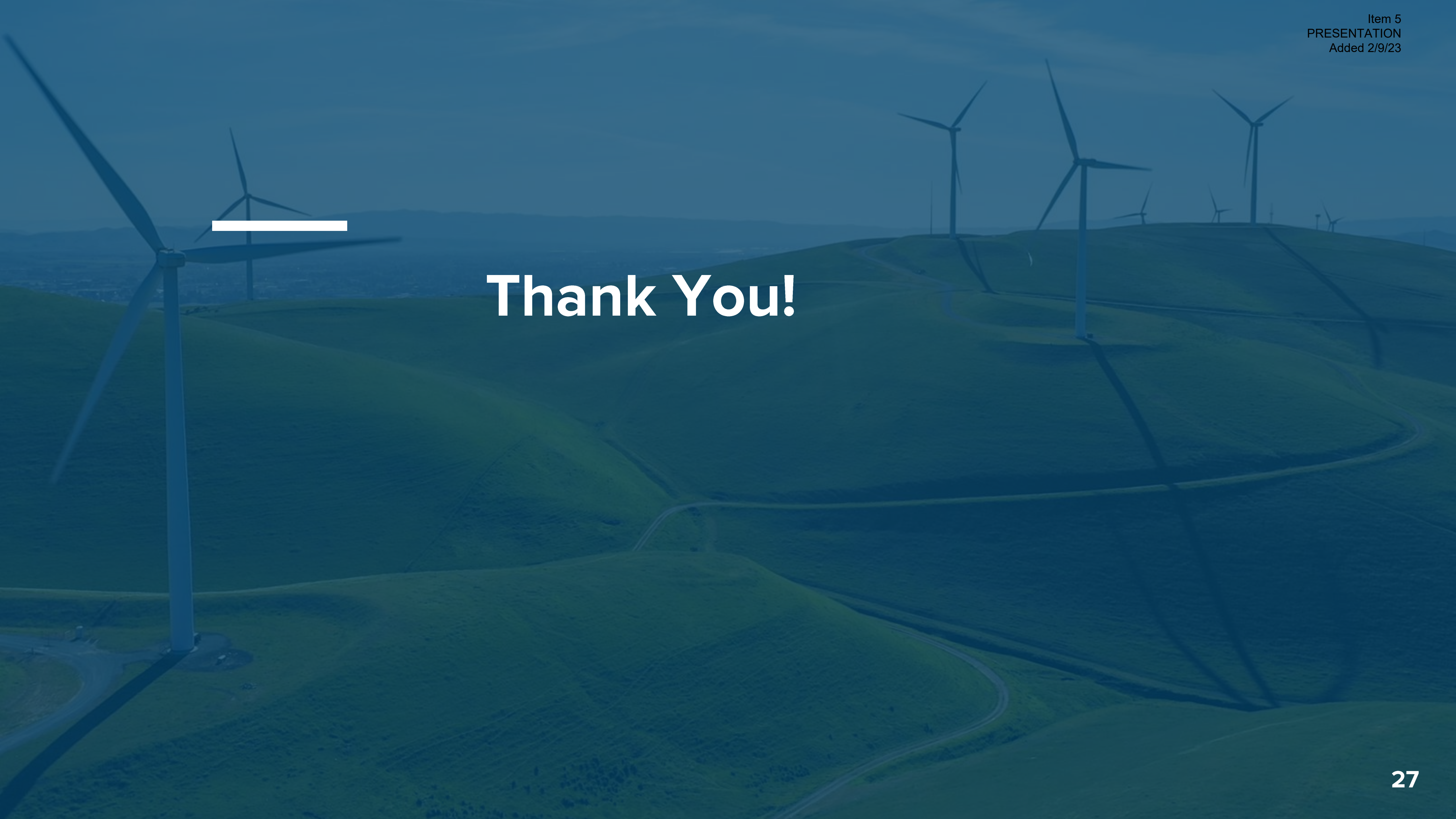
The ability to meet Reliability will become more difficult and costly putting into question the ability to meet climate goals affordably

1. Retirement of natural gas power plants
2. Reliance on RA-only Capacity contracts
3. Effectiveness of renewables to meet Reliability
4. Availability of large hydro and out-of-state resources
5. Electrification and changing load patterns
6. Resource Adequacy Reform to more granular requirements
7. Ability to quickly and cost-effectively build Clean Energy and Capacity resources
   1. Global supply and labor issues
   2. Interconnection and transmission upgrade backlogs



Near-term Initiatives

1. Continue to procure clean energy resources with and without capacity to meet Clean goals, RPS requirements, RA requirements and IRP Procurement Order(s)
2. Explore the availability and pricing of long-term RA-only capacity products to stabilize cost and increase ability to meet compliance under current and future RA framework
3. Explore opportunities to procure BESS-hybridized Natural Gas Peaker to meet RA requirements and hedge a portion of load cost
4. Pursue demand response and distributed energy resources for reliability
5. Assess ability and pathway to meeting 24x7 Carbon-free in a cost-effective, sustainable and reliable manner



Thank You!