DOCKETED	
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EPIC Workshop on Virtual Power Plants and Demand Flexibility: Identifying R&D Needs

Dustin Davis, Energy Research and Development Division

July 18, 2023

Agenda

Time	Item
10:00 am	Welcome and Introduction • Housekeeping • Diversity Survey • EPIC Program Background
10:10 am	EPIC Demand Flexibility Research
10:20 am	Panel Discussion-1: Virtual Power Plant Technology Provider Perspectives • Moderated discussion & public comments
11:40 am	Panel Discussion-2: Load Serving Entity Perspectives • Moderated discussion & public comments
12:50 pm	Next Steps

Housekeeping

- Workshop is being recorded
- Workshop Event Webpage: https://www.energy.ca.gov/events
- Closed captioning is enabled
- Virtual Participation through Zoom
  - Q&A/Public comment during each panel discussion
  - Use Q&A Box feature
- Written Comments to Docket # 23-ERDD-01: https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=23-ERDD-01
- Deadline to submit comments: August 1, 2023, by 5:00 pm

Commitment to Diversity

The CEC adopted a resolution strengthening its commitment to diversity in our funding programs. The CEC continues to encourage disadvantaged and underrepresented businesses and communities to engage in and benefit from our many programs.

To meet this commitment, CEC staff conducts outreach efforts and activities to:

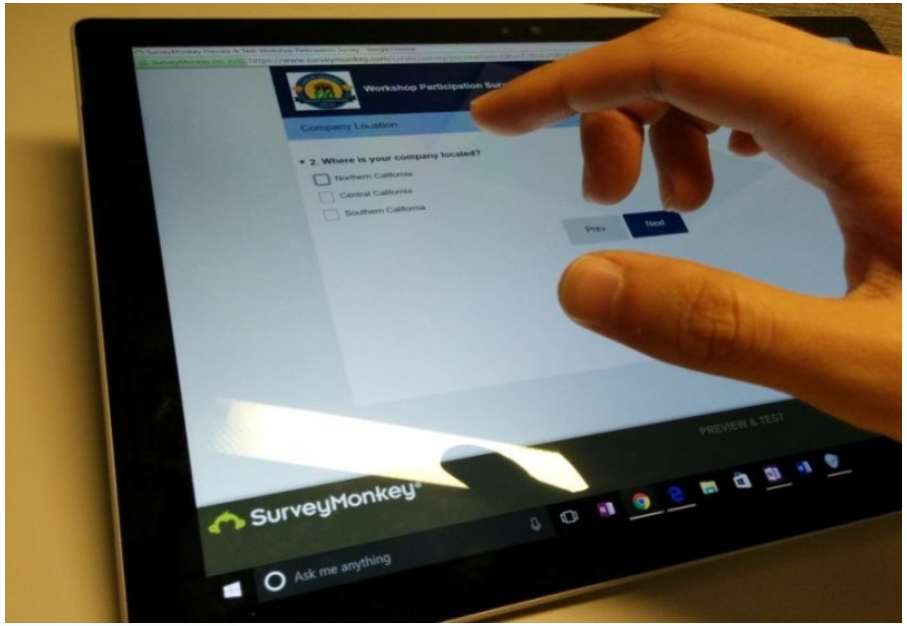
- Engage with disadvantaged and underrepresented groups throughout the state;
- Notify potential new applicants about the CEC's funding opportunities;
- Assist applicants to understand how to apply for funding from CEC's programs;
- Survey participants to measure progress in diversity outreach efforts

Diversity Survey

1 Minute Survey

The information supplied will be used for public reporting purposes to display anonymous overall attendance of diverse groups.

- Please use this link: https://forms.office.com/g/mcUfu6mkQs



Thanks!

Find a Partner on EmpowerInnovation.net

Empower Innovation strives to accelerate your clean tech journey with easy access to funding opportunities from the CEC and other funding providers, curated resources and events, and connections to people and organizations.

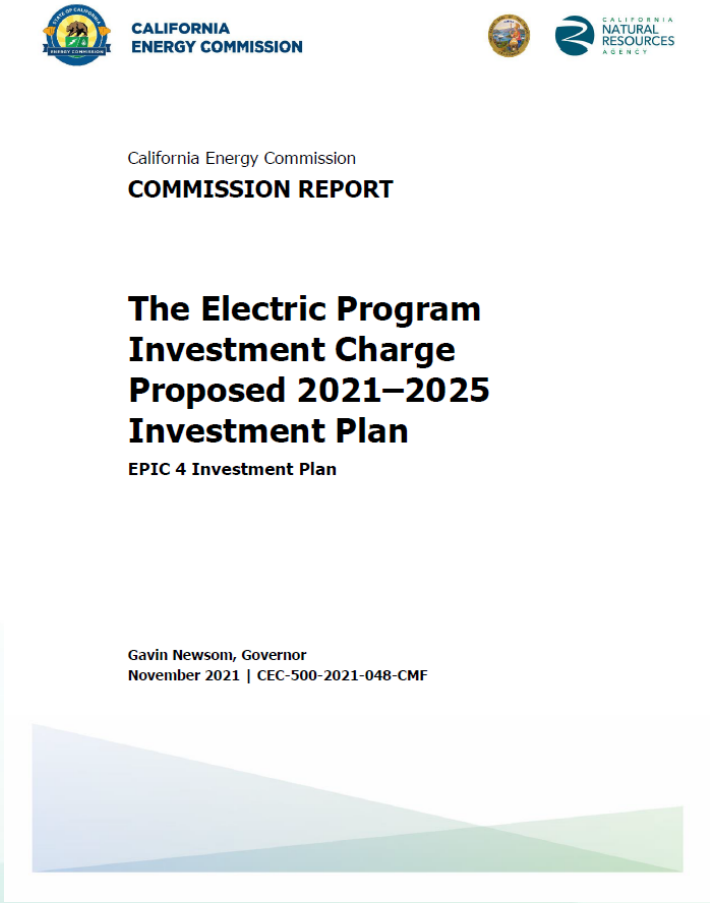
FIND A PARTNER	RESOURCES & TOOLS
Announce your interest in this funding opportunity and message other interested parties to find potential partners.	Browse the collection of resources for clean tech innovators including Resource Libraries, Funding Sources, Tools, and Databases.

Link to funding opportunities:
https://www.empowerinnovation.net/en/custom/funding/directory

For questions related to the Empower Innovation platform:
https://www.empowerinnovation.net/en/contact_us

EPIC Program Background

- Established by the CPUC in 2011 to fund research leading to technological breakthroughs supporting California's clean energy goals.
- Invests in pre-commercial technology innovation, complementing other state activities including standards, regulations, and incentives for commercial technology.
- ~$130 million annual budget, funded by an investor-owned utility electricity consumption surcharge.
- Provide electricity ratepayer benefits including improving safety, reliability, affordability, environmental sustainability, and equity.



Policy Drivers

- SB 100: Meet 100% of electricity retail sales and state agency electricity needs with renewable and zero-carbon resources by 2045.
- CEC Load Management Standards & MIDAS.
- SB 49: Standards for appliances to facilitate the deployment of flexible demand technologies.
- SB 846: Statewide demand flexibility goal of 7,000 megawatts (MW) by 2030.

Demand Flexibility Research at CEC

Kadir Bedir, Supervisor of Demand Flexibility Unit, CEC

VPPs and Demand Flexibility Research Scoping Workshop – 07/18/2023

Active Demand Flexibility R&D Projects (as of July 2023):

Dynamic Pricing/Management Communications & Controls
• California Flexible Load Research & Development Hub (LBNL)
Heat Pump Load Shifting (with TOU and GHG signals)
• Predictive Controls and Optimization for Residential Water Heating and Smart Thermostats (UC Davis)
• Central Heat Pump Water Heater Load Flexibility for Multi-Family Residential (Redwood Energy)
• Next Generation Heat Pump Load Flexibility for Commercial Space Heating & Cooling (LBNL)
• Harvest Thermal - Combined Water and Space Heating Systems for Residential Buildings (Franklin Energy)
Virtual Power Plants
• Deployment of Irrigation Pumping Demand Flexibility (Polaris Energy)
• Building Resiliency from Within (OhmConnect)

VPPs and DER – An Overview

- Virtual Power Plants (VPPs) are a portfolio of distributed energy resources (DER) such as smart thermostats, rooftop solar PV, EVs, batteries, and smart water heaters that are actively controlled to benefit the power system, consumers, and the environment.

- VPPs, as an emerging concept, is currently being used as an umbrella term by stakeholders for programs with one or more of the following characteristics:
  - Automated controls with dynamic communication,
  - metered/verified,
  - dispatchable,
  - market-integrated (resource adequacy or energy-only).

EPIC 4 Concept: Virtual Power Plant Approaches for Advancing Load Flexibility ("VPP-FLEX")

Background (Investment Plan Initiative #18):

- Advance new monitoring and control solutions for managing customer loads and DER operations in response to grid signals and wholesale market participation.
- Create standard approaches to reduce adoption costs and facilitate VPP adoption.

Possible Project Focus:

- Automated load shifting demonstrations with user interface and emergency load shed capabilities
- The use of AMI data analytics for identifying VPP/DF resources
- Community-owned resource approaches with local partners
- VPPs as a long-term resource (5-10 years) with cost recovery goals

EPIC 4 Investment Plan (hyperlink):

VPP-FLEX Concept Questions and Feedback

- How can **community-owned VPPs** be effective in shifting load and providing grid benefits?
- What are the **technical and market barriers** to implementing VPP programs, and your suggestions for overcoming these barriers?
- How can load shifting programs be expanded to **increase customer participation** and provide grid benefits?
- What **performance metrics** should be used to measure the technical and economic effectiveness of a VPP program?
- What are common practices for **energy measurement and verification?**
- How can this concept be timed and coordinated with **other funding opportunities?** (e.g., U.S. DOE's Title17 Clean Energy Financing)

Next Steps

Written Comments to Docket # 23-ERDD-01: https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=23-ERDD-01

Deadline to submit comments: August 1, 2023, by 5:00 pm

Will consider all comments as we develop our solicitations

PANEL-1: VPP Technology Provider Perspectives
Moderator: Eric Ritter, CEC

- Farshid Arman, **AutoGrid**
- David Meyers, **Polaris**
- Samuel Goda, **Kaluza**
- Carmen Best, **Recurve**
- Joseph Vellone, **ev.energy**

BREAK 10-Minutes

PANEL-2: Load Serving Entity Perspectives
Moderator: Erik Lyon, CEC

- **Clean Power Alliance**
  - Joanne O'Neill
- **Sonoma Clean Power**
  - Rebecca Simonson & Kimberly Beltran
- **Valley Clean Energy**
  - Mitch Sears
- **East Bay Community Energy**
  - Brett Wiley
- **Marin Clean Energy**
  - Melanie Biesecker

Next Steps