Valley Clean Energy

IRP Workshop
April 26, 2018

Proposed CAC Work Session Agenda

		Time (min)
1	Agenda overview and meeting objective	10
2	IRP overview, timelines and requirements	15
3	Climate Action Plans and VCEA	10
4	Load forecasts and Resource Needs	10
5	Resource Options, Costs and Market Prices	30
6	CPUC Compliant Portfolio – Example	15
7	VCEA's short and long term vision	10
8	Proposed Approach	10
9	Discussion and inputs from advisory committee, board members and public	40
		150

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Workshop Objective

- Present overview of IRP process and regulatory requirements
- Provide information on expected electric demand, potential supply alternatives, and cost implications
- Seek inputs/guidance on resource preferences
- Seek inputs/guidance on 3 year action plan and studies to be undertaken
- Provide inputs to guide resource procurement and long term contracting in the next 1-3 years

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Critical Timelines

- February 8 – CPUC IRP Decision
- April 26 – CAC Work Session
- Late May/Early June – Draft IRP Report
- July – VCEA Board Approves IRP
- August 1 – VCEA Submits IRP to CPUC

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Key Issues for VCEA

- **Long term Vision/Mission/Objectives and Action Plan with respect to**
  - Resource mix
  - Local sources
  - Battery storage
  - Demand-side programs (EV, EE DR, etc)
  - Costs / Rates
  - GHG targets

- **Near to mid term resource supply**

- **Regulatory Compliance**

- **Approval and public stakeholder review process**

- **Retaining operational and strategic flexibility**

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CPUC-Required IRP Features
(Based on CPUC Decision and IRP Template)

- 1-3 year action plan
- Covers 2018-2030
- Must include at least one conforming portfolio based on 2017 IEPR Mid Demand Case
- Report on GHG emissions of portfolio
- Methodology explanation
- Demonstrate compliance with PUC 454.52(a)(1), i.e. GHG, RPS, Just and reasonable rates, minimize ratepayer bills, reliability, diversity and sustainability, local pollution, distribution systems

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RPS Requirements

- “Each retail seller shall procure a minimum quantity of eligible renewable energy resources....33[%] by 2020, 40[%] by 2024, 45[%] by 2027 and 50[%] by 2030” (PUC 399.15(b))

- “In order to achieve a balanced portfolio all retail sellers shall meet the following requirements...”. For post-2016 periods (PUC 399.16(b)-(c)
  - At least 75% PCC1
  - No more than 25% PCC2
  - No More than 10% PCC3

- “... Beginning January 1, 2021, at least 65[%] of the procurement a retail seller counts towards the renewables portfolio standard requirement of each compliance period shall be from its contracts of 10 years or more..., or in its ownership...” (PUC 399.13(b))

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SB350 – Doubling Energy Efficiency

- SB 350 Requires Doubling of Energy Efficiency by 2030
- PG&E has updated its 2017 IEPR forecast to reflect additional achievable energy efficiency
- For PG&E Service territory the additional EE impact to comply with SB350 is estimated to a 13% demand reduction per year by 2030
- The impact for VCEA is estimated to 100 GWh per year, equivalent to annual energy consumption of about 10,000 electric vehicles or the total output of a 60 MW solar power plant
- PG&E will continue to manage EE programs in VCEA's service territory. In the future, VCEA may want to explore its own EE programs as well as potentially assuming overall program responsibilities from PG&E. SMUD recommends that this be revisited in future IRPs
- Impact of additional Energy Efficiency considered in forecasts

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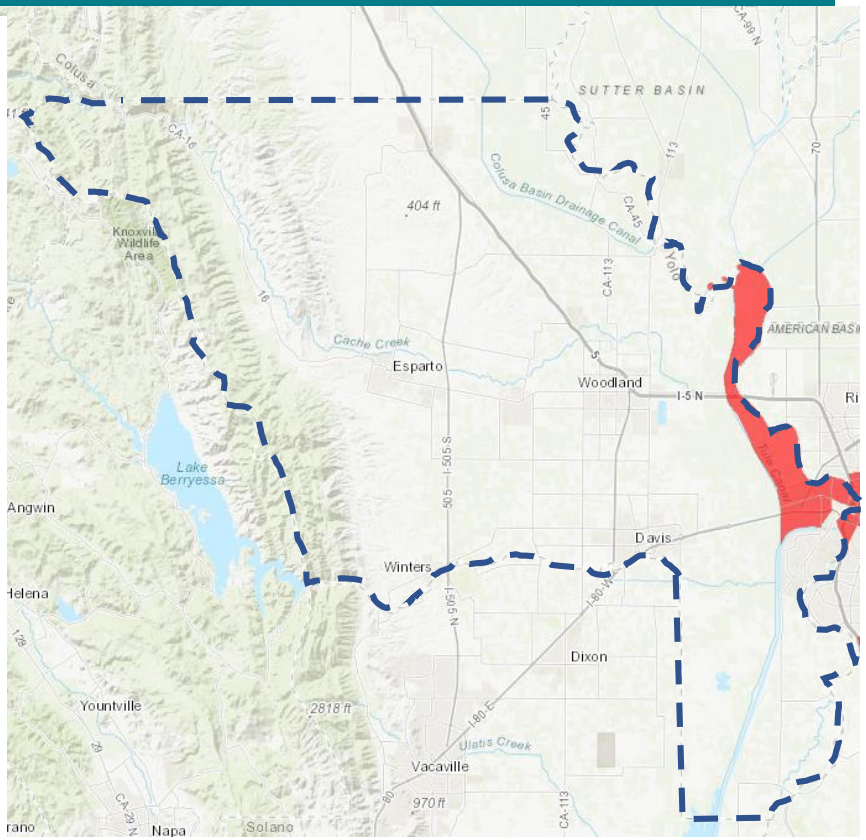
Disadvantaged Communities

- VCEA is required to demonstrate how its preferred portfolio minimizes "localized air pollutants and other GHG emissions with early priority on disadvantaged communities
- Top 25% of CalEnviroScreen 3.0 impacted census tracts – Only four census tracts are impacted – all in West Sacramento or just north thereof
- Similar to other Yolo county residents, residents in disadvantaged communities are expected to experience a (slight) reduction of GHG emissions as a result of CCA activities
- Impacts on communities outside VCEA's service territory are harder to measure but are expected to be positive or neutral



Source: CalEnviroScreen 3.0 (https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30)

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Additional IRP Requirements

Additional IRP Requirements in PUC 454.52(a)	Proposed approach
Meet state GHG goals	Base plan on CPUC Reference Portfolio
Just and reasonable rates	Competitive w PG&E
Minimize impacts on rate payer bills	Keep rates competitive with PG&E and build reserves for programs
Ensure system and local reliability	Procure reserves per CAISO and CPUC requirements

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Climate Action Plans and VCEA

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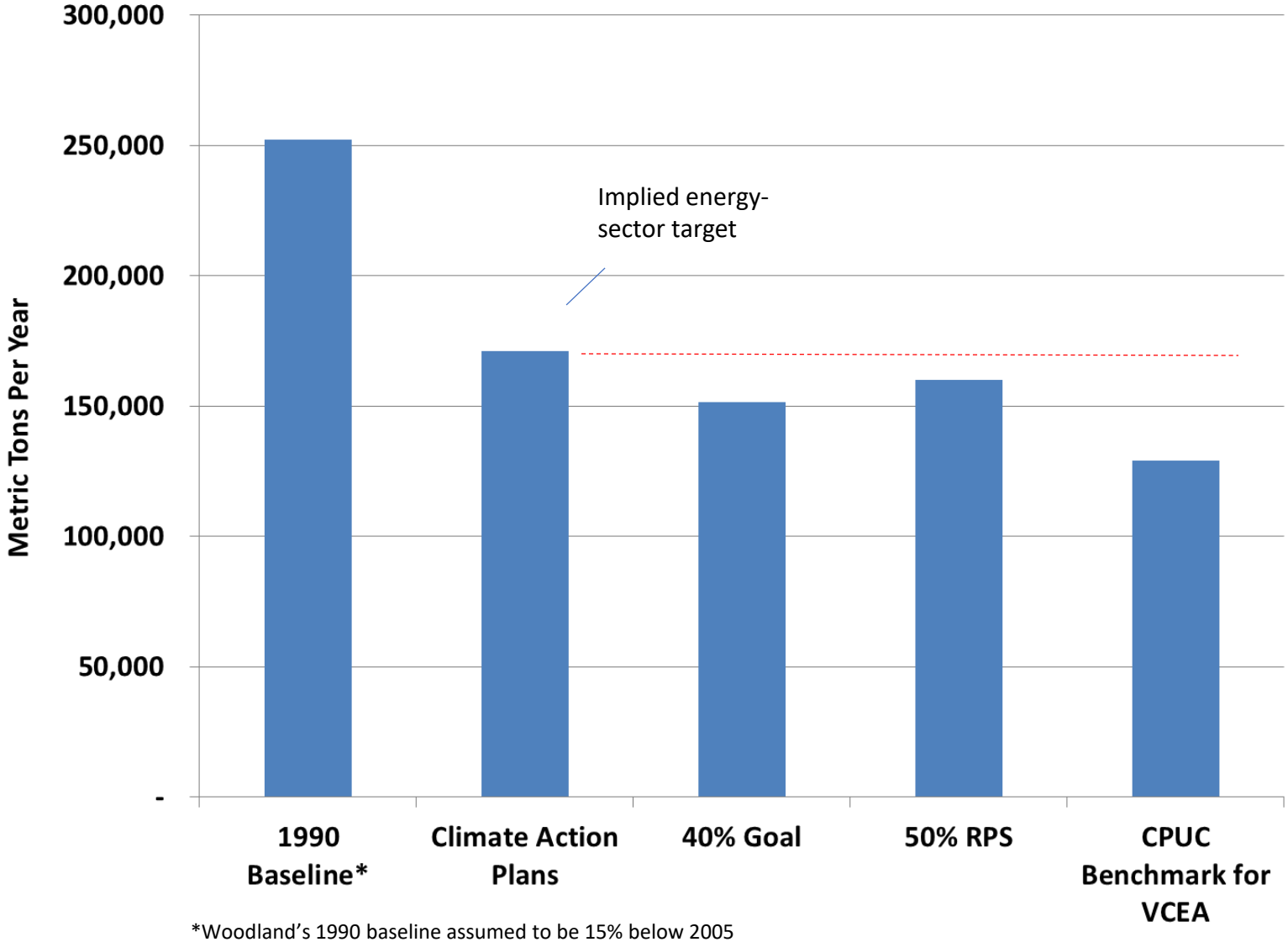
City and County Climate Action Plans

	Yolo County	City of Woodland	City of Davis
Adoption	2011	2017	2010
Climate goal(s)	1990 levels by 2020 27% below 1990 by 2030 53% below 1990 by 2040 80% below 1990 by 2050	15% below 2005 by 2020 53% below 2005 by 2035*	28% below 1990 by 2020 80% below 1990 by 2040 Carbon neutral by 2050
GHG Electricity Emissions (Base Year)	131,662 MT (1990)	72,010 (2005)	59,528 (1990)
Energy Efficiency	Reduce energy consumption in new and existing residential and non-residential units	Reduce building energy use through lighting efficiency, appliance upgrades, building efficiency, temperature controls and conservation education	Reduce total energy use in Davis by 5% from 2010 levels; Achieve net-zero new buildings
Renewable Energy	Pursue CCA	Increase renewable energy use (CCA mentioned)	5% of electricity consumption from local renewables
	Increase onsite renewable generation		
	Promote on-farm renewables		
Water	Reduce consumption in existing buildings		
	Promote weather-based irrigation		
	+Supporting measures identified		

2030 GHG Targets (Energy Sector Only)



*Woodland's 1990 baseline assumed to be 15% below 2005

Sources: Davis Climate Change and Adaptation Plan (2010); Woodland Climate Action Plan (2017); Yolo County Climate Action Plan (2011); CPUC; Senate Bill 350

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VCEA's Role in County Climate Action Activities

- Progress towards climate goals by VCEA jurisdictional entities is unknown since funding for M&V has been scarce so far.

- Climate Action Plans imply a joint electricity sector emissions goal of ~170K tons of CO2 for 2030, assuming a proportional implementation of reductions across all emission sectors

- Energy sector emissions (mainly related electricity and gas), represents between 20-50% of the total GHG emissions of Woodland, Davis and the Unincorporated parts of Yolo county. The formation of a CCA is therefore an important milestone that will help facilitate GHG reductions from the energy sector

- Revised California climate change goals require GHG emissions at 40% below 1990 by 2030. This is slightly more ambitious than the envisioned total GHG emissions of climate action plans by Yolo, Woodland and Davis.

- CPUC and ARB Benchmark for GHG emissions for VCEA in 2030 is 129K tons

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Load Forecast and Resource Needs

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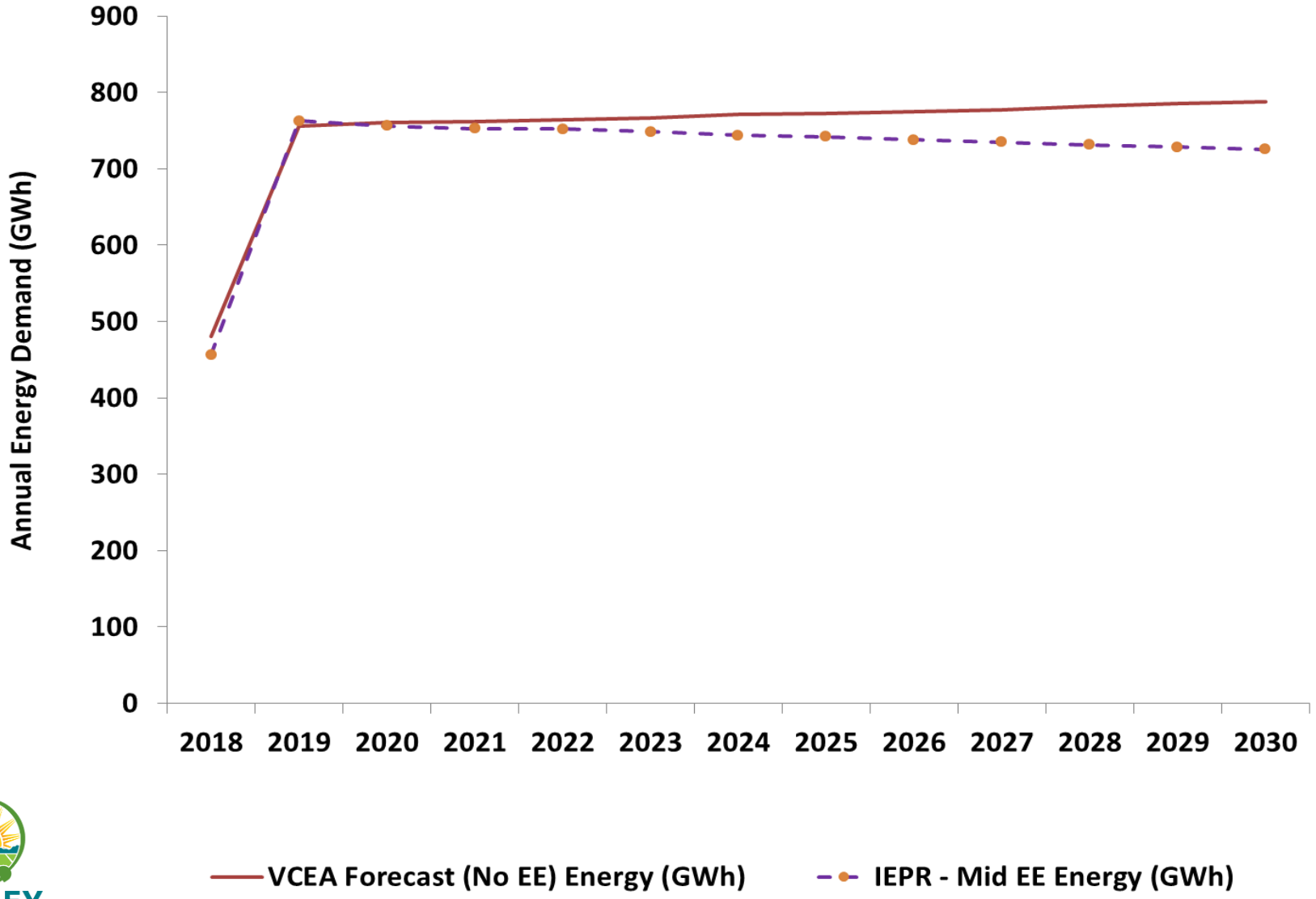
Electric Demand Forecast (GWh)



Sources: SMUD; CEC

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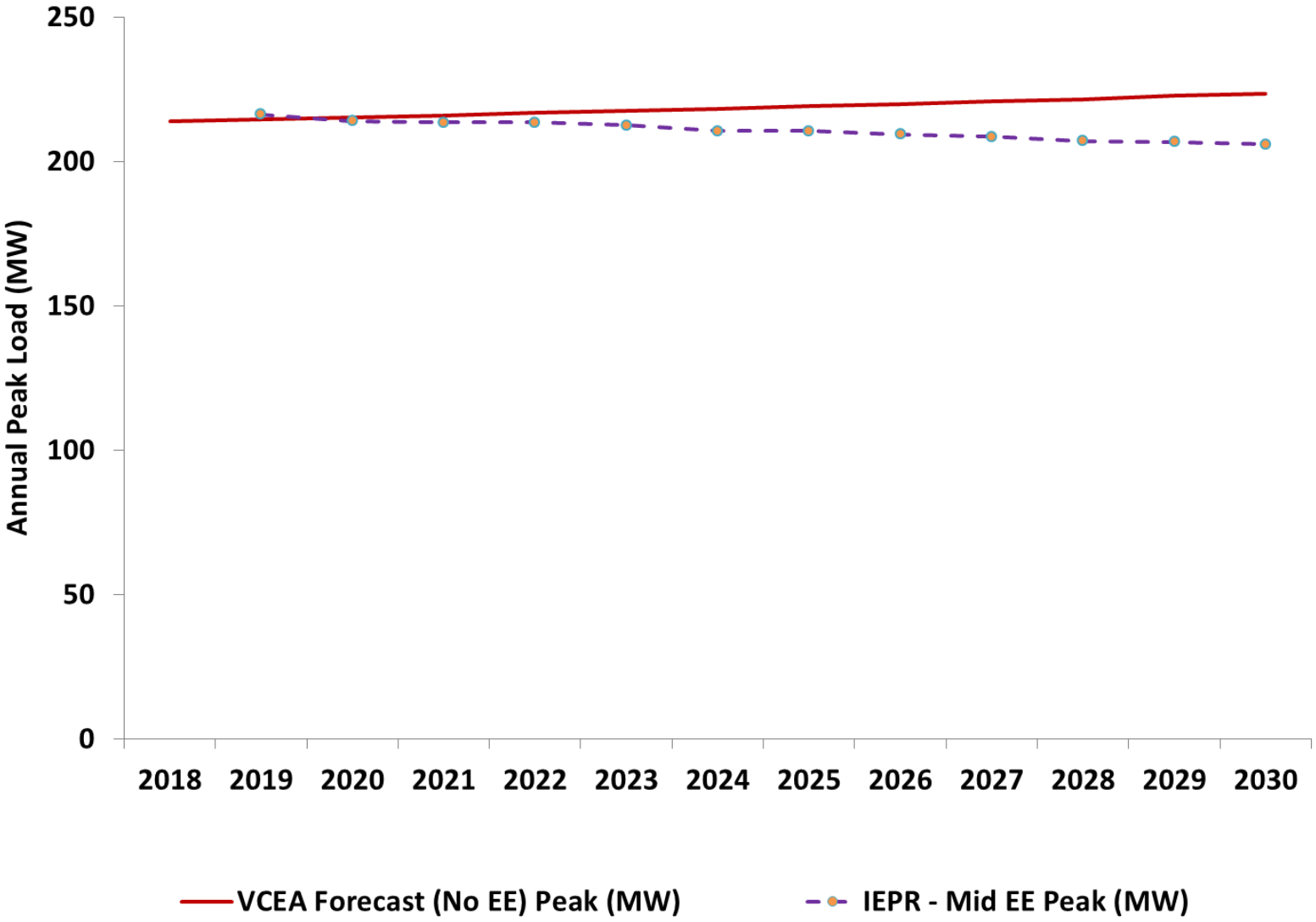
Electric Peak Demand Forecast (MW)



Sources: SMUD; CEC

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Resource Needs (Based on VCEA forecast)

	2018	2019	2020	2021	2022	2026	2030
Electricity Demand (GWh)	504	793	797	798	801	813	826
Contracted Energy (GWh)	351	189					
Contracted Carbon Free (GWh)	147	83					
Energy Needed (GWh)	**6**	**522**	**797**	**798**	**801**	**813**	**826**
Peak Load plus Reserves (MW)	236	238	239	240	241	244	248
Contracted Capacity (MW)	236						
Capacity Needed (MW)	**0**	**238**	**239**	**240**	**241**	**244**	**248**
RPS Target	42%	42%	TBD	TBD	TBD	TBD	TBD
REC PCC1	101,980	58,733					
REC PCC2	85,904	-					
RECs or Renewables Needed	**23,952**	**274,428**					

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Resource Options, Costs and Market Prices

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Resource Options and Costs

Near to Mid-Term

- Short Term Energy
- Short Term Capacity
- Short Term RECs

Mid to Long Term

- Hydro
- Solar
- Gas-Fired Generation
- Biofuels
- Battery
- Wind

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Availability of local* renewable resources in VCEA

	Potential (MW)	Existing (MW)
Biomass / biogas	171	91
Small Hydro	0	36
Wind	749	1,036
Solar PV	6,000+	163
Battery Storage	Not limited	2.4
Geothermal	135	1,634

Sources: California Energy Commission Tracking Progress, December 2017; California Public Utilities Commission RPS Calculator, version 6.2

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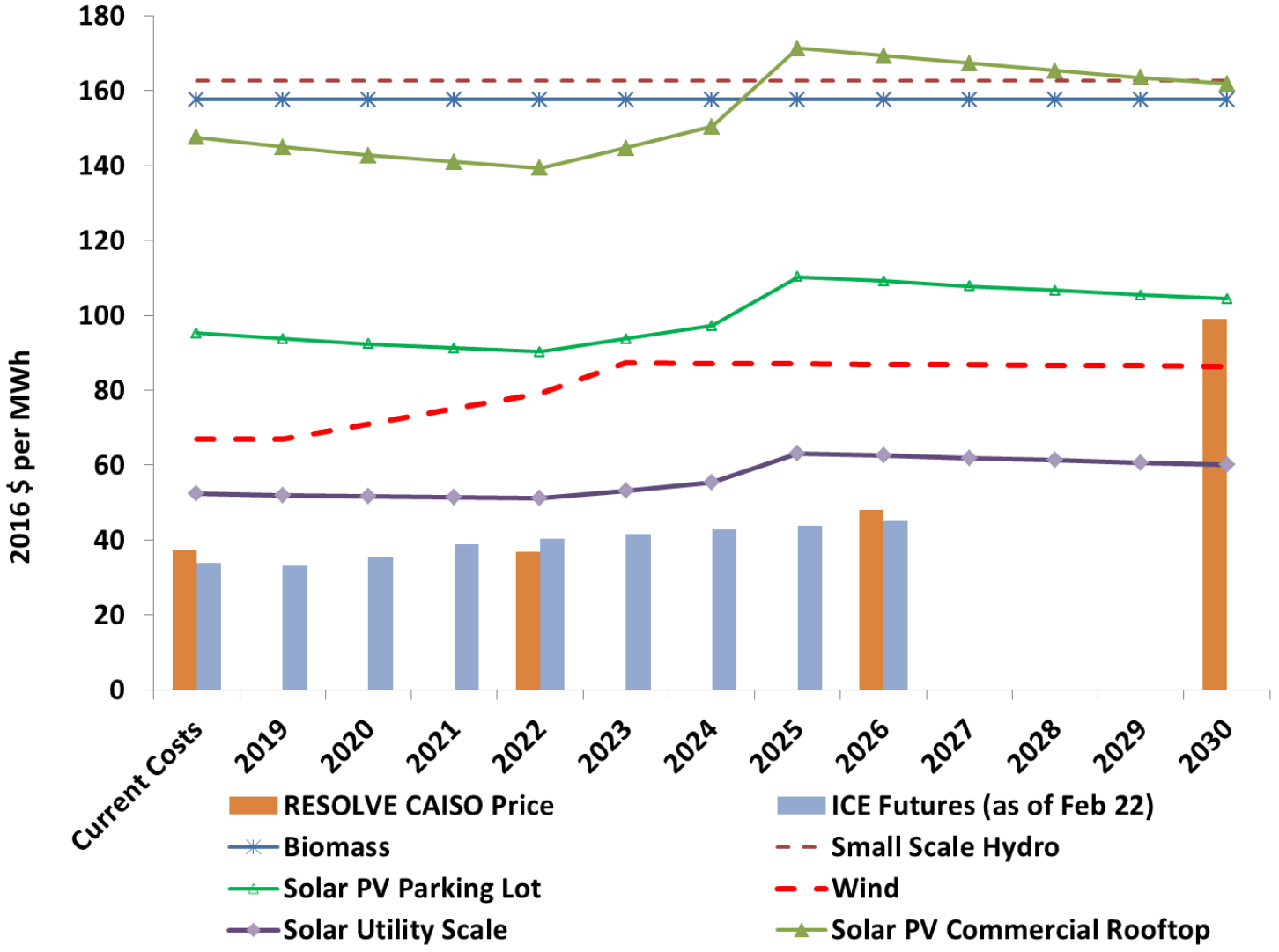
* Includes Yolo, Lake, Colusa, Yuba, Sacramento, Solano, Napa and Sonoma counties

Levelized Cost of New Supply ($/MWh)



Sources: CPUC; Intercontinental Exchange (ICE)

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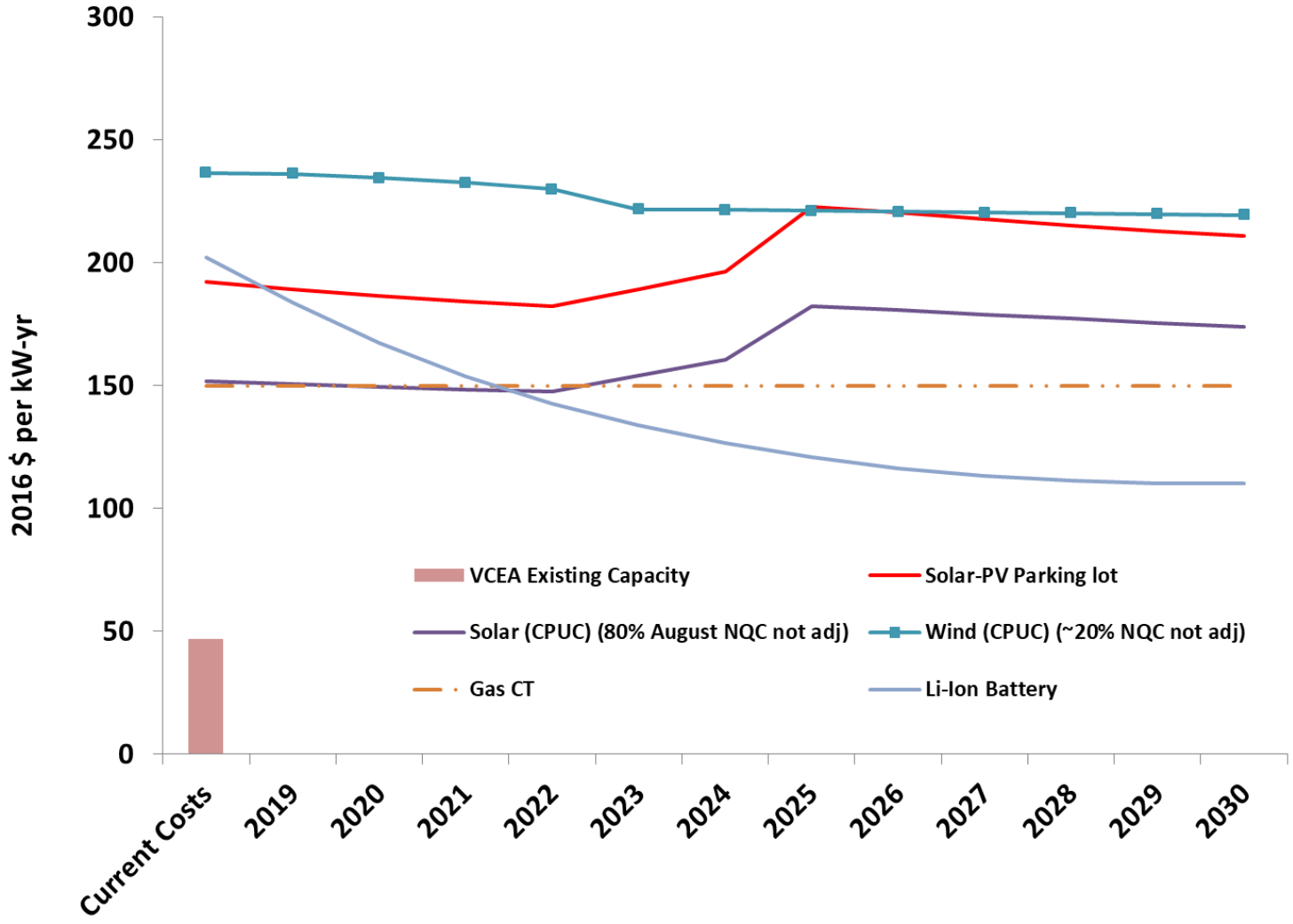
Levelized Cost of New Capacity for RA ($/kW-yr)



Sources: CPUC; SMUD (for existing market capacity)

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Three Sample 2030 Resource Portfolios

	Portfolio 1 **VCEA Load Forecast** (No Additional EE and DR)	**Portfolio 2** **IEPR Load Forecast** (42MMT/yr scenario and Mid-AAEE)	**Portfolio 3** **VCEA Load Forecast** (Local Resource Focus)
Electric Demand (GWh)	826	726	826
RPS (%)	50%	56%	80%
GHG Emissions (Metric Tons)	163,000	129,000	116,000
Percentage of load served with contracted resources	50%	64%	79%
Percentage of load from CAISO purchases	50%	36%	21%
Unbundled RECs	0	0	0

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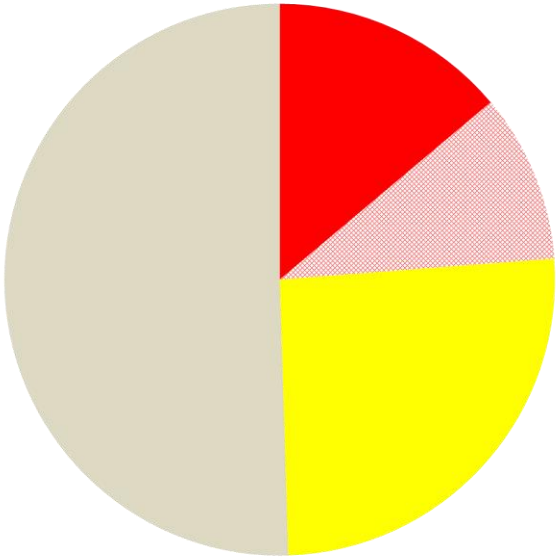
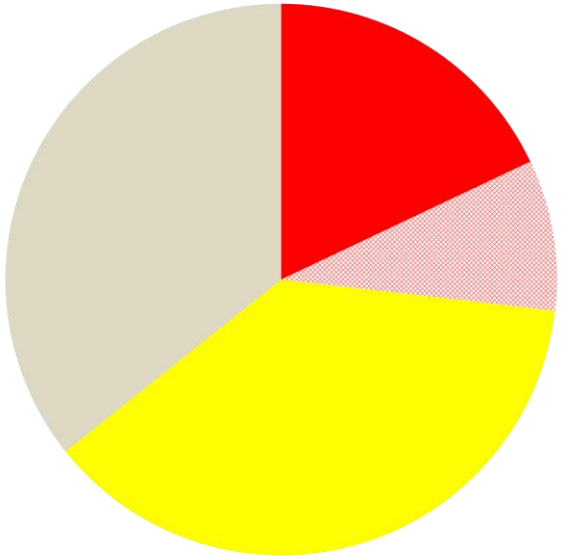
Three Sample 2030 Resource Portfolios – Generation Mix

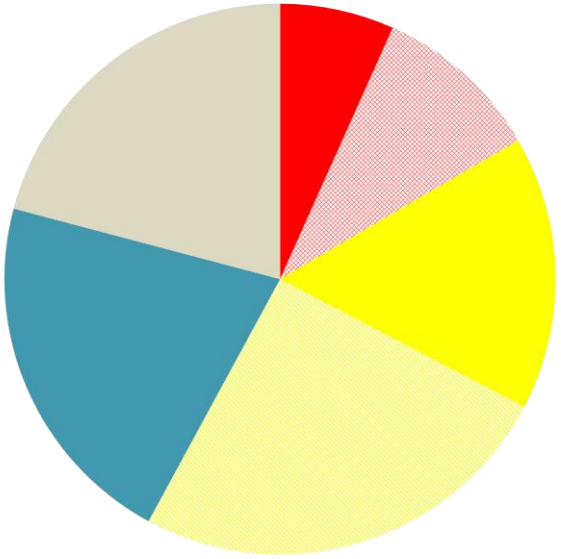
Portfolio 1 – Generation Mix (VCEA Basic)

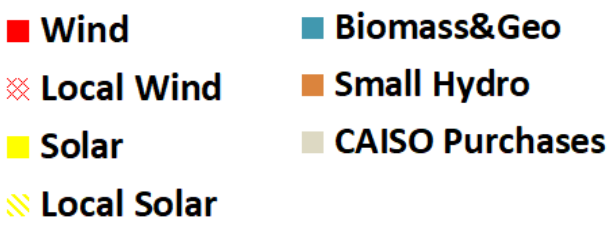


Portfolio 2 – Generation Mix (IEPR Forecast)



Portfolio 3 – Generation Mix (Local Focus)





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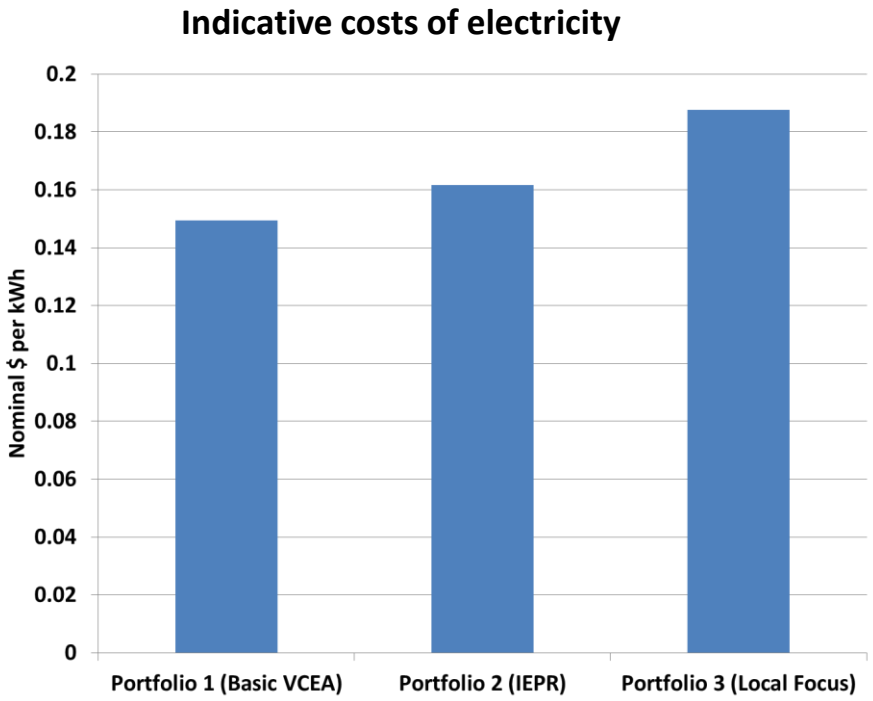
Portfolio Observations



- Selected portfolios are examples only – not optimized
- Estimated costs include carbon cost of $150/ton (about $65-75/MWh)
- Resource portfolio choice impacts costs
- Aggressive renewable portfolio will likely necessitate higher content of baseload bio fuels to maintain reliability and reduce curtailment exposure (more study needed)

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Vision and Action Plan – CAC and VCEA Direction

Near-Term Vision

The near-term vision for VCEA is to provide electricity users with greater choice over the sources and prices of the electricity they use, by:

- Offering basic electricity service with higher renewable electricity content, at a rate competitive with PG&E;
- Developing and offering additional low-carbon or local generation options at modest price premiums;
- Establishing an energy planning framework for developing local energy efficiency programs and local energy resources and infrastructure; and
- Accomplishing the goals enumerated above while accumulating reserve funds for future VCEA energy programs and mitigation of future energy costs and risks.

Long -Term Vision

The future vision for VCEA is to continuously improve the electricity choices available to VCEA customers, while expanding local energy-related economic opportunities, by:

- Causing the deployment of new renewable and low carbon energy sources;
- Evaluating and adopting best practices for planning and operational management;
- Substantially increasing the renewable electricity content of basic electricity service, with the ultimate goal of achieving zero carbon emissions electricity;
- Developing and managing programs for energy efficiency, on-site electricity production and storage;
- Accelerating deployment of local energy resources to increase localized investment, employment, innovation and resilience;
- Working to achieve the climate action goals of participating jurisdictions to shape a sustainable energy future; and
- Saving money for ratepayers on their energy bills.
- Remaining open to the participation of additional jurisdictions.

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Proposed Approach

- **IRP Contracting and Procurement:**
  Focus on meeting or exceeding RPS and Climate Mandates by using a combination of:
  - New local solar under long-term contracts in Yolo and Solano counties, depending on cost-competitiveness with other California renewable resources and availability
  - Existing local eligible renewable energy sources such as biomass, biogas, and small hydro depending on availability and price
  - Hydro resources to manage and improve GHG footprint
  - California-sourced renewable energy
  - CAISO Market Purchases and short term contracts to balance energy and capacity needs (no gas fired generation under LT contract)
  - Contract for battery storage capacity in line with regulatory requirements

- **IRP Action Plan**
  3-year action plan that can include roadmap for further actions and studies, such as:
  - Plans for resource solicitations (RFPs RFOs)
  - Building financial reserves to enable future programs
  - Feasibility study for siting of new battery storage, local solar and on-site/ on-farm renewables
  - Conduct impact study of creative new programs for residential and workplace energy supply, storage and vehicle charging
  - Roadmap for R&D funding

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Discussion

- Resource Mix – Are there preferred resources for near term and long term supply?
- What studies and actions to focus on in the next 1-3 years?
- Approach to storage?
- RPS and GHG Goals to 2030?

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