VCE Community Advisory Committee Meeting – December 16, 2021 via video/teleconference

Item 7 – 2022 Legislative Platform

Public Comments

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- E-mail 300 words or less to: meetings@valleycleanenergy.org

OR

Join the Public Comment Queue by

- "Raising Hand" on Zoom Meeting

OR

- Press *9 if joining by phone

Emailed comments received **before** the item has concluded will be read into the record.

Emailed comments received **after** the item has concluded but before the end of the meeting will not be read but will be included in the meeting record.

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Item 7 – 2022 Legislative Platform

Background:

- The original 2020 Legislative Platform was prepared at request of Board Chair Don Saylor and was adopted at the July 8, 2020 board meeting.
- The Legislative Platform is to be updated annually and in advance of the new legislative session.
- VCE's Vision Statement and positions taken on past and current legislation serve as the basis for the proposed actions and positions outlined in the Legislative Platform.
- The Legislative Platform will serve as a guide for VCE's lobbyist, Pacific Policy Group, to evaluate bills and positions to recommend to VCE staff and the Board.

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Item 7 – 2022 Legislative Platform

No Edits Made to the Platform

- The 2021 Legislative Platform covered a broad suite of issues that remain relevant heading into 2022.
- 2022 is the second year of the two-year session and there are two-year bills that speak to provisions in the platform:
  - SB 612 (Portantino) – addresses Provision 4 re: PCIA
  - SB 99 (Dodd) – addresses Provision 7 re: Community Resilience
- Several provisions were addressed in 2021 but remain relevant
  - AB 843 (Aguiar-Curry) – addressed provision 8 re: renewable energy generation sources
  - AB 135 (Ting) & SB 170 (Budget) - addressed provision 6 re: COVID-19 response

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VCE Community Advisory Committee Meeting – December 16, 2021
via video/teleconference
Item 8 – Preliminary Results of Zero-Carbon Portfolio Study from Carbon Neutral Task Group

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Item 8 – Preliminary Results of Zero-Carbon Portfolio Study: Background

- VCE's strategic plan Goal 2: Manage power supply resources to consistently exceed California's Renewable Portfolio Standard (RPS) while working toward a resource portfolio that is 100% carbon neutral by 2030.
  - Objective 2.5: Study and present options for achieving a 100% carbon neutral resource portfolio as well as 100% carbon free resource portfolio (carbon free hour by hour) by 2030.[1]

- CAC Programs Task Group has been formed to assist with this effort.[2]

- Request for proposals (RFP) was issued in April '21 for consulting services to perform the study.[3]

1) Carbon neutral electricity is net zero carbon electricity that may include the use of carbon credits and/or higher production of carbon free electricity that averages out to provide a carbon free portfolio over a period of time whereas carbon free hour-by-hour means all electricity consumed by VCE customers will be from carbon free and/or renewable resources.
2) Task Group meets bi-weekly, provided input to the RFP, and provided update to CAC in August.
3) RFP resulted in a contract w/ Energeia that was approved by the Board in July '21.

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Item 8 – Preliminary Results of Zero-Carbon Portfolio Study: Timeline

Q1 2021

- Board approves Strategic Plan (10/8/2020)
- Task Group formed (1/28/21)
- Identify consultants
- Begin defining SOW

Q2 2021

- Compile inputs/ assumptions
- Identify eligible technologies
- Finalize consultant selection
- Board approval, if necessary
- Metrics to consider

Q3 2021

- Kickoff analysis
- Analyze findings & prepare initial plans
- CAC & Board engagement

Q4 2021

- Finalize plans
- Develop final report
- CAC (12/2021) & Board Engagement (1/2022)

NOTE: The next IRP will be due no sooner than May 1, 2022, but appears likely to be extended. The CPUC is considering a staff proposal to streamline IRP/RPS filings, which could move the next full IRP filing to 2023 (with new IRPs filed every three years thereafter).

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Zero-Carbon Portfolio Construction

Valley Clean Energy Alliance

7 December 2021

Confidential

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Table of Contents

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Background

Deliverables

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Project Deliverables

- Portfolio Study Report per the matrix to the right in 2030 including:
  - Potential renewable resources and associated capacities and costs
  - Risk analysis
  - Discussion of possible future industry trends in renewable resources

Specified Analytical Framework

POWER SOURCE	HOUR BY HOUR	CARBON NEUTRAL
RENEWABLE	R/HBH	R/CN
CARBON-FREE	CF HBH	CF/CN

ANAYLYSIS TIME FRAME

Source: VCE (2021), *RFP NO. 2021CFPS*

Portfolio definitions include:

- **Hour by Hour:** Renewable or Carbon Free electricity is used to meet demand every hour of the day
- **Carbon Neutral:** VCE's carbon-emitting energy usage is offset by VCE's annual renewable generation
- **Renewable Electricity:** Includes biomass, digester gas, landfill gas and municipal solid waste conversion,* solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, ocean wave, ocean thermal, or tidal current and is assumed to be free of GHG emissions
- **Carbon Free Electricity:** Identical to Renewable Electricity and includes large hydroelectric generation

*Biomass, digester gas and municipal solid waste would be used for combustion

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Optimized Portfolios

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Capacities of Potential Resources by Portfolio

Proposed Portfolios (MW)

Scenarios	Power Source	Solar	Wind	Geothermal	Small Hydro	Large Hydro	4-Hour BES	8-Hour BES	12-Hour PES	OCGT
HBH	Carbon Free	0.0	39.3	11.3	0.0	0.0	42.3	65.4	10.7	112.3
HBH	Renewable	0.0	39.3	11.3	0.0	0.0	42.3	65.4	10.7	112.3
CN	Carbon Free	0.0	26.1	0.0	0.0	0.0	100.0	7.7	0.0	0.0
CN	Renewable	0.0	26.1	0.0	0.0	0.0	100.0	7.7	0.0	0.0

Source: Energeia research and analysis

- Resource modelling found wind and geothermal to be the lowest cost resources for meeting all scenarios in 2030
- A green hydrogen fueled Open Cycle Gas Turbine is used in the hour-by-hour scenario to ensure load is met every hour*
- There is no difference between the portfolios using Carbon Free vs. Renewable electricity as hydropower is never the cheapest options with the prices being used

*RNG was also considered as a fuel, but green hydrogen was used in the analysis because it is projected to be the most economical fuel option after 2030.

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Annual Portfolio Costs

Annual Resource Costs ($M/Yr)

Scenarios	Power Source	Solar	Wind	Geo-thermal	Small Hydro	Large Hydro	4-Hour BES	8-Hour BES	12-Hour PES	OCGT	Total ($M/Yr)
HBH	Carbon Free	$0.0	$3.3	$7.3	$0.0	$0.0	$5.3	$14.4	$3.3	$12.9	$46.5
HBH	Renewable	$0.0	$3.3	$7.3	$0.0	$0.0	$5.3	$14.4	$3.3	$12.9	$46.5
CN	Carbon Free	$0.0	$2.2	$0.0	$0.0	$0.0	$12.7	$1.7	$0.0	$0.0	$16.5
CN	Renewable	$0.0	$2.2	$0.0	$0.0	$0.0	$12.7	$1.7	$0.0	$0.0	$16.5

Source: Energeia research and analysis
Notes: HBH = Hour-by-Hour; CN = Carbon Neutral; Hydro = Hydropower; BES = Battery Energy Storage; PES = Pumped Energy Storage; OCGT = Open Cycle Gas Turbine

Annual Total Portfolio Costs ($M/Yr)

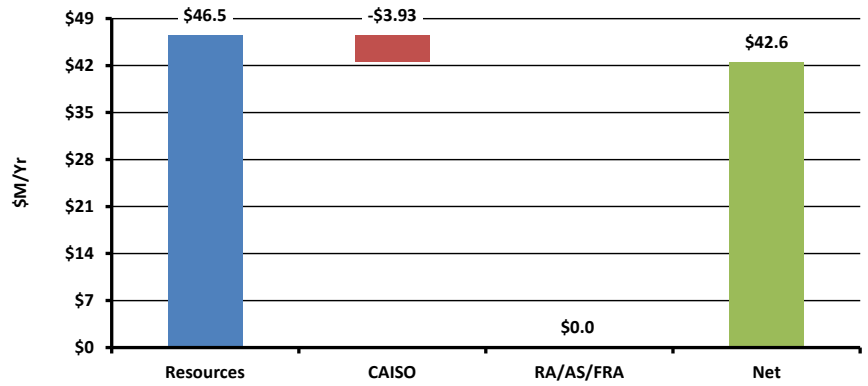
Scenarios	Power Source	Resources	RA/AS/ FRA	CAISO	Net
HBH	Carbon Free	$46.5	$0.0	($3.9)	$42.6
HBH	Renewable	$46.5	$0.0	($3.9)	$42.6
CN	Carbon Free	$16.5	$0.0	$0.5	$17.0
CN	Renewable	$16.5	$0.0	$0.5	$17.0

Source: Energeia research and analysis
Notes: HBH = Hour-by-Hour; CN = Carbon Neutral; RA = Resource Adequacy; AS = Ancillary Services; FRA = Flexible Resource Adequacy; CAISO = CA Independent System Operator

- The incremental resource portfolio to meet hourly demand with zero carbon generation is approximately three times more costly at $46.5m compared to $16.5m for a carbon neutral portfolio
  - These costs are in addition to VCE's current annual resource costs of $50m to $60m
- Oversized resources in the HBH scenario allow for more CAISO revenue

Annual Portfolio Costs – CASIO, RA, etc.

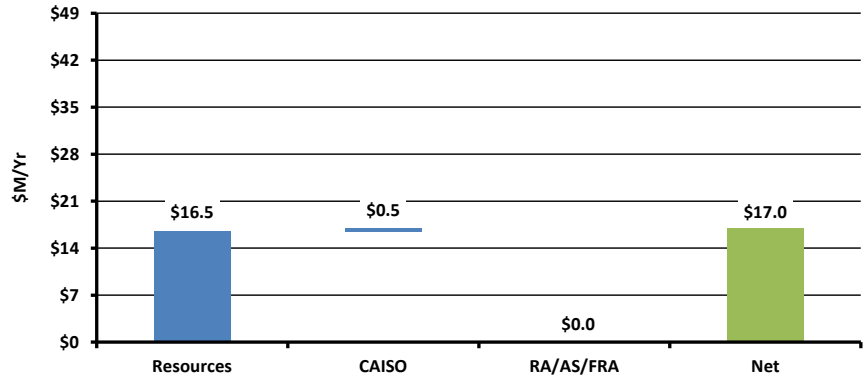
Hour-by-Hour Balancing



Source: Energeia research and analysis
Note: RA = Resource Adequacy; AS = Ancillary Services; RFA = Flexible Resource Adequacy

- HBH portfolio supplies all needed Resource Adequacy (RA), Flexible RA and ancillary services requirements
- Exports to CAISO generate significant source of revenue reducing costs by nearly 10%

Carbon Neutral Balancing



Source: Energeia research and analysis
Note: RA = Resource Adequacy; AS = Ancillary Services; RFA = Flexible Resource Adequacy

- CN portfolio supplies all needed Resource Adequacy (RA), Flexible RA and ancillary services requirements
- CAISO grid purchases and sales almost perfectly offset

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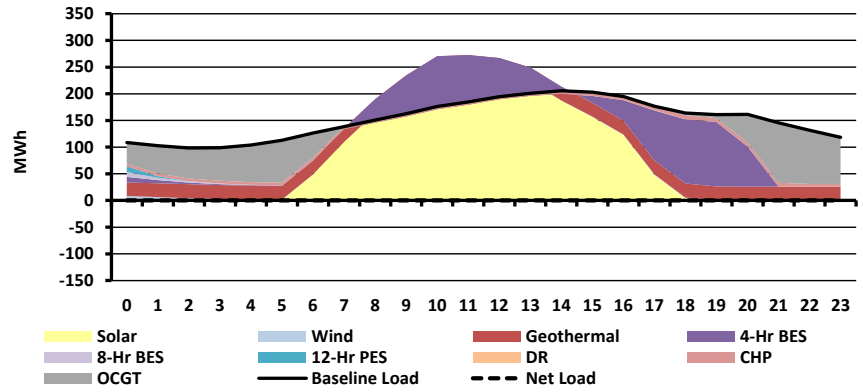
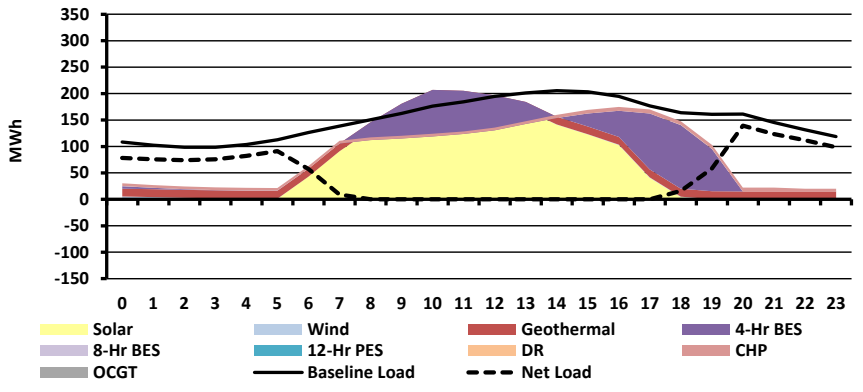
Peak and Minimum Days

Hour-by-Hour – 2030 Peak Day



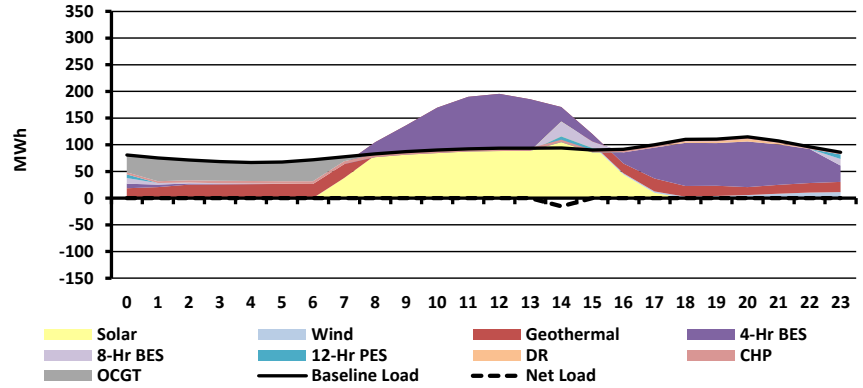
Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Carbon Neutral – 2030 Peak Day



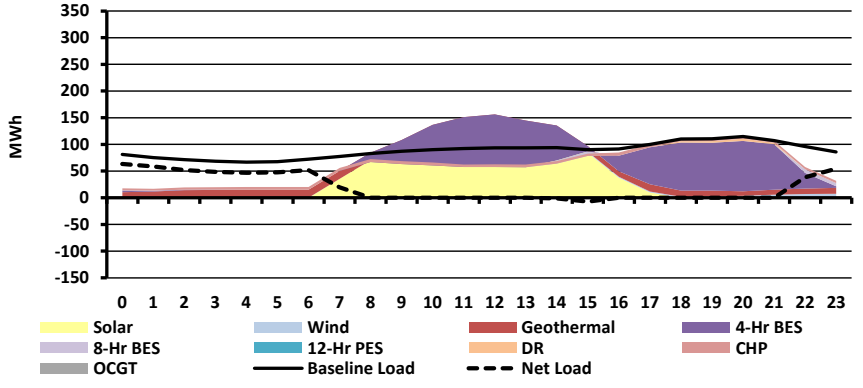
Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Hour-by-Hour – 2030 Minimum Day



Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Carbon Neutral – 2030 Minimum Day



Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Risk Report

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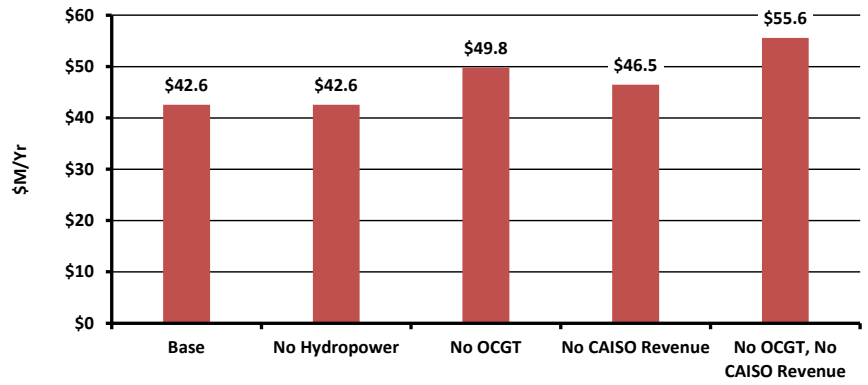
Key Risk Analysis

- Key risks were discussed with the working group, and a set of key risks agreed, which were then assessed against the optimized portfolios by scenarios
  - Risk of low rainfall
    - Impact on hydro resources not needed as no hydro resources included in optimal portfolio
    - Impact on pumping loads being tested using VCE data on pumping loads
  - Risk of resource availability for contracting
    - Limited availability of geothermal, wind, etc. resources tested against California SB350 assumptions
    - Green hydrogen-based combustion is an immature technology. Portfolio construction without green hydrogen-based combustion was evaluated.*
  - Risk of CAISO prices being lower and even negative
    - We have tested with 0 CAISO benefits
  - Risk (positive) of using programs to develop flexible loads that complement resource profile
    - Impact of an EV load management program being tested
    - Impact of a building electrification load management program being tested

*The hour-by-hour portfolio without green hydrogen-based combustion is $49.8m, which is $7.2m dollar more than the base hour-by-hour portfolio

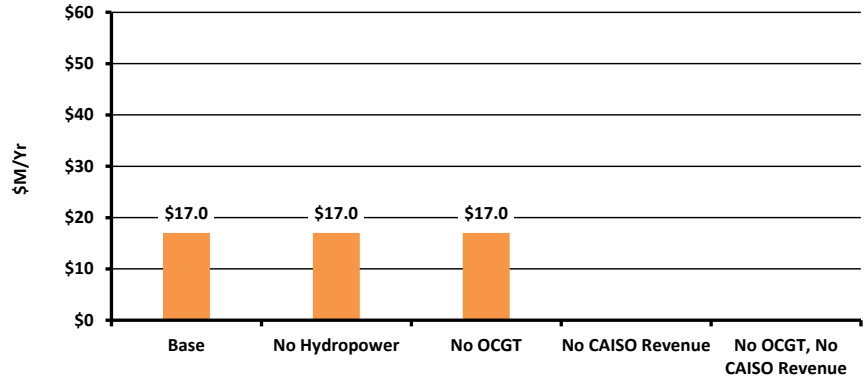
Annual Costs by Portfolio – Key Risk Factor Impacts

Hour-by-Hour Balancing



Source: Energeia research and analysis

Carbon Neutral Balancing



Source: Energeia research and analysis

- Added constraints* generate more expensive portfolios
- The most expensive portfolio contains the most constraints:
  - No OCGT increases costs by $7.2M p.a.
  - No CAISO sales increases costs by $3.9M
- Risk factors do not impact costs under this scenario as the Carbon Neutral scenario does not incorporate hydropower or OCGT
  - CAISO sales assumed as a core part of the scenario

*A constraint is defined as a removed variable, so more constraints corresponds to more portfolio variables removed in the optimization

Looking Forward

Pathways to Portfolio

Next Steps

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Pathways

- Resources present in both portfolios should be purchased first. These resources include wind, 4-Hr BES and 8-Hr BES.*
- The costs of battery storage systems are expected to decline significantly over the next decade (Appendix A), while the costs of wind resources are projected to remain relatively stagnant, suggesting the optimal strategy is delaying purchases of BES.**
- Regarding resource placement, co-locating batteries at solar or wind*** sites, if possible, may minimize revenue lost to curtailment

*BES = Battery Energy Storage
**Battery costs incorporate potential battery loss and degradation over battery 10-year lifetime. Decommissioning costs are not included.
***Only onshore wind has been considered in this analysis

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Next Steps

- Test key risk factors
  - Drought
  - Electric vehicle program assumed
  - Building electrification program assumed
- Develop report during start of 2022

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Thank You

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Appendix

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Project Management

Project Plan and Status

Scope and Approach

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Project Scope, Schedule and Status

Project Schedule and Status

Task / Sub-Task	Month: Jul	Aug	Sep	Oct	Nov	Dec
Project Management						
Kick-off						
Progress Updates						
Weekly Project Controls						
Future Industry Trends						
Research Future Energy Trends						
Validate with VCE						
Load Profile Estimation						
Review Load and BTM Resource Data						
Prepare 8,760 and Statistical Inputs						
Resource Cost Estimation						
Update Resource Cost Estimates						
Validate with VCE						
Resource Portfolio Optimisation						
Configure Production Cost Model						
Minimize Scenario Costs						
Validate with VCE						
Sensitivity and Key Risk Analysis						
Identify Key Risks and Sensitivities						
Develop Risk Mitigations						
Validate with VCE						
Documentation						
Draft Portfolio Study Report						
Revise Portfolio Study Report						

= Complete = In-progress = Not started

- Data request fulfilment almost complete
  - Forecast hourly CAISO prices
  - Solar data useful for sensitivity analysis
- Future Industry Trends research is completed
- Load profile construction completed
- Resource cost estimate research done
- Least cost optimisation model populated
- Least cost optimisation completed
- Sensitivities underway

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Project Scope and Approach

1 Information Discovery

- Data Request
- Industry Trends research

2 Estimate Future 8760 Net Load

- IRP 8760 forecast
- Existing and planned 8760 resourcing
- Behind-the-Meter (BTM) review
- Agree key risks and sensitivities
- Validate with VCEA

3 Estimate Future Resource Costs

- Capital and operating costs by technology
- Fuel and carbon mitigation costs
- Agree key risks and sensitivities
- Validate with VCEA

4 Optimise Zero Carbon and Renewable Portfolios

- Identify least cost 8760 100% renewables and zero carbon portfolios
- Identify least cost annual 100% renewables and zero carbon portfolios
- Consider market interactions
- Agree key risks and sensitivities
- Validate with VCEA

5 Asses Key Risks and Document

- Develop Risk Report
- Develop Final Portfolio Study Report
- Develop data pack

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Future Industry Trends

Technology Cost Forecasts

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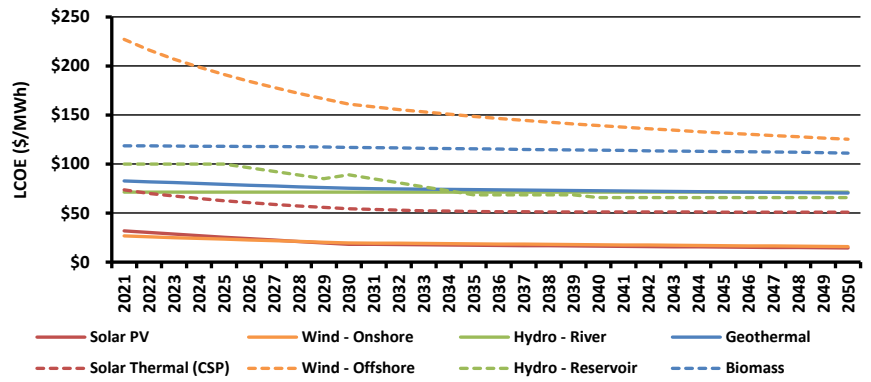
Levelized Cost of Future Clean Resources

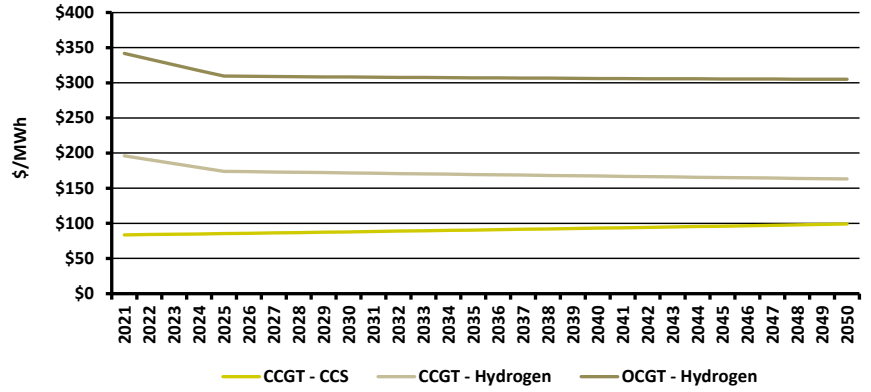
RE Technology Costs



Source: NREL (2021), *Annual Technology Baseline*
Note: CSP = Concentrated Solar Power

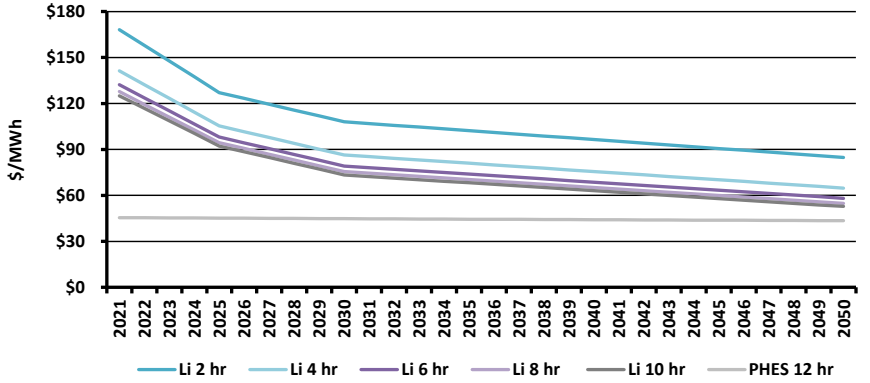
- Wide scan of potential future utility scale resources completed (see Appendix A)
- Overall, major utility scale costs expected to remaining relatively flat to 2050
  - Offshore wind, battery storage and hydrogen costs expected to fall in next 10 years

Thermal Technology Costs (incl. Fuel)



Source: NREL (2021), *Annual Technology Baseline*
Notes: CCGT = Combined Cycle Gas Turbine, OCGT = Open Cycle Gas Turbine,
CCS = Carbon Capture Sequestration; Capacity factors of 90% used for CCGT and 20% used for OCGT

Storage Costs (excl. energy)



Source: NREL (2021), *Annual Technology Baseline*
Notes: Li = Lithium, PHES = Pumped Hydro Energy Storage

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Fuel Costs

RNG vs Green Hydrogen

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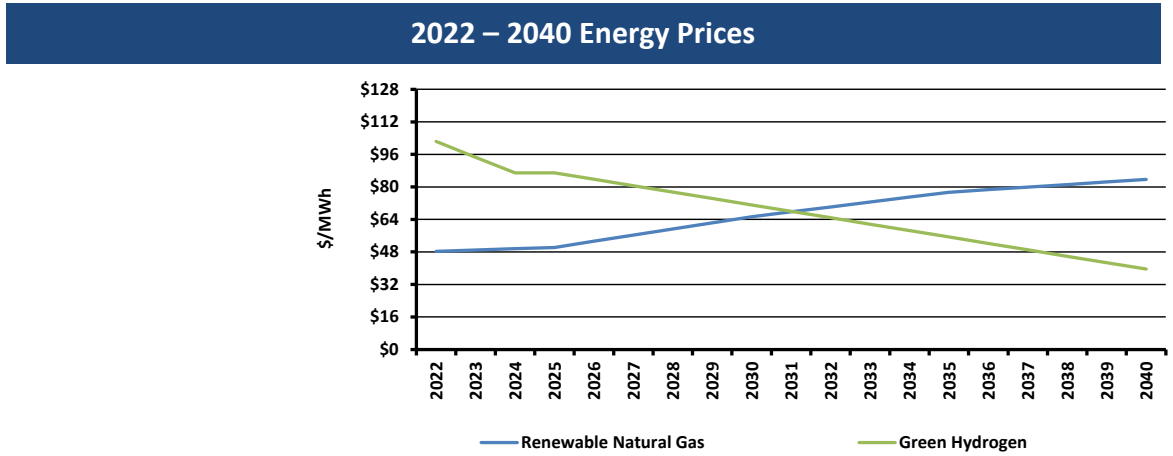
Green Hydrogen vs. Renewable Natural Gas Forecasted Pricing



Source: American Gas Foundation (2019), Energeia research and analysis

- The price of green hydrogen is forecasted to be lower than renewable natural gas after 2030, suggesting fuel costs will be lower for turbines compatible with hydrogen

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Portfolio Optimisation

Detailed Results

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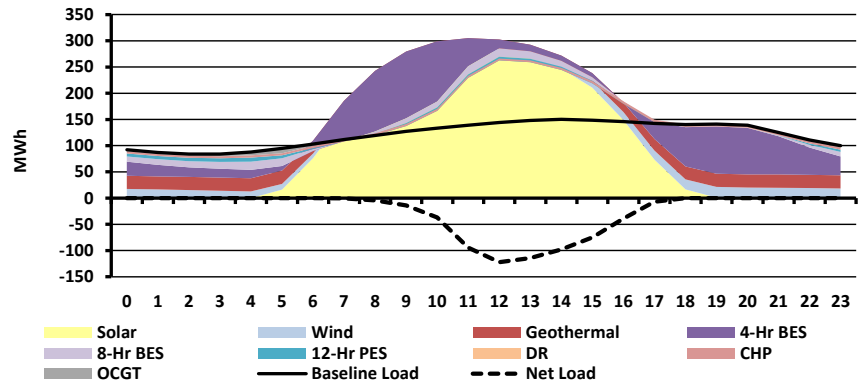
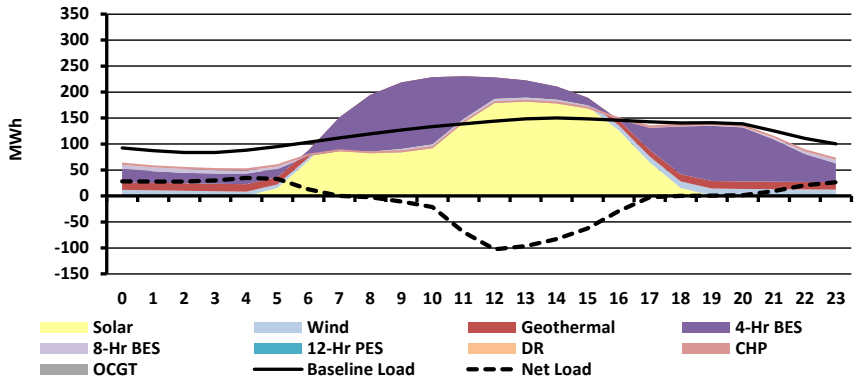
Average Summer and Winter * Days

Hour-by-Hour – 2030 Average Summer Day



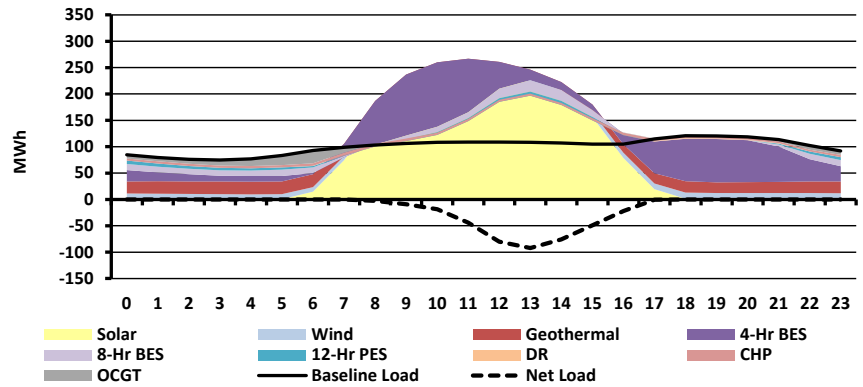
Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Carbon Neutral – 2030 Average Summer Day



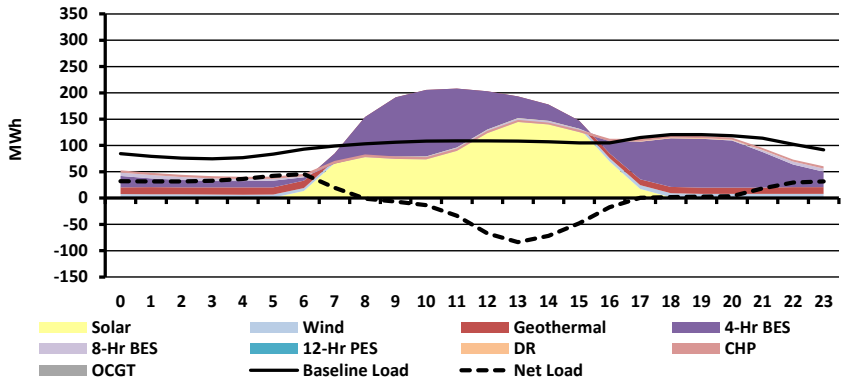
Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Hour-by-Hour – 2030 Average Winter Day



Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Carbon Neutral – 2030 Average Winter Day

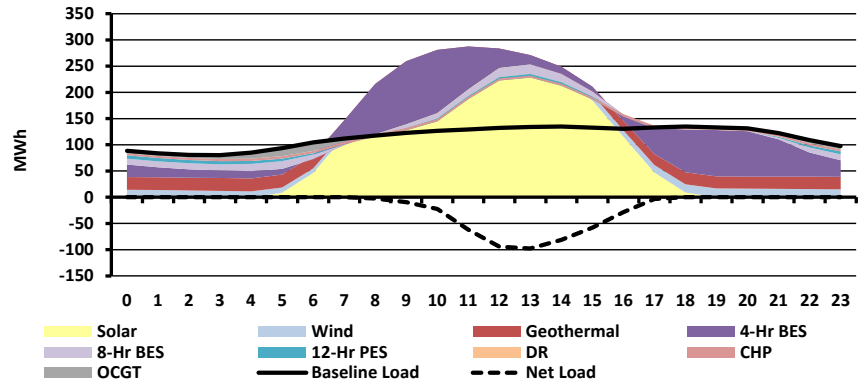


Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

*Seasons are based on PG&E's electricity rates. Summer includes May to Oct, and Winter includes all other months.

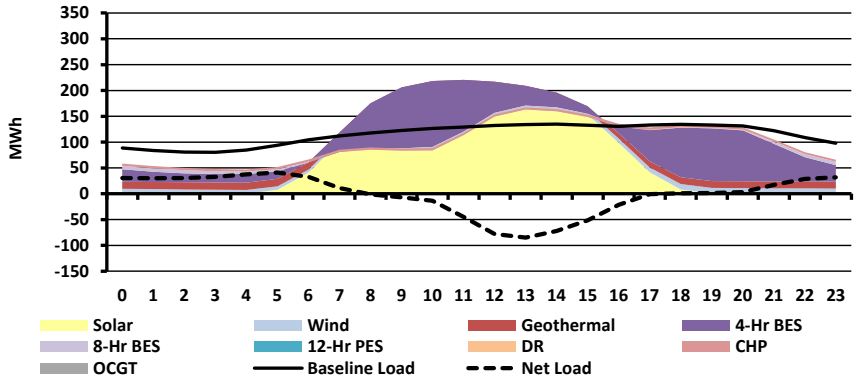
Average Hourly Weekday and Weekend Days

Hour-by-Hour – 2030 Average Weekday



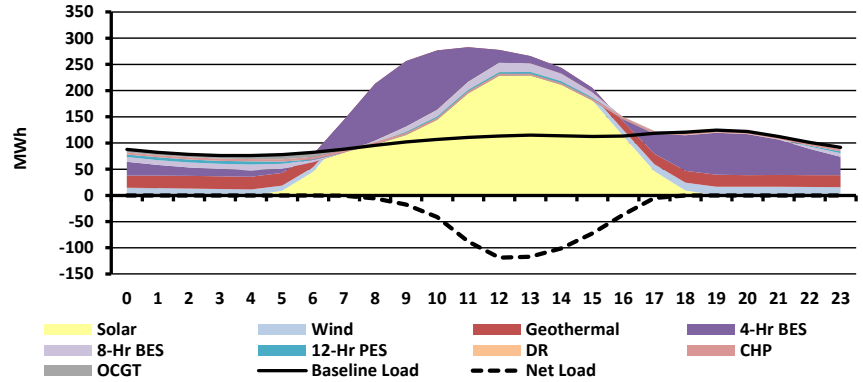
Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Carbon Neutral – 2030 Average Weekday



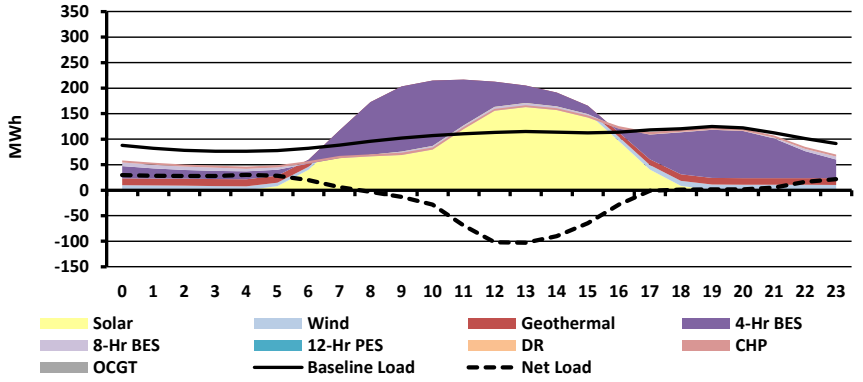
Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Hour-by-Hour – 2030 Average Weekend



Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Carbon Neutral – 2030 Average Weekend



Source: Energeia research & analysis
Notes: BES = Battery Energy Storage; PES = Pumped Energy Storage; DR = Demand Response; CHP = Combined Heat and Power; OCGT = Open Cycle Gas Turbine

Scenario Configurations

All Scenarios

#	Scenario	Electricity Type	Summary	Large Hydro	Small Hydro	OCGT	CAISO Revenue
1	HBH	Carbon Free		✓	✓	✓	✓
2	HBH	Renewable		×	✓	✓	✓
3	HBH	Carbon Free	No Hydro	×	×	✓	✓
4	HBH	Renewable	No Hydro	×	×	✓	✓
5	HBH	Carbon Free	No OCGT w/Green Hydrogen or RNG	✓	✓	×	✓
6	HBH	Renewable	No OCGT w/Green Hydrogen or RNG	×	✓	×	✓
7	HBH	Carbon Free	No CAISO Revenue	✓	✓	✓	×
8	HBH	Renewable	No CAISO Revenue	×	✓	✓	×
9	HBH	Carbon Free	No OCGT, No CAISO Revenue	✓	✓	×	×
10	HBH	Renewable	No OCGT, No CAISO Revenue	×	✓	×	×
11	HBH	Carbon Free	No Hydro, No OCGT	×	×	×	✓
12	HBH	Renewable	No Hydro, No OCGT	×	×	×	✓
13	HBH	Carbon Free	No Hydro, No OCGT, No CAISO Revenue	×	×	×	×
14	HBH	Renewable	No Hydro, No OCGT, No CAISO Revenue	×	×	×	×
15	CN	Carbon Free		✓	✓	✓	✓
16	CN	Renewable		×	✓	✓	✓
17	CN	Carbon Free	No Hydro	×	×	✓	✓
18	CN	Renewable	No Hydro	×	×	✓	✓
19	CN	Carbon Free	No OCGT w/Green Hydrogen or RNG	✓	✓	×	✓
20	CN	Renewable	No OCGT w/Green Hydrogen or RNG	×	✓	×	✓
21	CN	Carbon Free	No CAISO Revenue	✓	✓	✓	×
22	CN	Renewable	No CAISO Revenue	×	✓	✓	×
23	CN	Carbon Free	No OCGT, No CAISO Revenue	✓	✓	×	×
24	CN	Renewable	No OCGT, No CAISO Revenue	×	✓	×	×
25	CN	Carbon Free	No Hydro, No OCGT	×	×	×	✓
26	CN	Renewable	No Hydro, No OCGT	×	×	×	✓
27	CN	Carbon Free	No Hydro, No OCGT, No CAISO Revenue	×	×	×	×
28	CN	Renewable	No Hydro, No OCGT, No CAISO Revenue	×	×	×	×

Grey = Not Valid

- Configuration of wide scope of scenarios
- Scenarios 1, 2, 15 and 16 will be used to conduct sensitivity analyses

Source: Energeia research and analysis
Notes: HBH = Hour-by-hour, CN = Carbon Neutral

ENERGEIA

Detailed Scenario Results (1/3)

Name Plate Capacity (MW)

#	Scenario	Electricity Type	Scenario Summary	Solar	Wind	Geother-mal	Small Hydro	Large Hydro	4-Hour BES	8-Hour BES	12-Hour PES	OCGT
1	HBH	Carbon Free		0.0	39.3	11.3	0.0	0.0	42.3	65.4	10.6	112.3
2	HBH	Renewable		0.0	39.3	11.3	0.0	0.0	42.3	65.4	10.6	112.3
3	HBH	Carbon Free	No Hydro									
4	HBH	Renewable	No Hydro	0.0	39.3	11.3	0.0	0.0	42.3	65.4	10.6	112.3
5	HBH	Carbon Free	No OCGT	0.0	28.4	29.1	0.0	0.0	83.5	74.3	24.2	0.0
6	HBH	Renewable	No OCGT	0.0	28.4	29.1	0.0	0.0	83.5	74.3	24.2	0.0
7	HBH	Carbon Free	No CAISO Revenue	0.0	39.3	11.3	0.0	0.0	42.3	65.4	10.6	112.3
8	HBH	Renewable	No CAISO Revenue	0.0	39.3	11.3	0.0	0.0	42.3	65.4	10.6	112.3
9	HBH	Carbon Free	No OCGT, No CAISO Revenue	0.0	28.4	29.1	0.0	0.0	83.5	74.3	24.2	0.0
10	HBH	Renewable	No OCGT, No CAISO Revenue	0.0	28.4	29.1	0.0	0.0	83.5	74.3	24.2	0.0
11	HBH	Carbon Free	No Hydro, No OCGT									
12	HBH	Renewable	No Hydro, No OCGT	0.0	28.4	29.1	0.0	0.0	83.5	74.3	24.2	0.0
13	HBH	Carbon Free	No Hydro, No OCGT, No CAISO Revenue									
14	HBH	Renewable	No Hydro, No OCGT, No CAISO Revenue	0.0	28.4	29.1	0.0	0.0	83.5	74.3	24.2	0.0
15	CN	Carbon Free		0.0	26.1	0.0	0.0	0.0	100.0	7.7	0.0	0.0
16	CN	Renewable		0.0	26.1	0.0	0.0	0.0	100.0	7.7	0.0	0.0
17	CN	Carbon Free	No Hydro									
18	CN	Renewable	No Hydro	0.0	26.1	0.0	0.0	0.0	100.0	7.7	0.0	0.0
19	CN	Carbon Free	No OCGT	0.0	26.1	0.0	0.0	0.0	100.0	7.7	0.0	0.0
20	CN	Renewable	No OCGT	0.0	26.1	0.0	0.0	0.0	100.0	7.7	0.0	0.0
21	CN	Carbon Free	No CAISO Revenue									
22	CN	Renewable	No CAISO Revenue									
23	CN	Carbon Free	No OCGT, No CAISO Revenue									
24	CN	Renewable	No OCGT, No CAISO Revenue									
25	CN	Carbon Free	No Hydro, No OCGT									
26	CN	Renewable	No Hydro, No OCGT	0.0	26.1	0.0	0.0	0.0	100.0	7.7	0.0	0.0
27	CN	Carbon Free	No Hydro, No OCGT, No CAISO Revenue									
28	CN	Renewable	No Hydro, No OCGT, No CAISO Revenue									

Source: Energeia research and analysis
Notes: HBH = Hour-by-hour, CN = Carbon Neutral

ENERGEIA

Detailed Scenario Results (2/3)

Costs by Resource ($M/Yr)

#	Scenario	Electricity Type	Scenario Summary	Solar	Wind	Geother-mal	Small Hydro	Large Hydro	4-Hour BES	8-Hour BES	12-Hour PES	OCGT
1	HBH	Carbon Free		$0.0	$3.3	$7.3	$0.0	$0.0	$5.3	$14.4	$3.3	$12.9
2	HBH	Renewable		$0.0	$3.3	$7.3	$0.0	$0.0	$5.3	$14.4	$3.3	$12.9
3	HBH	Carbon Free	No Hydro									
4	HBH	Renewable	No Hydro	$0.0	$3.3	$7.3	$0.0	$0.0	$5.3	$14.4	$3.3	$12.9
5	HBH	Carbon Free	No OCGT	$0.0	$2.4	$18.8	$0.0	$0.0	$10.6	$16.4	$7.5	$0.0
6	HBH	Renewable	No OCGT	$0.0	$2.4	$18.8	$0.0	$0.0	$10.6	$16.4	$7.5	$0.0
7	HBH	Carbon Free	No CAISO Revenue	$0.0	$3.3	$7.3	$0.0	$0.0	$5.3	$14.4	$3.3	$12.9
8	HBH	Renewable	No CAISO Revenue	$0.0	$3.3	$7.3	$0.0	$0.0	$5.3	$14.4	$3.3	$12.9
9	HBH	Carbon Free	No OCGT, No CAISO Revenue	$0.0	$2.4	$18.8	$0.0	$0.0	$10.6	$16.4	$7.5	$0.0
10	HBH	Renewable	No OCGT, No CAISO Revenue	$0.0	$2.4	$18.8	$0.0	$0.0	$10.6	$16.4	$7.5	$0.0
11	HBH	Carbon Free	No Hydro, No OCGT									
12	HBH	Renewable	No Hydro, No OCGT	$0.0	$2.4	$18.8	$0.0	$0.0	$10.6	$16.4	$7.5	$0.0
13	HBH	Carbon Free	No Hydro, No OCGT, No CAISO Revenue									
14	HBH	Renewable	No Hydro, No OCGT, No CAISO Revenue	$0.0	$2.4	$18.8	$0.0	$0.0	$10.6	$16.4	$7.5	$0.0
15	CN	Carbon Free		$0.0	$2.2	$0.0	$0.0	$0.0	$12.7	$1.7	$0.0	$0.0
16	CN	Renewable		$0.0	$2.2	$0.0	$0.0	$0.0	$12.7	$1.7	$0.0	$0.0
17	CN	Carbon Free	No Hydro									
18	CN	Renewable	No Hydro	$0.0	$2.2	$0.0	$0.0	$0.0	$12.7	$1.7	$0.0	$0.0
19	CN	Carbon Free	No OCGT	$0.0	$2.2	$0.0	$0.0	$0.0	$12.7	$1.7	$0.0	$0.0
20	CN	Renewable	No OCGT	$0.0	$2.2	$0.0	$0.0	$0.0	$12.7	$1.7	$0.0	$0.0
21	CN	Carbon Free	No CAISO Revenue									
22	CN	Renewable	No CAISO Revenue									
23	CN	Carbon Free	No OCGT, No CAISO Revenue									
24	CN	Renewable	No OCGT, No CAISO Revenue									
25	CN	Carbon Free	No Hydro, No OCGT									
26	CN	Renewable	No Hydro, No OCGT	$0.0	$2.2	$0.0	$0.0	$0.0	$12.7	$1.7	$0.0	$0.0
27	CN	Carbon Free	No Hydro, No OCGT, No CAISO Revenue									
28	CN	Renewable	No Hydro, No OCGT, No CAISO Revenue									

Source: Energeia research and analysis
Notes: HBH = Hour-by-hour, CN = Carbon Neutral

ENERGEIA

Detailed Scenario Results (3/3)

Totals ($M/Yr)

#	Scenario	Electricity Type	Scenario Summary	Resources	RA/AS/FRA	CAISO	Net
1	HBH	Carbon Free		$46.5	$0.0	-$3.9	$42.6
2	HBH	Renewable		$46.5	$0.0	-$3.9	$42.6
3	HBH	Carbon Free	No Hydro				
4	HBH	Renewable	No Hydro	$46.5	$0.0	-$3.9	$42.6
5	HBH	Carbon Free	No OCGT	$55.6	$0.0	-$5.8	$49.8
6	HBH	Renewable	No OCGT	$55.6	$0.0	-$5.8	$49.8
7	HBH	Carbon Free	No CAISO Revenue	$46.5	$0.0	$0.0	$46.5
8	HBH	Renewable	No CAISO Revenue	$46.5	$0.0	$0.0	$46.5
9	HBH	Carbon Free	No OCGT, No CAISO Revenue	$55.6	$0.0	$0.0	$55.6
10	HBH	Renewable	No OCGT, No CAISO Revenue	$55.6	$0.0	$0.0	$55.6
11	HBH	Carbon Free	No Hydro, No OCGT				
12	HBH	Renewable	No Hydro, No OCGT	$55.6	$0.0	-$5.8	$49.8
13	HBH	Carbon Free	No Hydro, No OCGT, No CAISO Revenue				
14	HBH	Renewable	No Hydro, No OCGT, No CAISO Revenue	$55.6	$0.0	$0.0	$55.6
15	CN	Carbon Free		$16.5	$0.0	$0.5	$17.0
16	CN	Renewable		$16.5	$0.0	$0.5	$17.0
17	CN	Carbon Free	No Hydro				
18	CN	Renewable	No Hydro	$16.5	$0.0	$0.5	$17.0
19	CN	Carbon Free	No OCGT	$16.5	$0.0	$0.5	$17.0
20	CN	Renewable	No OCGT	$16.5	$0.0	$0.5	$17.0
21	CN	Carbon Free	No CAISO Revenue				
22	CN	Renewable	No CAISO Revenue				
23	CN	Carbon Free	No OCGT, No CAISO Revenue				
24	CN	Renewable	No OCGT, No CAISO Revenue				
25	CN	Carbon Free	No Hydro, No OCGT				
26	CN	Renewable	No Hydro, No OCGT	$16.5	$0.0	$0.5	$17.0
27	CN	Carbon Free	No Hydro, No OCGT, No CAISO Revenue				
28	CN	Renewable	No Hydro, No OCGT, No CAISO Revenue				

Source: Energeia research and analysis
Notes: HBH = Hour-by-hour, CN = Carbon Neutral

ENERGEIA

VCE Community Advisory Committee Meeting – December 16, 2021 via video/teleconference

Item 10 – VCE Three-Year Strategic Plan Update

Public Comments

To Provide Public Comment on any agenda item please:

- E-mail 300 words or less to: meetings@valleycleanenergy.org

OR

Join the Public Comment Queue by

- "Raising Hand" on Zoom Meeting

OR

- Press *9 if joining by phone

Emailed comments received **before** the item has concluded will be read into the record.

Emailed comments received **after** the item has concluded but before the end of the meeting will not be read but will be included in the meeting record.

VALLEY CLEAN ENERGY

Item 10 - VCE Three-Year Strategic Plan Update

Overview

Inform the general manager and CAC of the summarized progress on the VCE Three-Year Strategic Plan goals ratified at the November 12, 2020.

Quarterly Report to VCE Management

- Staff will report quarterly to the Interim General Manager on the status of goals, objectives and metrics for which they are responsible.

- Annual Report to Board and CAC Staff
  - Staff will report annually to the Board and CAC on the status of goals, objectives and metrics, and will recommend any mitigations or amendments as may be necessary for Board approval.

VALLEY CLEAN ENERGY

Item 10 - Goal 1 - FINANCIAL STRENGTH

Maintain grow a strong financial foundation and manage costs to achieve long-term organizational health.

1.1 - Maintain consistently healthy cash reserves to fund VCE's mission, vision, and goals.
1.2 - Achieve an investment grade credit rating by end of 2024.
1.3 - Commit to fiscal efficiencies to build a program foundation from which to deliver customer and community value.
1.4 - Manage customer rates to optimize VCE's financial health while maintaining rate competitiveness with PG&E.

Obj	Key Developments	Planned Activities
1.1	1. Developed collections policy for review by CAC & Board 2. Renewed credit line with RCB through calendar 2021. 3. Received preliminary CAPP approval for funding ~$800K of COVID related receivables	1. Collections policy approval Q1 2022 2. Renew credit line for CY 2022
1.2	1. Budgeted for a financial advisor to support the process of establishment of first credit rating	1. Issue RFP for financial advisor Q1 2022
1.4	1. Adopted cost-based rate policy 2. Implemented rate change to maintain cash reserve minimums	1. Develop an additional analytics model for cost study and long-term rates.

VALLEY CLEAN ENERGY

Item 10 - Goal 2 - PROCUREMENT & POWER SUPPLY

Manage power supply resources to consistently exceed California's Renewable Portfolio Standard (RPS) while working toward a resource portfolio that is 100% carbon neutral by 2030.

2.1 - Continue to identify and pursue cost effective local renewable energy resources.
2.2 - Acquire sufficient bundled energy and renewable resources to achieve VCE's greenhouse gas reduction targets.
2.3 - Deploy storage and other strategies to achieve renewable, carbon neutral, resource adequacy, and resiliency objectives.
2.4 - Identify and pursue cost effective, local distributed energy (e.g., behind the meter rooftop Solar + storage) resources to help meet reliability needs.
2.5 - Study and present options for achieving a 100% carbon neutral resource portfolio as well as 100% carbon free resource portfolio (carbon free hour by hour) by 2030.
2.6 - Optimize the hedging strategy to mitigate risk in accordance with the energy risk guidelines and procurement plan.

Obj	Key Developments	Planned Activities
2.2	1. In Q1 2021, executed a 90MW PV +75MW BESS 20 yr. PPA will provide VCE stable, low-cost power and resource adequacy.	1. COD Expected in late 2022.
2.3	1. Participation in RFP with CC power for long-duration storage. We are currently negotiating (2) 8-hour battery storage systems to bring forward Q122. 2. RFO issued through CC Power for firm resources "geothermal." Both efforts support the CPUC decision - Bids expected Q421. Note: Both support CPUC mandate for additional resources - Reference R. 20-05-003	1. Evaluate firm resource proposals and contract awards by Q322.
2.5	1. Carbon neutrality task group – Awarded RFP to study has progressed with an expected final report to be delivered in January 2022 to Board – See companion item #8	

VALLEY CLEAN ENERGY

Item 10 - Goal 3 - CUSTOMERS & COMMUNITY (3.1-3.4)

Prioritize VCE's community benefits and increase customer satisfaction and retention.

3.1 - Develop engagement strategies to increase awareness of, and participation in, local control of VCE's energy supply and programs with a particular focus on engaging disadvantaged and historically marginalized communities.

3.2 - Develop programs and initiatives to better support community goals, including supporting member agency achievement of energy-sector emissions reduction targets.

3.3 - Design and implement a strategy to more effectively engage local business and agricultural customers.

3.4 - Build awareness and trust of the VCE brand through direct engagement with customers, communities and organizations.

Obj	Key Developments	Planned Activities
3.1	1. Initiated a mini-campaign in partnership with Davis Food Co-op on UltraGreen opt-ups, including collateral for the campaign. 2. Rolled out an online platform for customers to easily opt up online without their PG&E account	1. Analyze opt-up numbers in Q2 2022
3.2	1. Followed up on cost analysis for all member jurisdictions to opt up to UltraGreen, re-initiated conversations about opting up.	1. Follow up with city staff
3.3	1. Initiated ag AutoDR pilot and getting ready to deploy outreach to key ag customers	1. Outreach to key ag customers in Q1-2 2022
3.4	1. Directly engaged with Mutual Housing management staff and conducted three public meetings (1 in Spanish) and a lot of direct engagement with management and customers. This resulted in much more awareness of VCE's brand and activities. 2. Made significant improvements to the website, including adding content on carbon-free vs. renewables, highlighting key UltraGreen customers on the homepage, updating FAQs, updating the financial resources page, and adding the VCE Power Contract map. 3. Staff conducted two educational presentations in schools about VCE and climate change	1. Continue to engage and continue conversations about partnering on programs, e.g., multi-family EV charging

VALLEY CLEAN ENERGY

Item 10 - Goal 3 - CUSTOMERS & COMMUNITY (3.5-3.7)

Prioritize VCE's community benefits and increase customer satisfaction and retention.

3.5 - Develop customer programs and initiatives that prioritize decarbonization, community resiliency and customer savings.

3.6 - Measure and increase customer satisfaction, using tools such as surveys and focus groups, while maintaining an overall participation rate of no less than 90%.

3.7 - Integrate and address the concerns and priorities of emerging and historically marginalized communities in the design and implementation of VCE's services and programs.

Obj	Key Developments	Planned Activities
3.5	1. Made significant progress on three programs in Q3-4 2021. Ag pilot approved by the CPUC; programs for both EV rebates and heat pump rebates. 2. Staff was invited to present on building decarbonization to the Woodland Sustainability Committee (WSC) in January 2022	1. Design/Implementation forms for EV rebates and heat pumps 2. Tier 2 advice letter to be filed with CPUC for ag pilot in January 2022. 3. Present to WSC in Jan-22.
3.6	1. Maintained customer participation rate of over 90%	1. Continue to monitor opt-out trends.
3.7	1. Participating in Arrearage Management Program (AMP) and Percentage Income Payment Plan (PiPP) with PG&E and other CCAs so that customers at high risk of disconnection can get support in paying arrearages and avoid disconnection.	1. Monitor AMP and PiPP implementation with PG&E and SMUD. 2. Continue posting in Spanish, measure success in March 2022.

VALLEY CLEAN ENERGY

Item 10 - Goal 4 - DECARBONIZATION & GRID INNOVATION

Promote and deploy local decarbonization and grid innovation programs to improve grid stability, reliability, community energy resilience, and safety.

4.1 - Working with a variety of local, regional and state partners, develop a grid innovation roadmap for VCE's service territory that supports community energy resilience and reliability.
4.2 - Develop a VCE decarbonization roadmap to guide near and long-term program decisions and offerings.
4.3 - Increase participation in VCE's UltraGreen 100% renewable product.
4.4 - Identify external funding sources to support decarbonization and grid-related programs and initiatives.

Obj.	Key Developments	Planned Activities
4.1	1. Worked w/ the CAC on a building electrification statement. The Board adopted a statement supporting and encouraging the electrification of new buildings.	1. Engage with the County of Yolo planning commission on decarbonization efforts.
4.3	1. Followed up with member jurisdiction staff for UltraGreen Analysis & adoption 2. Initiated a mini-campaign in partnership with Davis Food Co-op on UltraGreen opt-ups, including collateral for the campaign. 3. Rolled out an online platform for customers to easily opt up online without their PG&E account number	1. Continue to identify opt-up solutions for member jurisdictions 2. Analyze VCE opt-up numbers in Q2 2022
4.4	1. Applied for County of Yolo American Rescue Plan funding for downtown Winters reliability upgrade 2. Applied for funding to CPUC under the Reliability OIR to develop and deploy an agricultural autoDR pilot. Received $3.25M in funds for the 3-year pilot.	1. Continue to identify ARP and other funding sources with member districts, state, and federal agencies. 2. Tier 2 advice letter to be filed Jan 5, 2022.

VALLEY CLEAN ENERGY

Item 10 - Goal 5 - REGULATORY & LEGISLATIVE AFFAIRS

Strongly advocate for public policies that support VCE's Vision/Mission.

5.1 - Work with CalCCA and other partners to proactively engage State regulators, legislators, and other State authorities in developing policy that furthers VCE's mission and facilitates our contributions to decarbonization, grid reliability, energy resiliency, affordability, local programs and social equity.
5.2 - Develop relationships with community stakeholder organizations that foster support for VCE's mission and vision.
5.3 - Optimize regulatory compliance activities.

Obj	Key Developments	Planned Activities
5.1	1. Actively engaged in CalCCA sponsored legislation on PCIA – SB 612 (Portantino) 2. Active support of AB 843 (Aguiar-Curry) – access for CCA's to BioMat resources 3. CAC Leg/Reg Task Group – bi-weekly meeting	1. Ongoing engagement in support legislation related to CCAs
5.2	1. Identify key stakeholder groups within VCE service territory – in process, 2. Attended Winters Chamber of Commerce on 4.12.21 3. Met with Cool Davis to explore formalizing a relationship to work on shared decarbonization and electrification goals.	1. Decision around a structure to formalize (e.g., MOU)
5.3	1. Engaged with CalCCA PCIA forecasting team to make more informed forecasts of PCIA and PG&E rates.	1. Recruitment of Regulatory Staffing

VALLEY CLEAN ENERGY

Item 10 - Goal 6 - ORGANIZATION, WORKPLACE & TECHNOLOGY

Analyze and implement optimal long-term organizational, management, and information technology structure at VCE.

6.1 - Develop a roadmap to evaluate and guide future steps toward formation of a local Publicly Owned Utility (POU).
6.2 - Evaluate and pursue opportunities for shared services with other CCAs for certain functions.
6.3 - Develop an evaluation framework to guide future expansion opportunities beyond the existing service territory.
6.4 - Identify optimal management, staffing and contracting structure of VCE in the near and long term; factors include balance of internal staff vs. consultant support services, transition of leadership positions to permanent internal employees.
6.5 - Promote diversity, equity and inclusion in leadership, hiring, promotion, and contracting policies.
6.6 - Support health, wellness and a productive workplace.
6.7 - Create an innovation-focused culture that rewards proactive participation, problem solving, new ideas, and creative use of partnerships.
6.8 - Deploy a modernized IT infrastructure that enables knowledge management, analytics and collaboration through robust use of data and information

Obj.	Key Developments	Planned Activities
6.1	1. Continuing to monitor POU formation activities in PG&E service territory.	1. Outreach to CMUA
6.2	1. Continued Board and staff level engagement with CC Power for joint CCA procurement 2. Participation with the City of Stockton regarding the City's CCA feasibility study	
6.3	1. Continuing investigation of other CCA expansion evaluation methods used in the process.	
6.4	1. Budgeted (1) half time regulatory Analyst and (1) Intern for Marketing and Support	1. Recruitment for Analyst & Intern for 2022.
6.8	1. Working with County of Yolo GIS team on VCE platform for Dashboard and GIS mapping 2. Adopted Datto as an organizational network drive	1. Implement Dashboard and GIS Mapping

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