

**DOCKETED**

<b>Docket Number:</b>	23-BUSMTG-01
<b>Project Title:</b>	Business Meeting Agendas, Transcripts, Minutes, and Public Comments
<b>TN #:</b>	249607
<b>Document Title:</b>	Presentation - Item 06 - Electric Program Investment Charge (EPIC) 2022 Annual Report 2022
<b>Description:</b>	Item 06 presentation slides for CEC Business Meeting on April 12, 2023.
<b>Filer:</b>	Fritz Foo
<b>Organization:</b>	California Energy Commission
<b>Submitter Role:</b>	Commission Staff
<b>Submission Date:</b>	4/10/2023 4:58:02 PM
<b>Docketed Date:</b>	4/10/2023



# **Item 6: Electric Program Investment Charge (EPIC) 2022 Annual Report**

April 12, 2023

Fritz Foo, Supervisor  
Strategic Analysis and Engagement Branch  
Energy Research and Development Division



# EPIC by the Numbers

**~\$1.13B**  
EPIC FUNDS INVESTED

**70+**  
TECHNOLOGIES COMMERCIALIZED

**\$10.5B**  
PRIVATE INVESTMENT  
AFTER RECEIVING EPIC  
SUPPORT

**21%**  
AVERAGE EMPLOYMENT  
GROWTH AFTER RECEIVING  
EPIC SUPPORT

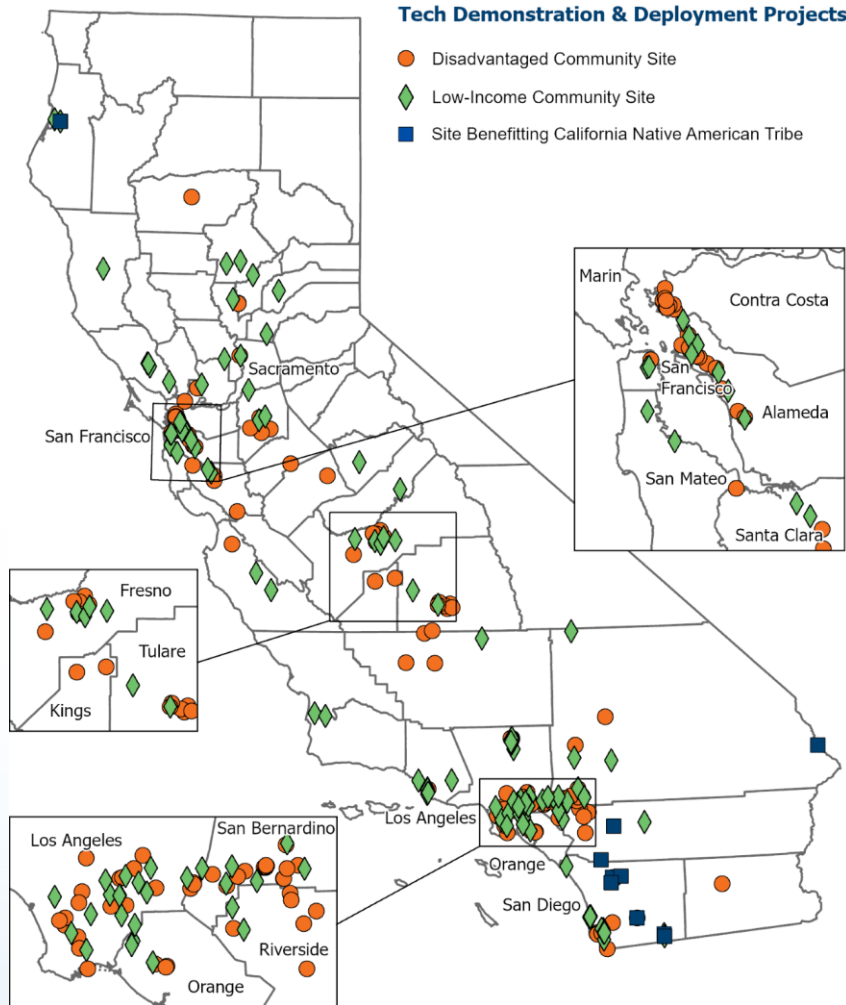


# EPIC Project Investments To Date

- \$236M** CLEAN ENERGY ENTREPRENEURIAL ECOSYSTEM
- \$195M** RESILIENCY AND SAFETY
- \$249M** BUILDING DECARBONIZATION
- \$223M** GRID DECARBONIZATION AND DECENTRALIZATION
- \$119M** INDUSTRIAL AND AGRICULTURAL INNOVATION
- \$86M** ZERO-EMISSION TRANSPORTATION



# EPIC Demonstration Projects in Under-Resourced Communities



## EPIC Technology Demonstration and Deployment Funding:

- **70%+** in under-resourced communities
- **\$22M** in California Native American tribes

Map of EPIC Technology Demonstration and Deployment Projects in Disadvantaged or Low-Income areas.

Source: California Energy Commission



# EPIC Delivering Real World Benefits

The EPIC-funded microgrid at the Blue Lake Rancheria casino provided critical support following an earthquake on December 20, 2022.



Source: The Sacramento Bee



# 2022 EPIC Highlights

Increasing Resilience and Reliability Amidst a Changing Climate



San Francisco Bay Bridge during August 2020 Heat Storm

Source: Reuters

Building a Circular Economy for Next-Generation Battery Technologies



Green Batteries and a Circular Economy (artist rendering)

Source: European Portable Battery Association

Enabling the Electrification of Everything



Electrified Economy (artist rendering)

Source: GreenBiz



# The Miramar Microgrid Supporting Our Military and Our Grid

- **16:** Number of times Miramar's microgrid supported the grid since coming online in 2020
- **10+** Number of full, base-wide island events coming from black start or full-base outage tests since debut
- **6MW:** Amount of capacity Miramar has to respond to a single demand response event



A United States Marine walks by solar panels at MCAS Miramar  
Source: US Marine Corps





# Pyregence

## Preventing Wildfires Through Big Data



Firefighter at the 2021 California Monument Fire.

Source: USDA

- **7:** Days that can be forecasted out for active fires—compared to industry standard of 4 days
- **4x/day:** Frequency of updates to the PyreCast 5-day fire weather forecast
- **20,000+:** PyreCast users during fire season
- **\$0:** Cost to users—including fire risk managers, utility companies, and concerned residents



# South 8 Technologies

## Increasing the Safety and Affordability of Lithium-ion Batteries

- **30%:** Reduction in battery costs using LiGas® electrolyte
- **15 minutes:** Average South 8 battery fast-charge time
- **-20° to 60° Celsius:** Safe temperature range for Li-ion batteries using traditional electrolytes
- **-60° to 60° Celsius:** Safe temperature range for Li-ion batteries with LiGas®
- **35%:** Increase in Li-ion battery energy density with LiGas®



Deputy Secretary of the U.S. Department of Energy David Turk with the co-founders of South 8.  
Source: South 8 Technologies



# Smartville, Inc.

## Giving EV Batteries a Second Life Powering California



Smartville MOAB™ Energy Storage System, powered by repurposed EV battery packs and charged by a UC San Diego solar energy array

Source: The San Diego Union-Tribune

- **15,000 MW:** Storage capacity that needs to come online in California by 2032
- **100 MWh:** Smartville manufacturing production capacity planned by 2025—a 10x scale-up
- **48+:** Hours of back-up power in pilot test at UC San Diego
- **4 MWh:** Total planned capacity at Wellhead Electric—a San Joaquin Peaker Plant



# Gradient

## Making Building Electrification Accessible for All

- **95%:** Reduction in GHG emissions with Gradient heat pump
- **\$5,000:** Installation cost savings for Gradient heat pump, compared to conventional technology
- **30-60 minutes:** Average customer installation time for Gradient heat pump
- **33% and 70%:** Increase in efficiency provided by Gradient's modular heat pump for cooling and heating, respectively



Gradient fits below the windowsill, allowing for a better view than traditional in-window AC units.

Source: Gradient



# Twelve Electrifying Chemical Manufacturing



Etosha Cave, co-founder and Chief Scientific Officer of Twelve, holding the company's reactor.

Source: Twelve

- **50%:** Amount of industrial emissions that can be reduced by replacing fossil feedstocks through Twelve's technology
- **5+:** Number of major corporations who have officially partnered with Twelve—including Shopify, Alaska Airlines, and Microsoft
- **4:** Number of employees at time of CalSEED award in 2016.
- **275:** Number of planned employees by 2023 .



# Looking Ahead EPIC Opportunities in 2023

## Priority investments planned for 2023 include:

- Advanced prefabricated zero-carbon homes
- Improved valuation of investments in grid resilience
- Emerging non-lithium long-duration energy storage technologies
- Renewable hydrogen
- Novel lithium-ion battery recycling and reuse processes
- Decarbonizing industrial sector
- New designs for floating offshore wind mooring lines and anchors and environmental monitoring technologies



# Staff Recommendation

---

- Approve *2022 EPIC Annual Report*
- Report will be submitted to the Legislature and the CPUC on April 28