Accelerating Adoption of DERs through Incentive and Demonstration Programs

Grid Evolution or Revolution? Accelerating Building Electrification, Demand Flexibility and Distributed Energy Resources

National Association of State Energy Officials (NASEO) 2022 Annual Meeting

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Center for Sustainable Energy®

One mission —

DECARBONIZE.

- CSE administers cutting-edge incentive programs valued at over $4 billion for governments, utilities and the private sector across the U.S.

- Leader in data-driven incentive program design and administration for:
  - Electric Vehicle and EV charging incentive programs
  - Renewable energy incentive programs (solar and storage)

- Headquartered in San Diego with more than 250 employees in 34 states

Center for Sustainable Energy®

Caret®

Mission-driven 501(c)(3) nonprofit

California Climate Goals

Senate Bill 32

Expands Assembly Bill 32, Global Warming Solutions Act of 2006, and sets goal to reduce greenhouse gas emissions to 40% 1990 level by 2030

Senate Bill 100

100% clean electricity, renewable and zero-carbon energy, by 2045

Reducing Stress on the Grid

Energy Efficiency

Per California “loading order”, pursue cost-effective efficiency strategies to reduce energy loads

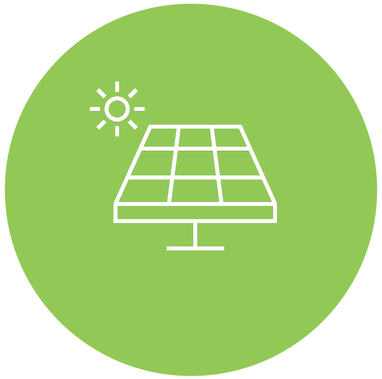
Distributed Energy Resources (DER)

Deploy combinations of technologies such as solar and storage behind the meter to lower energy demands on the grid

Load Flexibility

Implement demand response programs and load shedding measures to reduce loads at peak times

DER Incentive Programs CSE Administers



Solar on Multifamily Affordable Housing (SOMAH)

$1 billion-dollar, statewide solar incentive program targeting multifamily residences located in disadvantaged communities with a focus on job training and community engagement

Self-Generation Incentive Program (SGIP)

$830 million-dollar, statewide incentive program providing financial incentives for the installation of clean, efficient and cutting-edge generation and storage technologies

San Diego Solar Equity Program

$10 million-dollar incentive program for income-qualifying, City of San Diego homeowners located in Communities of Concern

An “EPIC” Case Study

Aren’t All Microgrid Projects EPIC?

- The Electric Program Investment Charge (EPIC) Program is a California Energy Commission (CEC) program to meet state climate goals and encourage the development and commercialization of new, clean energy solutions
- Established in 2012 and funded by three investor-owned utilities: Pacific Gas & Electric (PG&E), Southern California Edison (SCE) and San Diego Gas and Electric (SDG&E)
- EPIC funding invests more than $130M per year for research and demonstration projects on a variety of clean energy topics

Top 20 Most Destructive California Wildfires

	FIRE NAME *(CAUSE)*	DATE	COUNTY	ACRES	*STRUCTURES*	DEATHS
1	**CAMP** *(Powerlines)*	November 2018	Butte	153,336	**18,804**	85
2	**TUBBS** *(Electrical)*	October 2017	Napa & Sonoma	36,807	**5,636**	22
3	**TUNNEL - Oakland Hills** *(Rekindle)*	October 1991	Alameda	1,600	**2,900**	25
4	**CEDAR** *(Human Related)*	October 2003	San Diego	273,246	**2,820**	15
5	**NORTH COMPLEX** *(Lightning)*	August, 2020	Butte, Plumas, & Yuba	318,935	**2,352**	15
6	**VALLEY** *(Electrical)*	September 2015	Lake, Napa & Sonoma	76,067	**1,955**	4
7	**WITCH** *(Powerlines)*	October 2007	San Diego	197,990	**1,650**	2
8	**WOOLSEY** *(Electrical)*	November 2018	Ventura	96,949	**1,643**	3
9	**CARR** *(Human Related)*	July 2018	Shasta County, Trinity	229,651	**1,614**	8
10	**GLASS** *(Undetermined)*	September 2020	Napa & Sonoma	67,484	**1,520**	0
11	**LNU LIGHTNING COMPLEX** *(Lightning/Arson)*	August 2020	Napa, Solano, Sonoma, Yolo, Lake, & Colusa	363,220	**1,491**	6
12	**CZU LIGHTNING COMPLEX** *(Lightning)*	August 2020	Santa Cruz, San Mateo	86,509	**1,490**	1
13	**NUNS** *(Powerline)*	October 2017	Sonoma	54,382	**1,355**	3
14	**DIXIE** *(Under Investigation)**	July 2021	Butte, Plumas, Lassen, & Tehama	963,309	**1,329**	1
15	**THOMAS** *(Powerline)*	December 2017	Ventura & Santa Barbara	281,893	**1,063**	2
16	**CALDOR***(Human Related)*	September 2021	Alpine, Amador, & El Dorado	221,835	**1,003**	1
17	**OLD** *(Human Related)*	October 2003	San Bernardino	91,281	**1,003**	6
18	**JONES** *(Undetermined)*	October 1999	Shasta	26,200	**954**	1
19	**AUGUST COMPLEX** *(Lightning)*	August 2020	Mendocino, Humboldt, Trinity, Tehama, Glenn, Lake, & Colusa	1,032,648	**935**	1
20	**BUTTE** *(Powerlines)*	September 2015	Amador & Calaveras	70,868	**921**	2

"Structures" include homes, outbuildings (barns, garages, sheds, etc) and commercial properties destroyed.
This list does not include fire jurisdiction. These are the Top 20 regardless of whether they were state, federal, or local responsibility.
*Numbers not final

1/13/2022

Obtained from Cal Fire Website on 8/18/2022

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SANTA ROSA JUNIOR COLLEGE

Prime Grant Recipient
Site Host

Center for Sustainable Energy®

Project Management
CEC Reporting

PXiSE Energy Solutions

Microgrid Controller
Project Design

Worley
energy | chemicals | resources

Electrical Engineering
Modelling

Go Electric
A Saft company

Energport

IEM.

Technology Providers

Microgrid Components

Solar Photovoltaic (PV) Generation

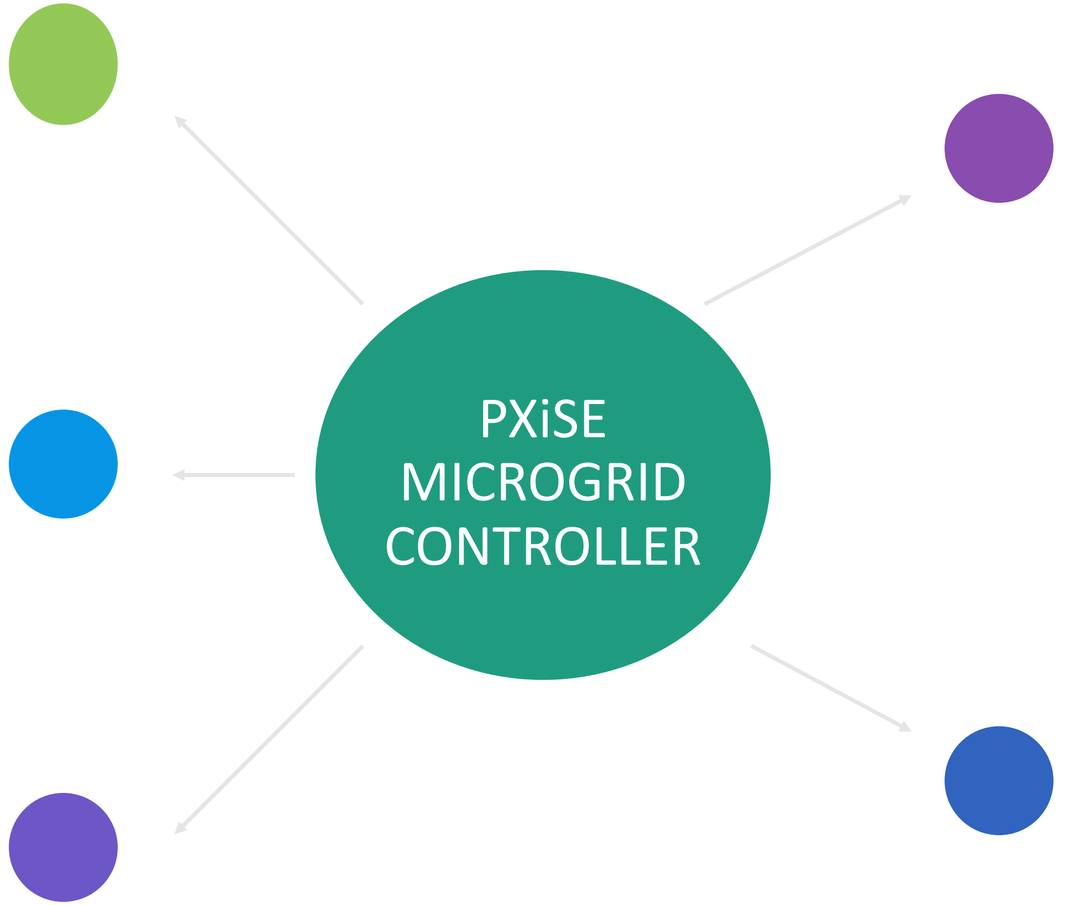
2.3 MW of solar capacity across four PV systems

Battery Energy Storage Systems (BESS)

Twp 1MW/1MWh lithium iron phosphate “power” batteries and one 1MW/2MWh lithium ion “energy” battery

Demand Side Management

Loadshedding devices installed at each building to allow for building livel load flexibility



Advanced Metering

High-accuracy Acuvim power meters at each building to provide real-time data on building energy consumption

Automatic Demand Response

Updating the global, campus-wide energy management system and adding OpenADR software to allow participation in utility demand response programs

Performance Objectives

Environmental

Support 40% of campus electricity use with solar and offset the use of diesel back-up generators in an outage

Resiliency

Island through a planned or unplanned grid outage without disrupting campus activities and load shed as needed to support critical loads for longer duration outages

Economic

Reduce peak demand charges and tap into value stream of demand response programs

Energy Efficiency

Collective energy efficiency projects such as LED lighting retrofits and electrification of space heating and cooling are expected to reduce campus load by 15%


DANGER
HIGH
VOLTAGE
KEEP OUT

Lessons Learned

1

Factoring in Value of Resiliency

Public agencies face a tradeoff between resiliency and return on investment of a microgrid project.

2

Plan Early for Interconnection

Work with the local utility to plan on how the microgrid system can become a grid asset and understand utility interconnection pathways for behind-the-meter generation and storage assets.

3

Stack Resiliency DR Programs

Emergency load reduction programs should not only be economically competitive but also stackable with existing demand response programs to encourage enrollment

4

Testing is Disruptive

Be aware that testing microgrid operation on existing buildings will require extensive shutdowns which requires ongoing communication with building occupants and identification of loads that cannot lose power.

5

Funding is Needed for Community Resilience Planning

EPIC grand funding was crucial and grant or direct funding opportunities will play a key role in overcoming the financial barrier for public institutions to pursue microgrid projects.

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