

VCE Community Advisory Committee Meeting – September 22, 2022 via video/teleconference

Item 8 – Integrated Resource Plan (IRP) Update



# **Public Comments**

To Provide Public Comment on any agenda item please:

E-mail 300 words or less to: <u>meetings@valleycleanenergy.org</u>

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Join the Public Comment Queue by

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- Docket No. R.20-05-003
- Filing due November 1, 2022
- Commission (CPUC) Objective: reduce the cost of achieving greenhouse gas (GHG) reductions and evaluate existing and planned resource types in individual LSE portfolios to identify solutions to reliability, cost, or other concerns.
- IRP filings are the vehicle by which the CPUC and stakeholders gain insight into individual LSEs' plans for meeting state goals and how LSEs show compliance with their requirements under PUC 454.52(a)(1).
- The 2022 IRP is forward looking through 2035 with target years of 2030 and 2035.



# Item 8 – IRP Update: Filing Requirements

- Filing prepared using standardized tools, instructions, and templates
- New IRP developed every two years; CCAs requirement began in 2018
- Specific filing documents:
  - Narrative Template: describe how LSE approaches the process of developing its plan, present the result of analytical work, demonstrate to the CPUC and the stakeholders the LSE's action plan, and identify areas where the LSE is seeking Commission action to support their plan/procurement.
  - **Resource Data Template (RDT)**: collect LSE contracting data for existing, indevelopment and planned resources, including for future resources which do not exist yet. Provide a snapshot of the LSE energy and capacity forecast positions across the planning horizon.
  - Clean System Power Calculator (CSP): estimate the GHG and criteria pollutant emissions of LSE portfolios and verify that LSE portfolios achieve assigned GHG and reliability planning benchmarks.



# Item 8 – IRP Update: Outcomes

- Resource procurement plan optimized to meet variety of planning objectives at lowest cost
- Key factors:
  - Changing demand characteristics (weather/climate, electrification, etc.)
  - Technological advances (long-duration storage, offshore wind, EV, etc.)
  - Market developments (dynamic pricing AgFIT, aggregated Demand Response, etc.)
- Planning components:
  - Energy sales and power demand forecasts
  - GHG emissions targets
  - Reliability needs assessment
  - Resource Adequacy requirements
  - RPS & Long-term procurement requirements



# Item 8 – IRP Update: Modeling

- VCE's IRP is developed using a suite of fundamental modeling tools that provide capacity expansion modeling, production cost modeling, and local portfolio optimization
- For this IRP cycle, VCE has configured its models to align with the official inputs and assumptions made by the CPUC when available and has also included internal forecasts on expected market prices for capacity and energy in the future
- The CPUC assigns VCE forecasted values for energy consumption, peak demand, behind-the-meter solar, and electrification/demand-modification programs for each year through 2035
- VCE's existing portfolio of contracted resources is included in the model
- The model outputs a future resource portfolio that meets all the planning objectives and identifies the timing, quantity, and type of future resource needs
- VCE's influence over the model output is limited to establishing constraints on the quantity, timing, and type of resources selected by the model

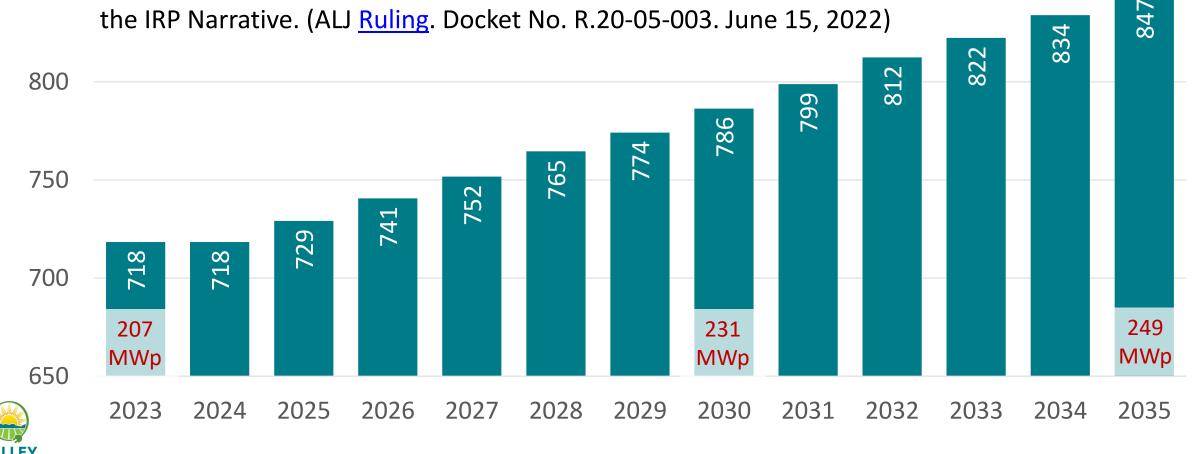


# Modeling Assumptions & Constraints



# Item 8 – IRP Update: CPUC Retail Energy Sales Forecast (GWh) for VCE

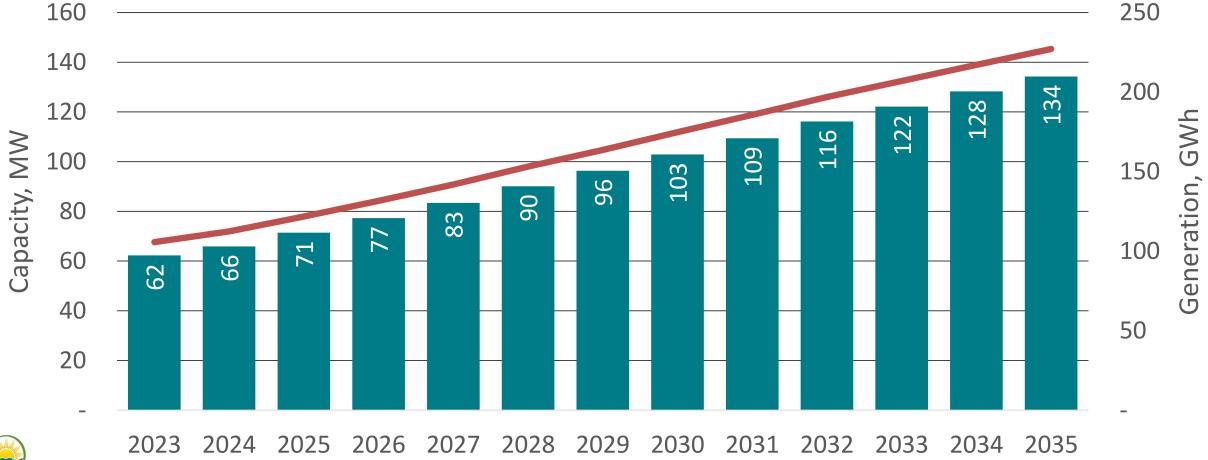
- Forecast based on California Energy Commission's (CEC's) Integrated Energy 900 Policy Report (IEPR) mid-case developed as the "single forecast set" per the interagency agreement among the CPUC, CEC, and CAISO. LSEs may address
- 850 the possibility of higher future loads in the electrification planning section of the IRP Narrative. (ALJ <u>Ruling</u>. Docket No. R.20-05-003. June 15, 2022)



# Item 8 – IRP Update: CPUC BTM PV Forecast for VCE

#### Capacity (MW)

—Generation (GWh) (measured at customer, not grossed up for T&D losses)





# Item 8 – IRP Update: CO<sub>2</sub> Emission Targets

- GHG targets for CO<sub>2</sub> emissions are based on LSEs' share of forecasted statewide retail energy sales
- LSEs are required to submit a portfolio meeting 2030 and 2035 targets for each scenario, but may submit a single portfolio that achieves the 2035 target of the "30 MMT in 2030 Scenario"
- VCE intends to submit a single portfolio that satisfies the most stringent planning target

38 MMT in 2030 Scenario	30 MMT in 2030 Scenario
<ul> <li>Based on Preferred System Portfolio</li></ul>	<ul> <li>Based on Core Scenario in the <u>SB</u></li></ul>
(PSP) adopted in <u>D.22-02-004</u>	<u>100 Joint Agency Report</u>
<ul> <li>VCE 2030 target (share of 38 MMT) =</li></ul>	<ul> <li>VCE 2030 target (share of 30 MMT) =</li></ul>
112,000 metric tons	85,000 metric tons
<ul> <li>VCE 2035 target (share of 30 MMT) =</li></ul>	<ul> <li>VCE 2035 target (share of 25 MMT)</li></ul>
88,000 metric tons	= 70,000 metric tons

# Item 8 – IRP Update: Marginal Reliability Need & Marginal ELCC values-30 MMT Scenario

Modeled Year

			(results complete)		merp	merpolarea rear						
Resource Class	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
In-state Wind (SoCal)	12%	14%	15%	11%	6%	8%	9%	8%	7%	6%	5%	4%
In-state Wind (NorCal)	24%	27%	31%	21%	12%	15%	19%	17%	15%	13%	11%	9%
Out-of-state Wind (WY/ID)	47%	45%	44%	38%	32%	33%	34%	33%	32%	31%	31%	30%
Out-of-state Wind (WA/OR)	29%	28%	27%	23%	20%	20%	21%	20%	20%	19%	19%	18%
Out-of-state Wind (AZ/NM)	42%	41%	40%	34%	29%	30%	30%	30%	29%	28%	28%	27%
Offshore Wind	67%	62%	56%	56%	55%	58%	61%	55%	49%	44%	38%	32%
Utility PV	12%	12%	12%	10%	8%	8%	7%	7%	7%	7%	7%	6%
BTM PV	5%	5%	4%	5%	6%	5%	5%	5%	5%	5%	5%	6%
4-hr Battery Storage	85%	86%	87%	85%	82%	85%	89%	79%	69%	60%	50%	40%
8-hr Battery Storage	89%	89%	88%	87%	86%	87%	89%	85%	81%	77%	73%	70%
Pumped Hydro Storage	90%	89%	88%	87%	86%	87%	89%	86%	83%	80%	76%	73%
Demand Response	77%	80%	82%	77%	73%	80%	86%	72%	58%	43%	29%	14%
Hydro (large)	51%	52%	53%	52%	51%	53%	54%	52%	50%	48%	45%	43%
Hydro (small)	36%	37%	38%	38%	37%	38%	39%	37%	36%	34%	32%	31%
Firm*	85%	86%	87%	87%	86%	85%	84%	86%	87%	88%	89%	90%

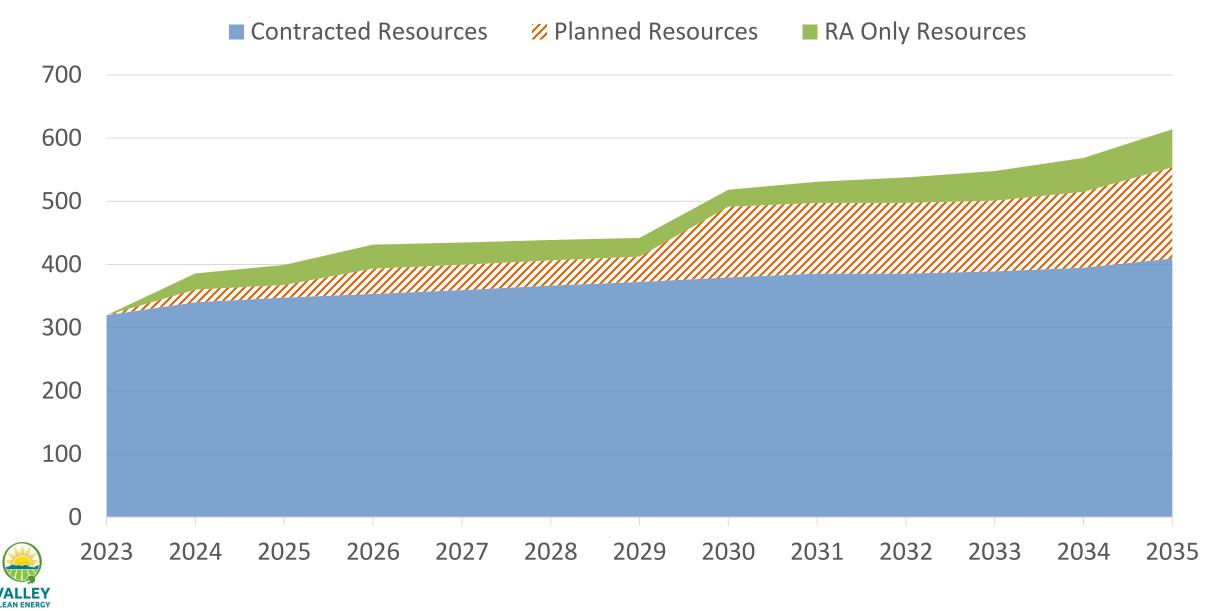


Marginal Reliability Need 47,112	48,652	50,193	49,099	48,005	49,369	50,732	49,261	47,790	46,318	44,847	43,376	
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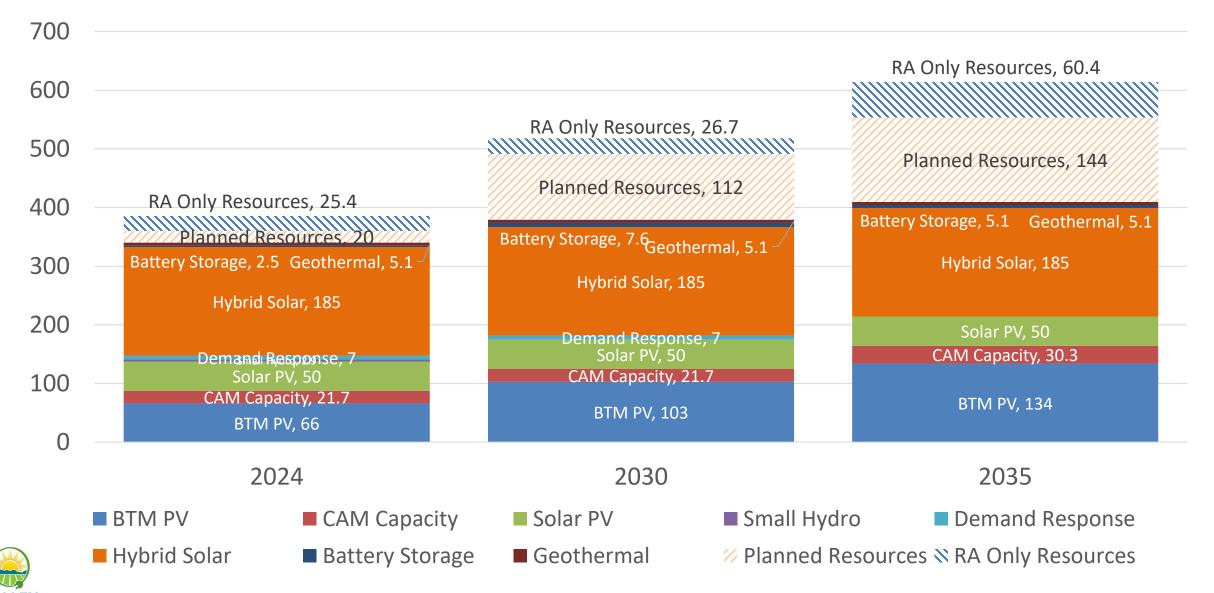
# IRP Results



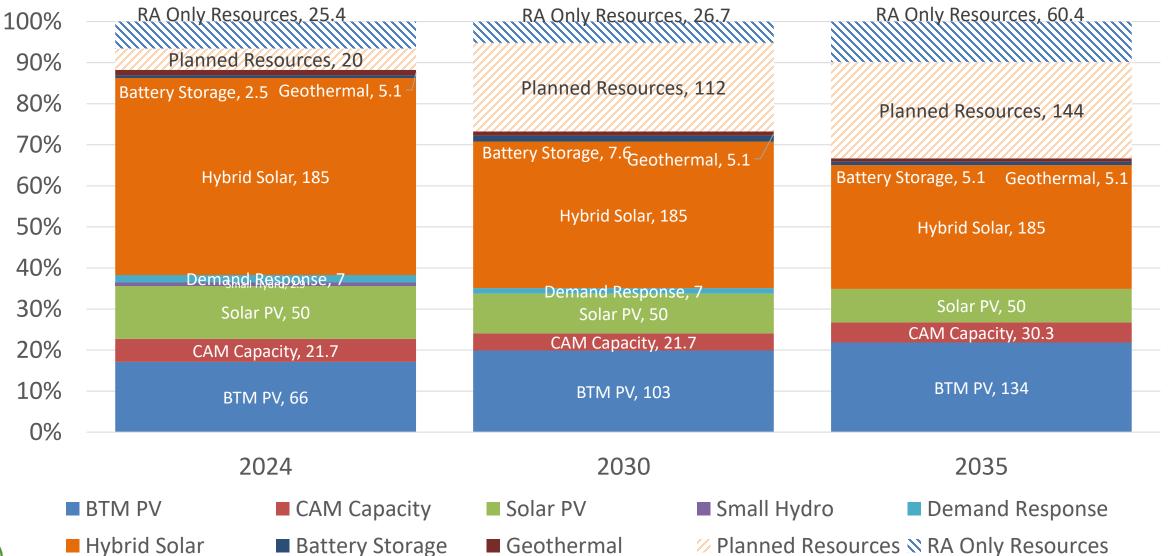
# Item 8 – IRP Update: VCE Contracted and Planned Resource Capacity, MW



# Item 8 – IRP Update: VCE Portfolio Resources by Type, MW



# Item 8 – IRP Update: VCE Portfolio Resources by Type, % share of portfolio





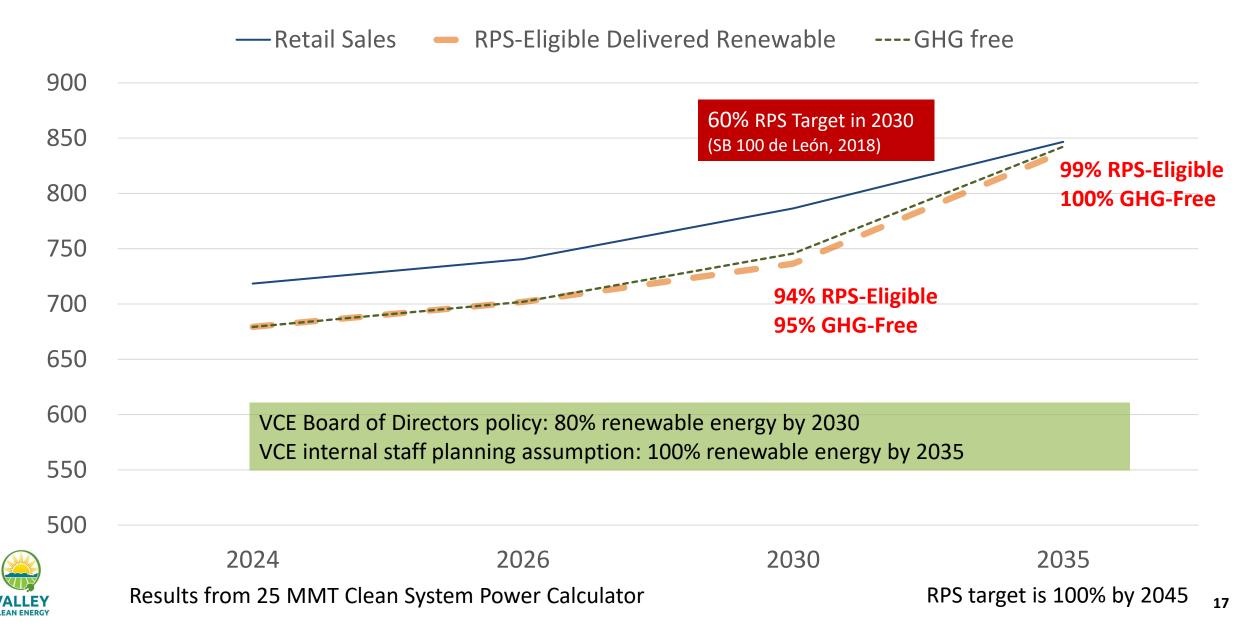
# Item 8 – IRP Update: VCE Portfolio (Cumulative MW Nameplate Capacity)

Yea	Year			2030	2035
	BTM PV	66	77	103	134
Estimated Resources	CAM Capacity <sup>1</sup>	22	22	22	30
	RA Only Resources	25	38	27	60
	Solar PV	50	50	50	50
Operational Decourses	Small Hydro	3	0	0	0
<b>Operational Resources</b>	Demand Response	7	7	7	0
	Battery (4-hr)	3	3	3	0
In Development	Hybrid Solar	185	185	185	185
In-Development	Geothermal	5	5	5	5
Contracted Resources	Battery (8-hr)	0	5	5	5
IDD I dont if od Eutomo	Battery (4-, 6-, 8-hr)	20	20	73	70
IRP-Identified Future	Onshore Wind	0	20	39	39
Resources	Offshore Wind	0	0	0	35
Cumulative To	tal Resources	320	399	491	554



1. Cost Allocation Mechanism (CAM) for legacy PG&E resources

# Item 8 – IRP Update: VCE Portfolio Results – Renewable & GHG-Free Energy, GWh



# Item 8 – IRP Update: VCE Portfolio Results – Emissions & Supply/Demand

Emissions	Unit	2030	2035
CO <sub>2</sub>	tonnes/yr	67,000	56,000
PM2.5	tonnes/yr	2.319	1.814
SO <sub>2</sub>	tonnes/yr	0.229	0.178
NOx	tonnes/yr	6.106	3.773

VCE 2030 emissions are 21.2% below 2030 target of 85,000 metric tons VCE 2035 emissions are 20% below 2035 target of 70,000 metric tons

Supply Demand Balance Summary	Unit	2030	2035
LSE Supply, before curtailment and exports	GWh	838	932
Net Purchases, before curtailment and exports	GWh	11	(18)
Curtailment	GWh	(96)	(105)
Exports	GWh	(19)	(25)
Zero Emissions Power From System	GWh	9	5
Net System Power (incurs emissions)	GWh	118	108



Results from 25 MMT Clean System Power Calculator

# Item 8 – IRP Update: Conclusion

- IRP provides forward-looking guidance for planning power portfolio needs to meet GHG, RPS, reliability, supply, and other goals
- Process & modeling incorporate many assumptions that:
  - Do not always reflect VCE's actual circumstances
  - Are limited in consideration of both changing technology and market dynamics
- Actual procurement may differ from the IRP results
  - Actual project costs
  - Technological performance and developments
  - Changes in VCE customer base or energy profile
  - Ongoing changes in regulatory approaches (e.g., reliability, resource adequacy, electrification, and future unknown changes
- VCE is on track to achieve its goals of providing 100% renewable, carbon-free electricity at competitive prices for its customers well ahead of state requirements

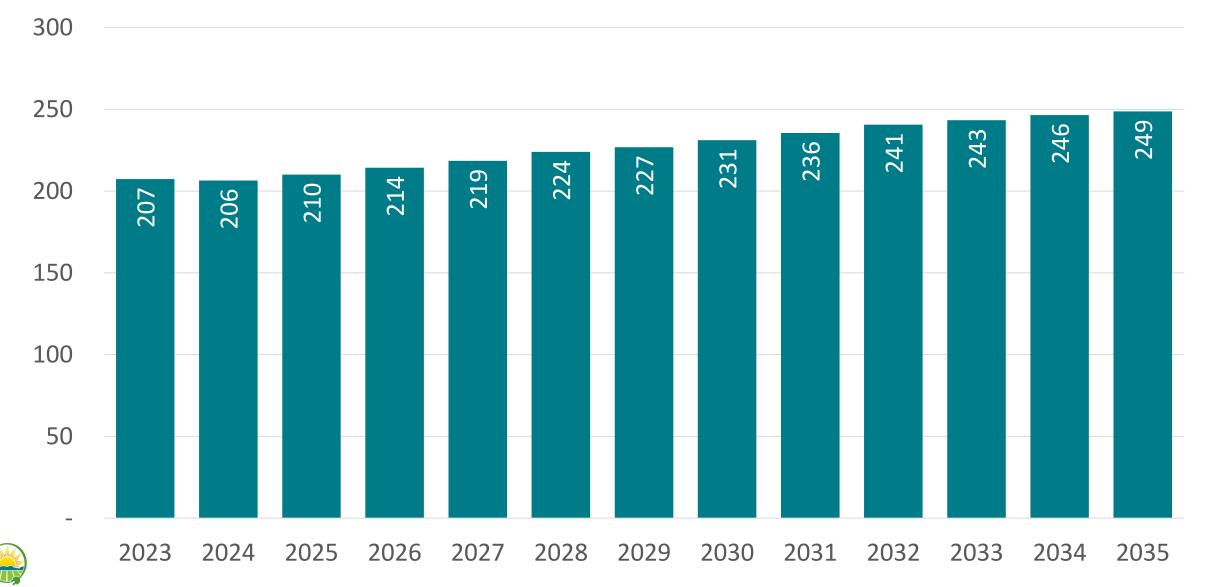


Near final draft to the Board (Oct) and Nov 1<sup>st</sup> CPUC filing deadline

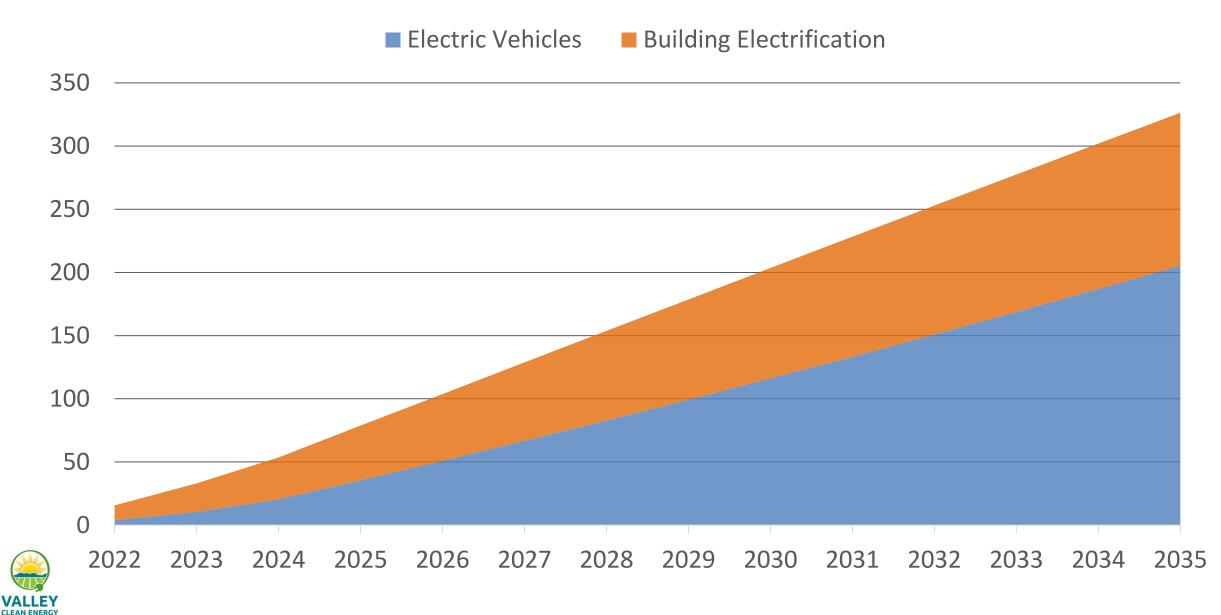
# Appendix



# Item 8 – IRP Update: VCE Annual CAISO-Coincident Peak Forecast (MW)



# Item 8 – IRP Update: VCE's Internal EVs & Building Electrification Projections (GWh)



# Item 8 – IRP Update: Reliability Modeling

- Resource Adequacy and IRP modeling use a <u>unified dataset</u>
- CPUC uses the Strategic Energy & Risk Valuation Model (SERVM) probabilistic system reliability and production cost model
- Inputs include:
  - Energy and peak demand assumptions from the CEC's 2021 IEPR demand forecast
  - Demand modifiers based on BTM PV, EVs, electrification, and other factors
  - Hourly resource generation profiles for solar and wind based on 1998-2020 weather patterns
  - Transmission capability for both WECC regions and intra-CAISO transfers



# Item 8 – IRP Update: Reliability Modeling

- Reliability Standard: systemwide statistical target for maximum loss-of-load probability (LOLP)
  - 1 day in 10 years = 0.1 day per year loss of load expectation (LOLE)
  - Total Reliability Need (TRN) is the total MW of capacity needed to achieve the LOLE
- Planning Reserve Margin (PRM): % of capacity required above peak load needed to reach the TRN



#### Total Reliability Need =

Total effective capacity (in MW) needed to maintain an adopted reliability standard (e.g. < 0.1 day/yr LOLE). Planning Reserve Margin = % margin above peak demand necessary to reach the TRN

$$PRM \% = \left(\frac{TRN}{Peak \ Demand}\right) - 1$$



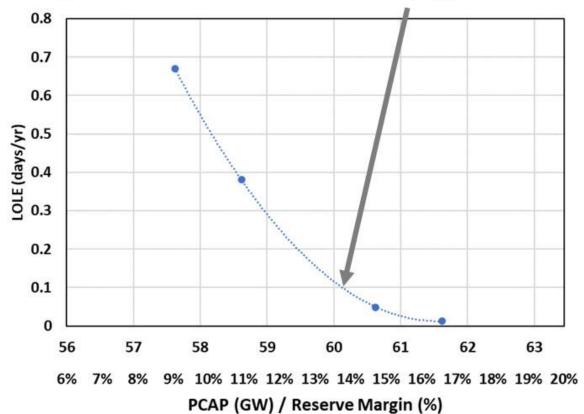
Source: <u>Reliability Filing Requirements for Load Serving Entities' 2022</u> <u>Integrated Resource Plans-Results of PRM and ELCC Studies. Energy</u> Division. July 29, 2022

# Item 8 – IRP Update: Planning Reserve Margin

- 2022 IRP Plans use the Perfect Capacity (PCAP) PRM method
  - Measures all generating resources MW capacity as their perfectcapacity equivalent based on effective load carrying capability (ELCC)
  - The ELCC of a specific resource is based on its modeled performance and effects of interaction with other resources
  - ELCC changes from year to year
- 14% PCAP PRM over gross peak meets the 0.1 LOLE

#### SERVM's CAISO PCAP PRM Simulations (2024)

LOLP simulations indicate an <u>**13.8%</u>** reserve margin needed to meet 0.1 days/year LOLE</u>





Source: <u>Reliability Filing Requirements for Load Serving Entities' 2022 Integrated</u> <u>Resource Plans-Results of PRM and ELCC Studies. Energy Division</u>. July 29, 2022

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# Item 8 – IRP Update: Applying the ELCC to Portfolio Resources

- LSEs are required to use the Marginal Effective Load Carrying Capability (ELCC) rating to determine the capacity value of a resource
- The Marginal ELCC of any individual resource is the gradient (or slope) of the modeled portfolio surface along a single dimension

• Marginal ELCC 
$$_{G_1} = \frac{\partial f}{\partial G_1}(G_1, G_2, \dots, G_n)(\%)$$

- Provides an economically efficient signal for incremental procurement
- Marginal ELCC impacts the cost per unit of effective capacity

	Gross Cost, \$/kW-yr	Marginal ELCC	Effective Cost, \$/kW-year
Storage	\$150	76%	\$197
Solar	\$80	6%	\$1,333
Wind	\$150	16%	\$938



Source: <u>Reliability Filing Requirements for Load Serving Entities' 2022 Integrated</u> <u>Resource Plans-Results of PRM and ELCC Studies. Energy Division</u>. July 29, 2022

# Item 8 – IRP Update: Marginal Need & ELCCs - 38 MMT Scenario

			and the second	Modeled Year (results complete)		Interp	Interpolated Year					
Resource Class	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
In-state Wind (SoCal)	15%	15%	15%	12%	8%	8%	8%	7%	7%	6%	5%	4%
In-state Wind (NorCal)	30%	30%	31%	24%	17%	17%	16%	15%	13%	12%	10%	9%
Out-of-state Wind (WY/ID)	43%	39%	36%	37%	39%	31%	24%	25%	26%	27%	29%	30%
Out-of-state Wind (WA/OR)	26%	24%	22%	23%	24%	19%	14%	15%	16%	17%	18%	18%
Out-of-state Wind (AZ/NM)	38%	35%	32%	34%	35%	28%	21%	22%	24%	25%	26%	27%
Offshore Wind	55%	51%	46%	49%	51%	47%	43%	40%	38%	36%	34%	32%
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Hydro (large)	57%	56%	56%	53%	50%	49%	48%	47%	46%	45%	44%	43%
Hydro (small)	41%	40%	40%	38%	36%	35%	35%	34%	33%	32%	32%	31%
Firm*	85%	86%	87%	87%	86%	85%	84%	86%	87%	88%	89%	90%

48,441

46,964

46,372

45,780

47,702

45,188

44,596

44,005

48,838

50,521

52,204

50,322

Marginal Reliability Need

VALLEY CLEAN ENERGY



# Item 8 – IRP Update: CPUC Resource Cost Data Sources

Technology	Data Source – 2021 PSP	Data Source – LSE Filing Requirements				
Solar PV (utility-scale, distributed)	NREL 2020 Annual Technology Baseline (ATB)	NREL 2021 ATB				
Land-Based (Onshore) Wind	NREL 2020 ATB	NREL 2021 ATB				
Offshore Wind	NREL OCS Study BOEM 2020-048 (+ financing from NREL 2020 ATB)	NREL OCS Study BOEM 2020-048 (+ financing from NREL 2021 ATB)				
Geothermal	NREL 2020 ATB	NREL 2021 ATB				
Small Hydro	NREL 2020 ATB	NREL 2021 ATB				
Biomass	NREL 2020 ATB	NREL 2021 ATB				
Gas (combined cycle, combustion turbine)	NREL 2020 ATB	NREL 2021 ATB				
Li-ion Battery	Lazard Levelized Cost of Storage v6.0 (LCOS 6.0) (+ cost trajectories from <u>NREL battery study</u> )	Lazard LCOS <b>7.0</b> (+ cost trajectories from <u>NREL battery study</u> )				
Flow Battery	Lazard LCOS 4.0	No update (not available in later LCOS)				
Pumped Hydro Storage	Lazard LCOS 2.0	No update (not available in later LCOS)				

Note: NREL typically publishes new Annual Technology Baseline (ATB) data around June each year. Lazard typically publishes new Levelized Cost of Storage (LCOS) analysis around November each year.

California Public Utilities Commission





VCE Community Advisory Committee Meeting – September 22, 2022 via video/teleconference

Item 9 – Rate Adjustment System – Introduction



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# **Overview**

VCE and all other Load Serving Entities (i.e. CCA's, Publicly Owned Utilities, and Investor Owned Utilities), face volatility in key external cost factors that are largely outside their control. A Rate Adjustment System "RAS" could automatically adjust customer rates within a Board defined range to more timely and accurately reflect changes in key external cost factors outside VCE's control.

#### This informational presentation will provide:

- Background & Introduction of Rate Adjustment System Concept
- Summary and proposed next steps
- Discussion & Feedback



# **Background**

Summary of VCE key Customer Rate actions 2020-2022.

- 2017 VCE Implementation Plan: Program rates must collect sufficient revenue from participating customers to fully fund VCE's budget, including the need to establish sufficient operating reserve funds.
- 2020 Strategic Plan: Maintain financial stability while continuing to offer customer choice, competitive pricing and establishment of local programs.
- 2018 2021 VCE has systematically analyzed policy options and implemented strategies to stabilize customer rates, reduce cost, and manage reserves.

o e.g.: Discontinue rate discount; scaled back REC purchases; sign long-term renewable PPA's

- November 2021- VCE Board adopted cost-based rate policy and deferred consideration of an expanded customer rate structure
- July 2022 VCE Board adopted a new three-tiered customer rate structure starting 2023.

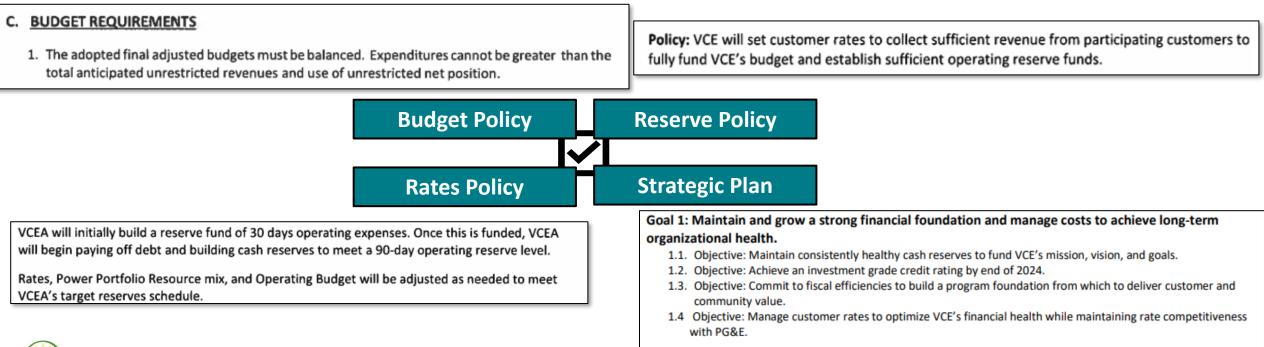


#### What is a Rate Adjustment System (RAS)?

A tool utilized to make automatic adjustments within predetermined guidelines triggered by movement in recovery of specific costs.

### Why use a RAS?

#### Aligns with VCE Policies & Strategies





### Who uses Rate Adjustment Systems (RAS)?

Rate Adjustment systems are near universal throughout U.S. public and investor owned utilities

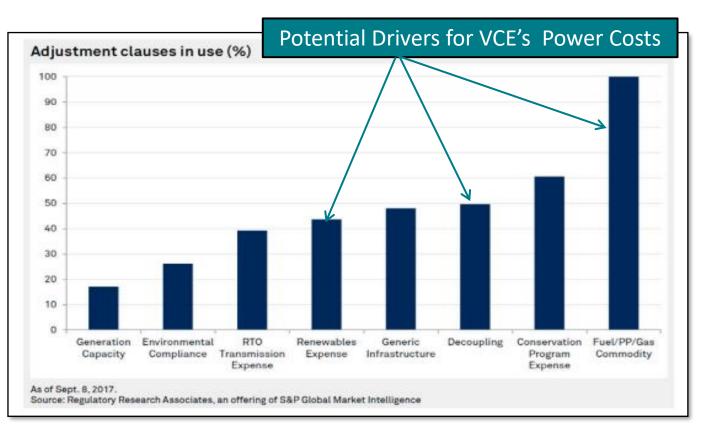
# What is typically utilized in a Rate Adjustment System (RAS)?

#### Wholesale Power Supply

- Capacity, Energy, Renewables, RA, CAISO, etc.
- + / Market fluctuations
- ~ 90% of Operating Cost
- Hedging only partial control

### PG&E / CPUC and PCIA Changes

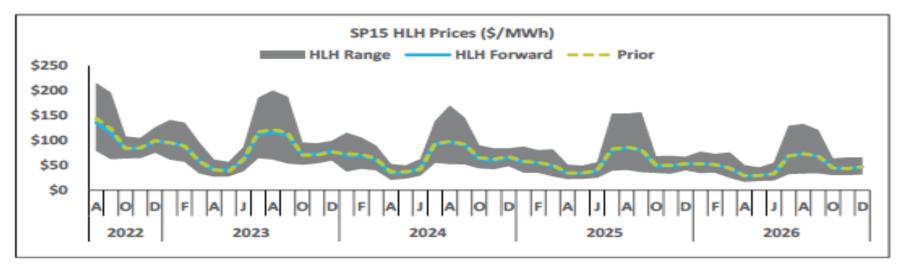
- Unique to CCAs
- Vary without notice
- Direct CCA revenues impact
- Not under VCE control

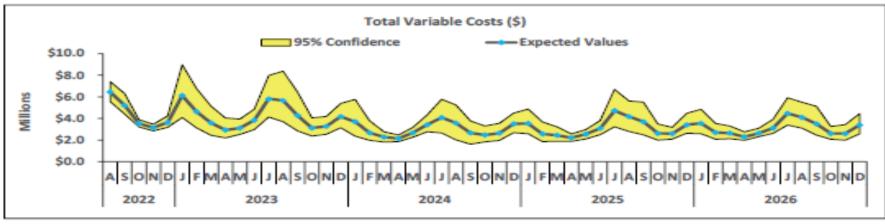




# **Energy Cost Volatility**

#### VCE budgets for "expected" outcome but market can vary significantly







### **Rate Adjustment System Key Attributes**

- Allow +/- adjustments
- Timely response to power cost and load uncertainties
  - Power Market Volatility Commodity Prices
  - Weather Heat Waves and Droughts
  - Regulatory Proceedings PCIA and RA
- Board Authorized Range such as "+- XX%"

# **Rate Adjustment System Benefits**

- Design to insulate customers from rate shocks
  - Inclusive of CARE/FERA
- Positive view by rating agencies
- Avoid multiple annual rate reviews
- Moderate pressure on cash reserves & debt covenants
  - Formal Review (EROC) and Reporting (BOARD)

### **Proposed Schedule**

- September Review and receive CAC input on Concept (Current)
  - Develop Draft Schedule and Examples
- October 2022 Review draft Rate Adjustment System with CAC
  - Receive additional feedback for Draft Customer Rate Adjustment System
  - Examples based on three product categories (Base, Standard, and Ultra Green)
  - Address potential CARE/FERA protections
- November 2022 Return to Board and CAC for proposed Rate Adjustment System
  - Present Draft Customer Rate Adjustment System to Board
  - Present Draft Proposed Customer Rate Adjustment System to CAC for recommendation
- December 2022 Rate Adjustment System for 2023
  - Present Draft Proposed Customer Rate Adjustment System for possible board adoption (2023 Implementation)
  - Consolidate with 2023 Budget & Rates Adoption



### **Summary & Discussion**

Staff is seeking initial CAC feedback to incorporate into a VCE Rate Adjustment System to return later this Fall for further Board consideration.

#### Next Update in October will include:

- Preliminary Draft Customer Rate Adjustment System
- Examples based on three product categories (Base, Standard, and Ultra Green)
- Address potential CARE/FERA protections





VCE Community Advisory Committee Meeting - September 22, 2022 via video/teleconference Item 10 – Receive progress update on VCE 3-Year Programs Plan and 2023 program concepts



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#### This informational presentation will provide:

• Update on progress made on evaluating and launching programs

#### **Background**

- 3-Year Programs Plan (3YPP) was approved by the Board in June 2021
- PTG and CAC provided a lot of feedback on program concepts and evaluation methodology
- Evaluation methodology criteria include
  - Greenhouse gas (GHG) mitigation
  - Ease of implementation
  - Customer satisfaction
- Staff and the Programs Task Group (PTG) also evaluate other CCA programs



# **Update**

• Since Board approval in June 2021, VCE has launched 4 new programs and continued 3 programs, for a total of 7 active programs

### **New Programs:**

#### **Heat Pump Program**

- Launched in June 2022; Staff held first contractor-focused webinar
- Webinar focused on:
  - Getting customers access to rebates and incentives for heat pump water heaters
  - Demystifying heat pumps
  - Dispelling misinformation.
- Well-attended; video is live on VCE's website
- Staff will evaluate Phase 2 of Heat Pump Program in Q2 2023



# **Agricultural Flexible Irrigation Technology (AgFIT)**

- Launched in July 2022 with 8 pumps; enrolling remaining pumps
- Preliminary data indicates possible modest savings for customers
- 1.8MW (out of 5MW cap) are enrolled
- Recruitment underway for 2023 growing season

### **OhmConnect**

- Continued 2nd year of outreach/marketing partnership
- Customers shift usage for "OhmHour" events of peak stress on the grid
- 2022 Spring Campaign yielded 132 utility connected accounts
- Higher Summer Campaign incentives: \$50 sign-up bonus, ongoing cash and rewards
- Overall very low unsubscribe rates



### **Electric Vehicle (EV) Rebate Program**

- Launched September 19, 2022
- Higher incentives for low-income customers: \$4,000 for battery electric (BEV) or plug-in hybrid vehicles. Standard applicants: \$2,500 for BEV; \$2,000 plug-in hybrids
- Wide promotion: social media, print ads, digital ads, posters, new collateral and new swag. Staff is working with community partners to spread the word.

### **Continuing Programs:**

# **Electrify Yolo (SACOG Grant) for EV Chargers**

- Program active; all jurisdictions making progress toward installing chargers
- Despite delays, project is projected to reach completion on time (December 2023).



### **Continuing Programs:**

# **Energy Efficiency Graphic**

- Educational program active
- Graphic updated and translated into Spanish (Summer 2022)

# **Electric Vehicle Information**

- Informational program active in English and Spanish; regularly updated
- Customers can compare EV models, estimate savings, learn about EV benefits and carbon reduction, find EV chargers and evaluate rebates and incentives



### **2023 Program Concepts Under Consideration**

Staff will return to CAC Q1 2023 for feedback on concepts before concepts go to Board for consideration

- Continuing OhmConnect partnership
- Phase 2 of the EV Rebate Program
  - Potentially including used vehicles for rebates
- Phase 2 of the Heat Pump Program
  - Potentially including rebates for heat pump installations
- Energy efficiency rebates for low-income customers
- Home energy ratings
- Agricultural electrification
- Self-Generation Incentive Program (SGIP)
- Workforce Development

