Microgrids for a Resilient, Renewable Future

Webinar – August 13, 2025

nbi new buildings institute

1

SAN DIEGO LEARN

This webinar was developed in partnership with the LEARN Program.

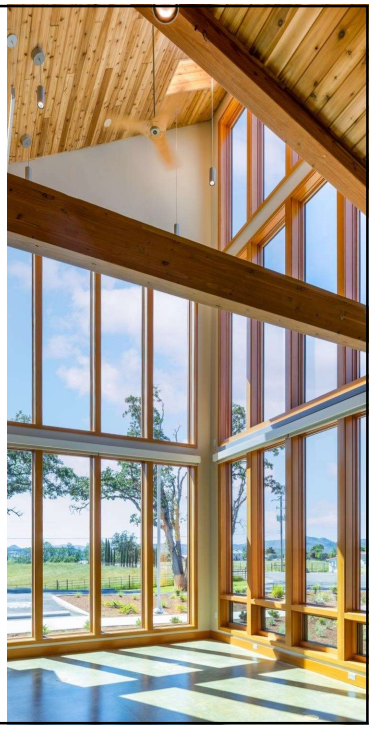
The LEARN Program is a San Diego-based workforce education and training program that has partnered with New Buildings Institute to offer free energy efficiency and electrification webinars. Please visit the LEARN website for more information: www.sandiegolearn.com

nbi new buildings institute

2

Energy Trust New Buildings Program

- **Incentives s support**
  - Commercial new construction and major renovation projects from early design through post-construction
- **Trainings s events**
  - In-person events, live webinars and on-demand trainings
- **Net Zero grants**
  - **Net Zero Fellowship** – Research that advances net-zero design and technologies and addresses barriers
  - **Net Zero Emerging Leaders Internship (NZELI)** – Internship funding for architecture and engineering firms to support their carbon commitments



For more information:

Kriya Kaping
Market and training manager
kriya.kaping@clearesult.com

EnergyTrust of Oregon

energytrust.org/commercial/newbuildings/education/training-and-events/

3

Microgrids for a Resilient, Renewable Future

In today's webinar we'll discuss:

- How and why of microgrids
- Why are utilities interested in microgrids?
- Microgrid case studies and examples
- How do we make microgrids easier to design and build

2

4

Today's Panelists

Ramakrishna (Ram) Dhanekula

San Diego Gas & Electric

Karina Hershberg

PAE

5

Questions?

Thank you for your interest and joining us today!

nbi new buildings institute

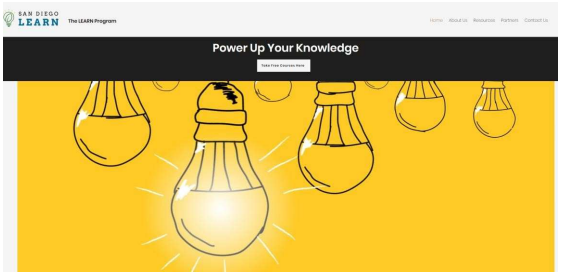
www.newbuildings.org

3

6

Share your feedback in this short survey

Power up your electrification knowledge with the San Diego LEARN program: www.sandiegolearn.com



nbi new buildings institute

www.newbuildings.org

7

SDGE™

SDG&E Microgrids

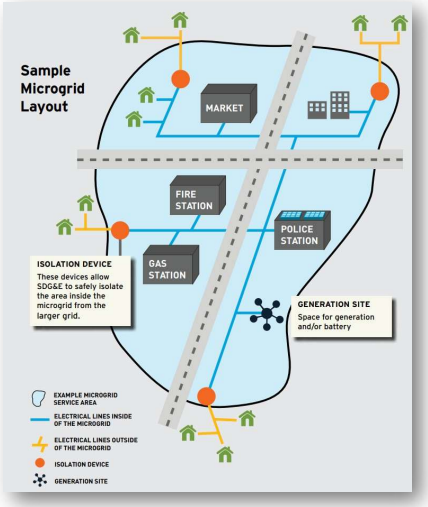
Ram Dhanekula

Technology Strategy Architect

8

Microgrid Background

- Microgrids are a localized energy system that can operate independently or in parallel with the main power grid, integrating various energy sources like solar, wind, batteries, and generators to serve load
- Increase reliability and resiliency for critical public facilities in communities that are at higher risk of electrical outages
- Typical microgrids include Distributed Energy Resources (DERs), energy storage systems, control systems, optional Demand Response (DR) technologies
- Microgrids are used in diverse settings such as military bases, hospitals, universities, remote communities, and disaster-prone regions to ensure continuous and efficient power supply
- Microgrid operate in two modes
  - **Island Mode** – During an outage, microgrid disconnects from the larger grid and remains energized
  - **Blue Sky Mode** – When the larger electric grid is functioning under normal conditions, the resources within the microgrid boundary can generate and store energy in parallel to the grid and participate in regional energy markets



SDGE

9

9

SDG&E Utility-Owned Energy Storage Portfolio

SDGE

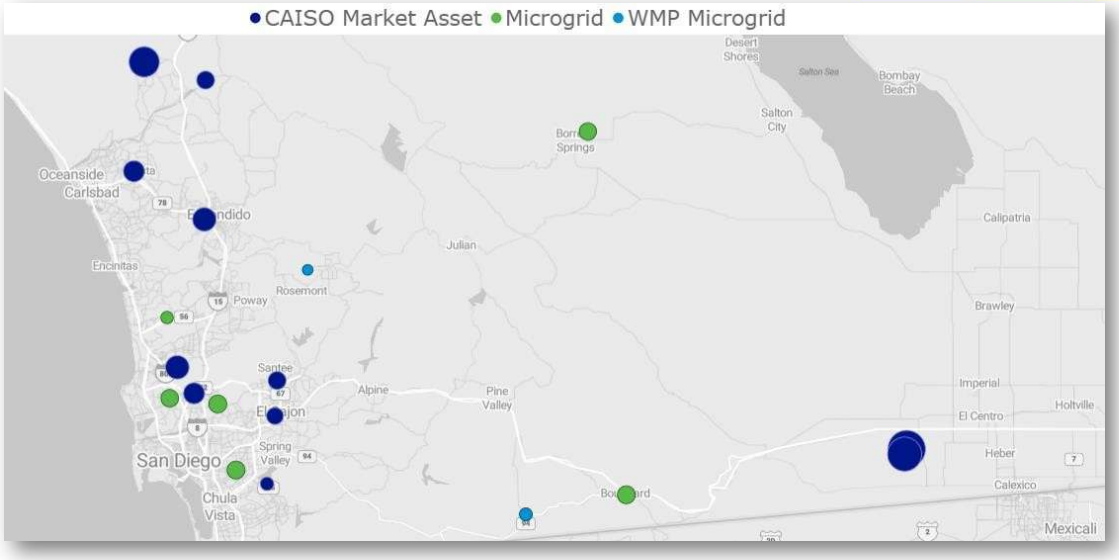
Project/Location	MW / MWh	COD	Use Case
In-Service SDG&E Energy Storage Projects (335 MW)			
Pala, Canyon Crest, Ortega Hwy, Borrego Springs	5 MW / 11 MWh	2012-2015	Reliability, PV smoothing, Load management, Microgrid
Escondido	30 MW / 120 MWh	2017	CAISO wholesale
El Cajon	7.5 MW / 30 MWh	2017	
Miguel VRF	2 MW / 8 MWh	2017	PV smoothing, Load management, CAISO wholesale
Miramar Top Gun	30 MW / 120 MWh	2021	CAISO wholesale
Kearny	20 MW / 80 MWh	2022	
Ramona Air Attack	0.5 MW/ 2 MWh	2022	Microgrid/Resiliency, CAISO wholesale
Fallbrook 1.0	40 MW / 160 MWh	2023	CAISO wholesale
Westside Canal 1	131 MW / 524 MWh	2024	
Melrose 1 & 2	20 MW / 80 MWh	2024	
Pala Gomez-Creek	10 MW / 60 MWh	2024	
Boulevard	10 MW / 50.5 MWh	2024	Microgrid/Resiliency, CAISO wholesale
Clairemont	9 MW / 29 MWh	2024	
Elliot	10 MW / 50.5 MWh	2024	
Paradise	10 MW / 50.5 MWh	2024	
Westside Canal 2B	100 MW / 400 MWh	2025	CAISO wholesale
In-Development / Construction SDG&E Energy Storage Projects (49.2 MW)			
Cameron Corners, Butterfield, Shelter Valley, Wueste Rd.	2.2 MW / 12 MWh	2024-2028	Microgrid/Resiliency, CAISO wholesale
Borrego Microgrid Expansion	7 MW / 14 MWh	2025	Reliability, PV smoothing, Load management, Microgrid
Fallbrook 2.0	30 MW / 120 MWh	2025	Reliability
Santee	10 MW / 40 MWh	2025	
Total	**~484.2 MW / 1,961.5 MWh**		

10

5

10

Locally Utility-Owned Energy Storage & Microgrids

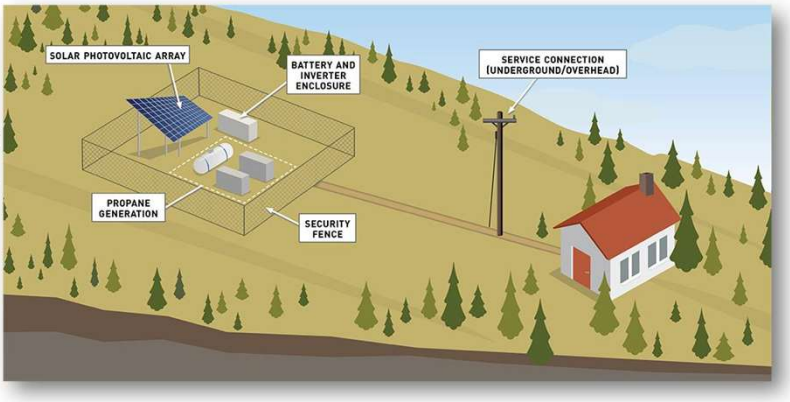


Ramona Air Attack Base Microgrid

- Home to CAL FIRE and U.S. Forest Service's aerial fighting assets
- Used during PSPS events and emergencies
- All other times this asset serves the CAISO market
- Site is powered by a 500 kW/ 2,000-kWh battery system

Remote Microgrids

- Use a standalone power system to provide power to customers in less-populated, high-fire threat areas
- Offer independence from the larger electric grid
- Combine solar power, batteries and fuel-powered generators to provide customers with safe, clean, continuous electric service
- Remote grids help with –
  - Reduce wildfire risk by removing electric poles and overhead powerlines
  - Provide safe and reliable electric service
  - Reduce service gaps during winter weather or PSPS



SDGE

Microgrid Incentive Program (MIP) Objective

Adopted Staff Proposal Objectives: *"To fund **customer owned, multi-property clean community microgrids** that support the critical needs of vulnerable populations most likely to be impacted by grid outages."*

- Increase reliability and resiliency for critical public facilities in communities that are at higher risk of electrical outages
- Prioritize communities with higher proportions of low-income, access and functional needs, and electricity dependent residents
- Enable communities with lower ability to fund development of backup generation to maintain critical loads during outages
- Provides opportunity to mature new technologies or regulatory approaches to inform future action to the benefit of all ratepayers

Program Funding by IOU

UTILITY	TOTAL BUDGET*
PG&E	$87.2M
SCE	$91.34M
SDG&E	$21.46M
TOTAL	**$200M**

*Includes utility program and administrative costs

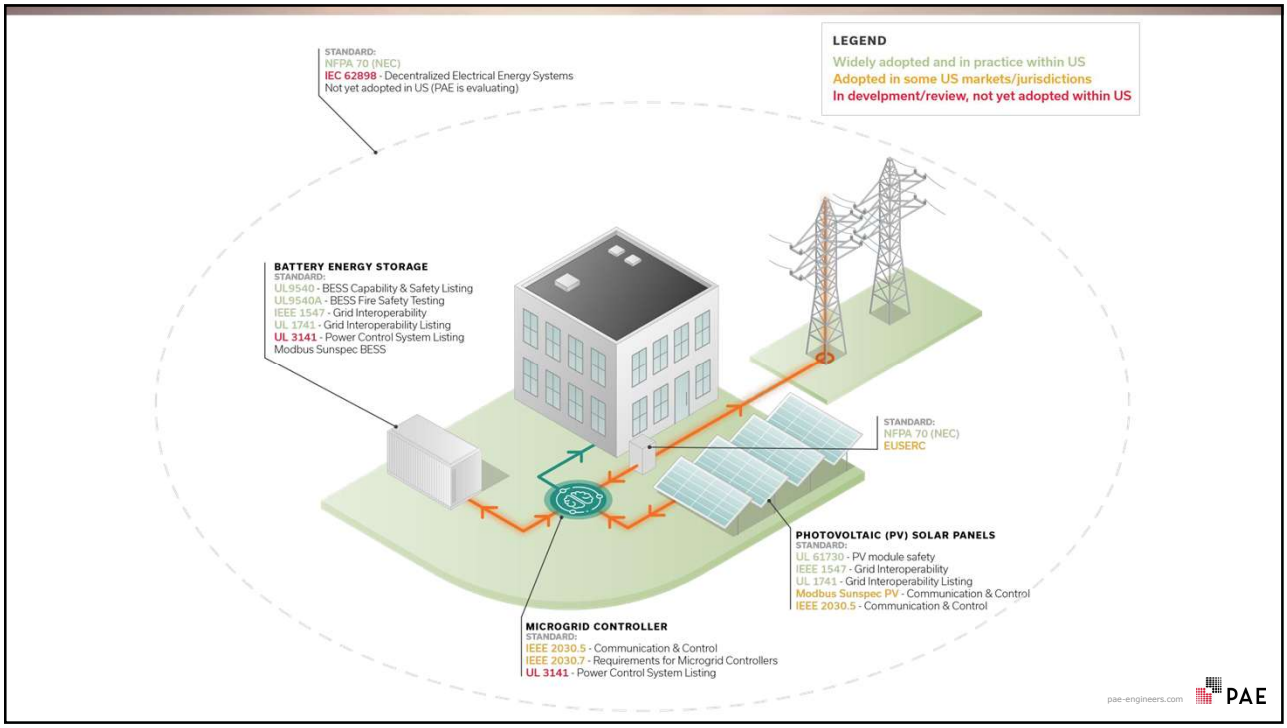
SDGE

Microgrids for a Resilient Renewable Future

KARINA HERSHBERG

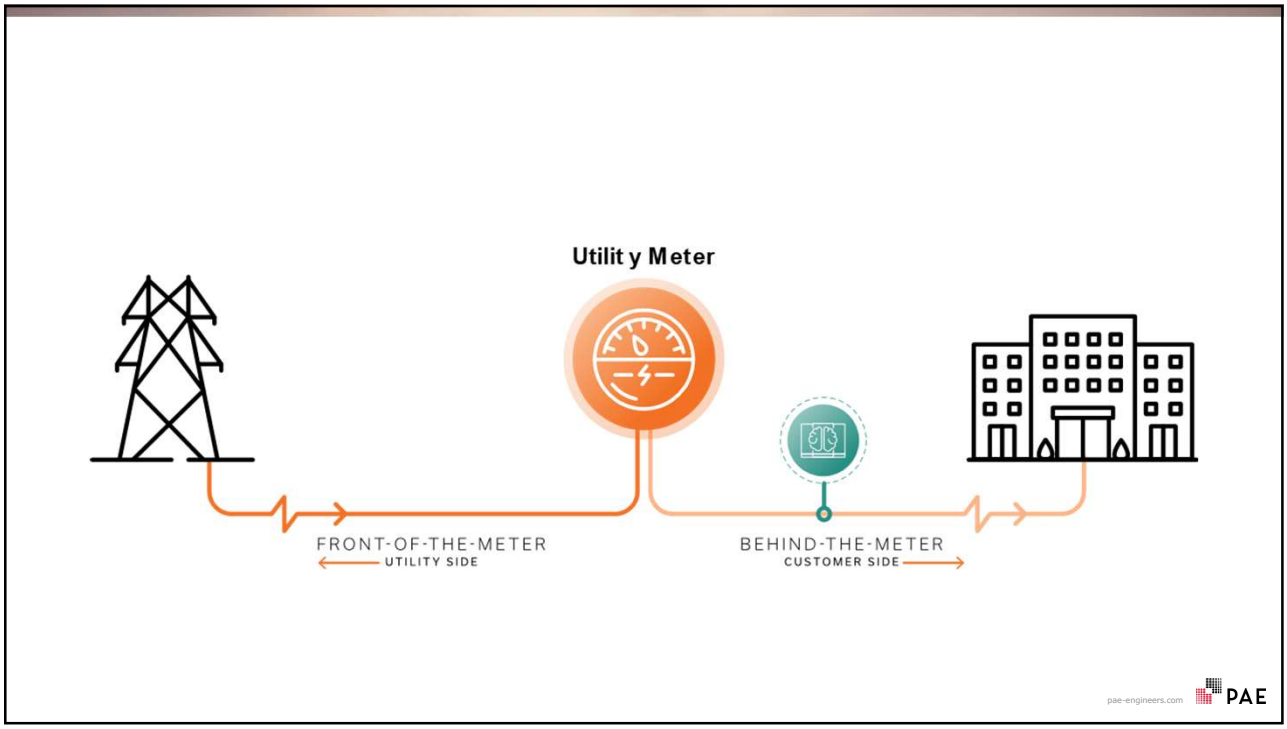
PAE

15

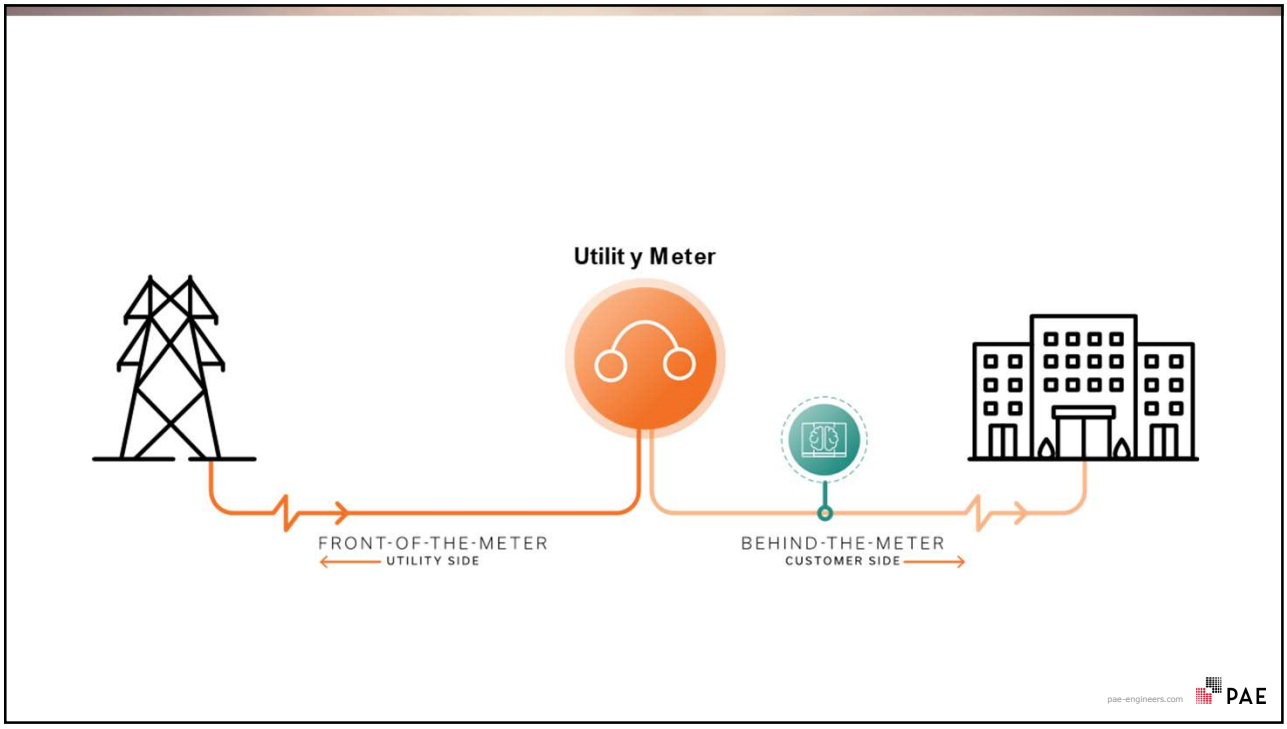


8

16

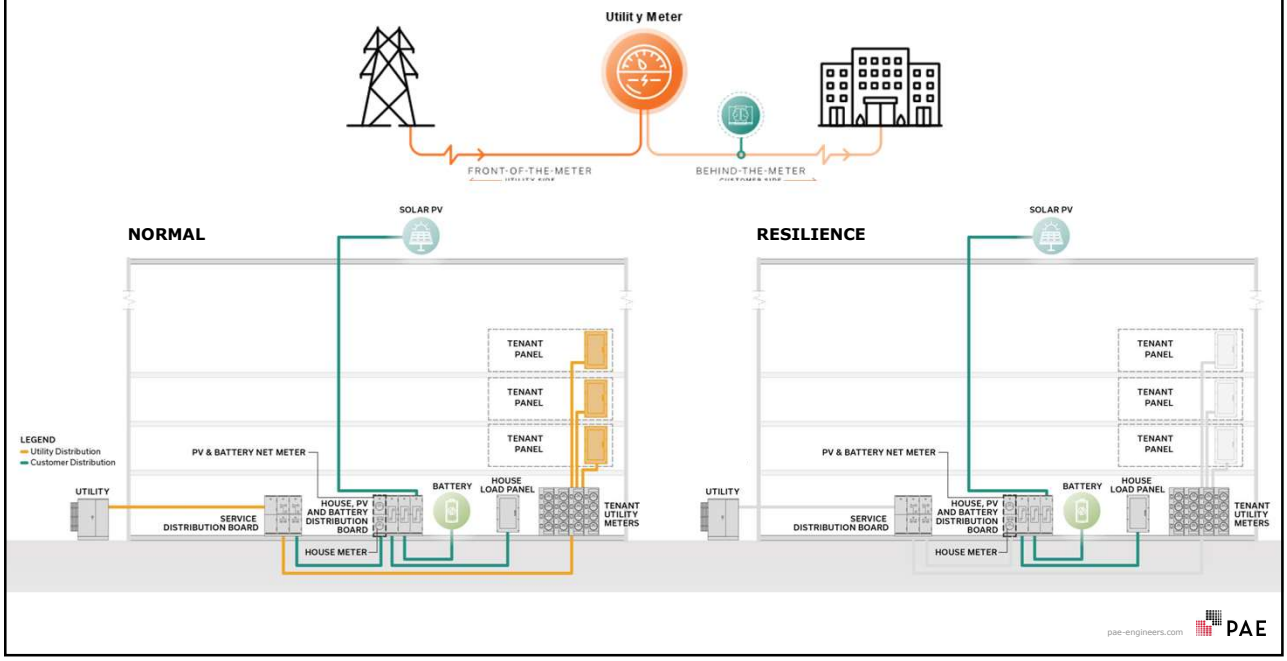

Utility Meter
FRONT-OF-THE-METER
UTILITY SIDE
BEHIND-THE-METER
CUSTOMER SIDE
pae-engineers.com
PAE

17


Utility Meter
FRONT-OF-THE-METER
UTILITY SIDE
BEHIND-THE-METER
CUSTOMER SIDE
pae-engineers.com
PAE

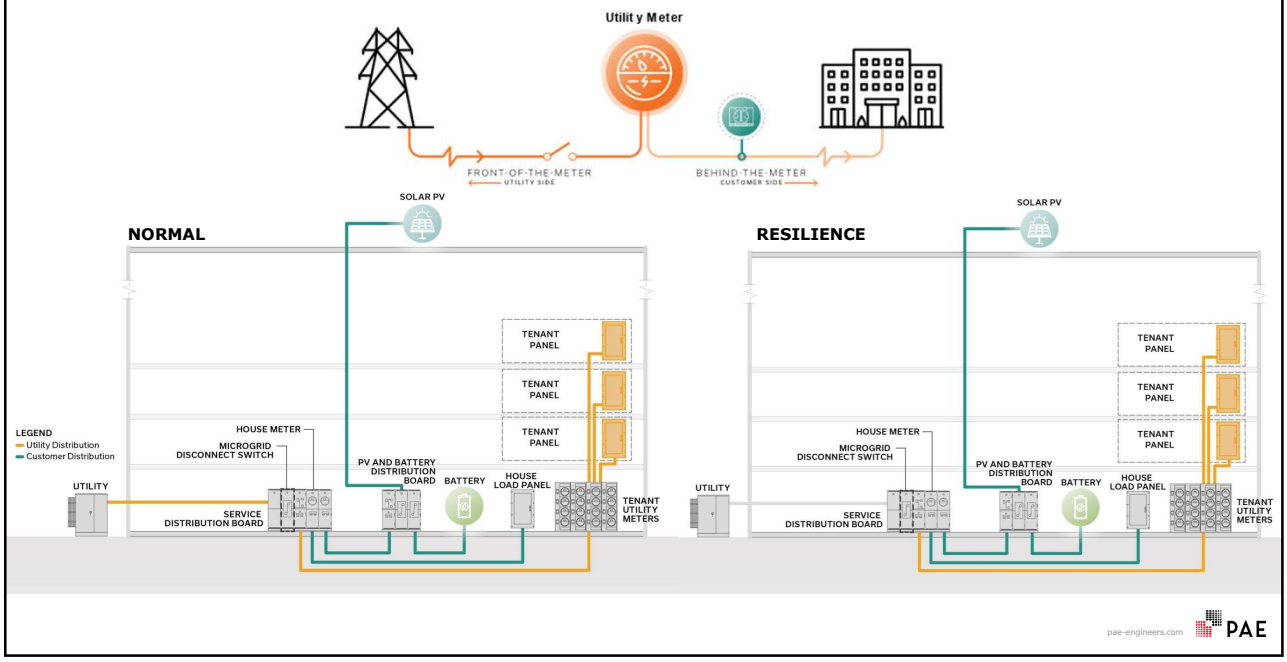
18

CURRENT | HOUSE METER ONLY

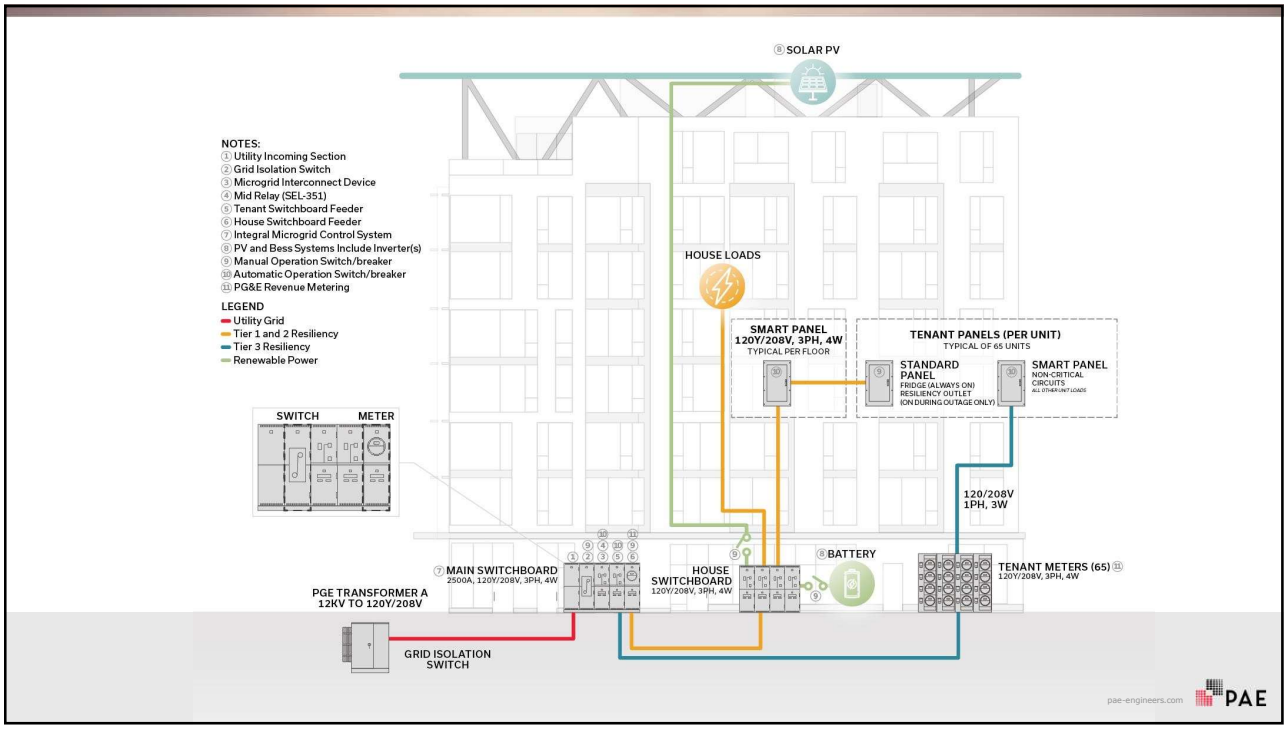


19

FUTURE | WHOLE BUILDING WITH MULTI-METER



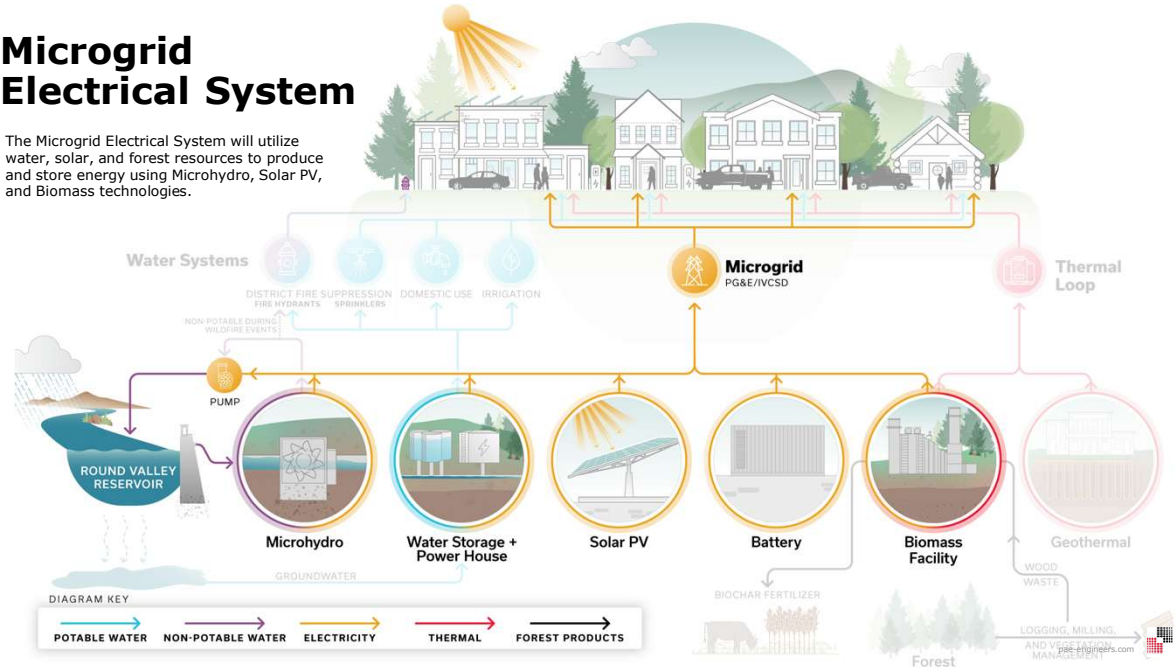
20



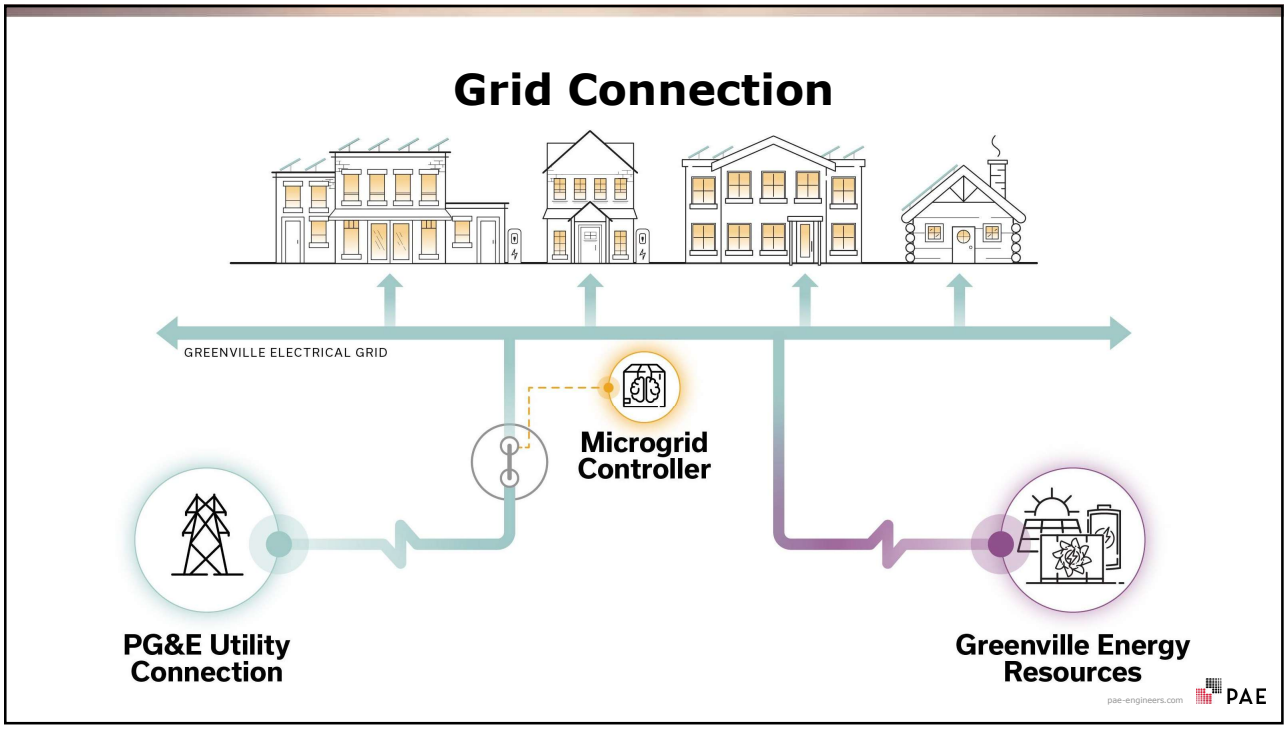
21

Microgrid Electrical System

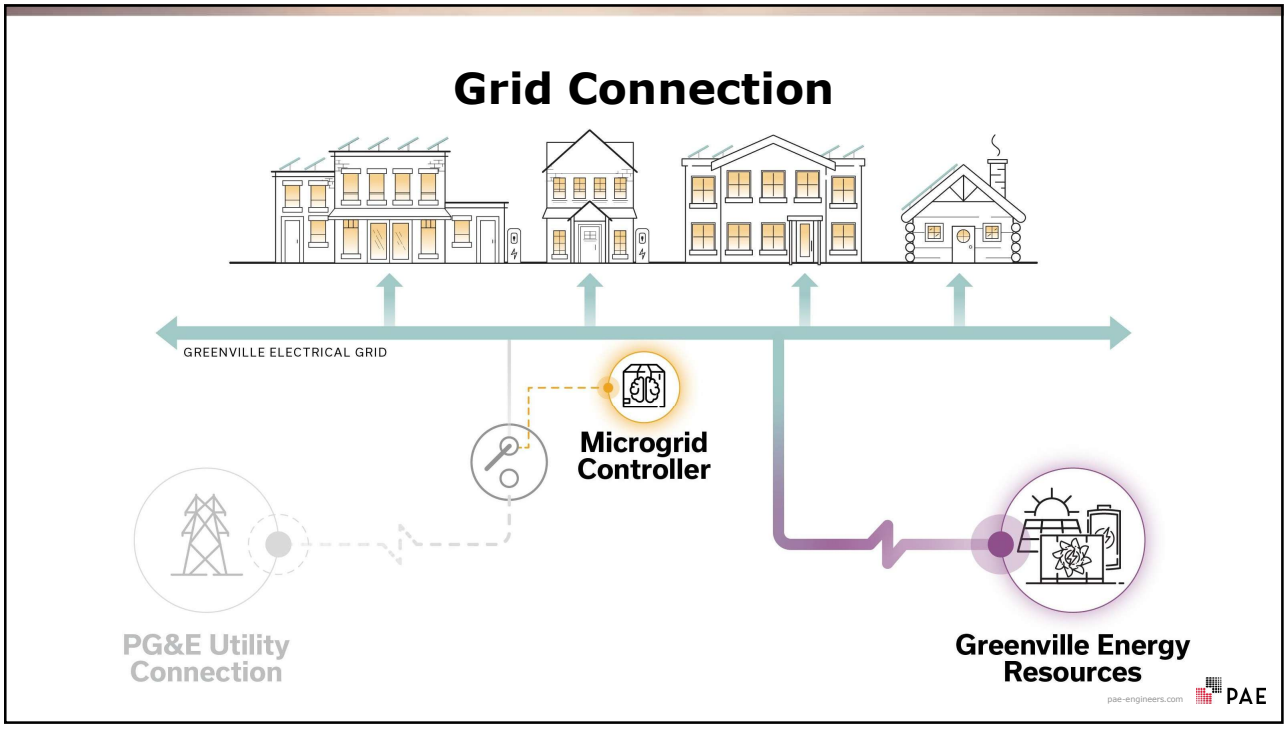
The Microgrid Electrical System will utilize water, solar, and forest resources to produce and store energy using Microhydro, Solar PV, and Biomass technologies.



22


Grid Connection
GREENVILLE ELECTRICAL GRID
Microgrid Controller
PG&E Utility Connection
Greenville Energy Resources
pae-engineers.com
PAE

23


Grid Connection
GREENVILLE ELECTRICAL GRID
Microgrid Controller
PG&E Utility Connection
Greenville Energy Resources
pae-engineers.com
PAE

24

Supporting Communities

GOLDENDALE DISTRICT MICROGRID

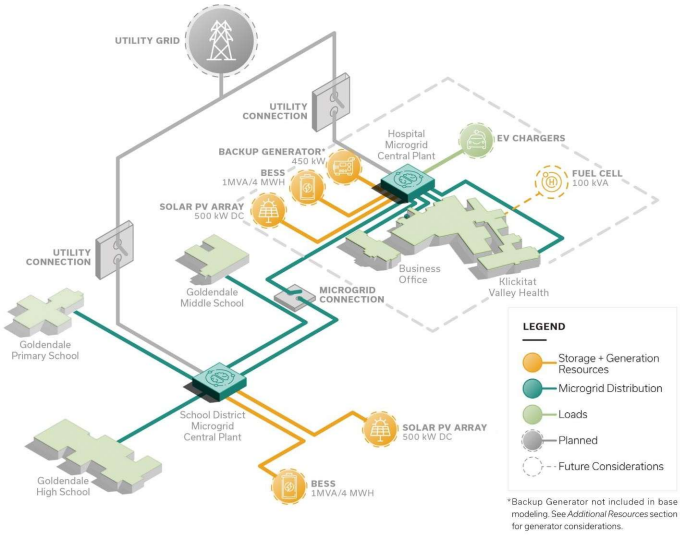
The Goldendale District Microgrid was designed to provide a district-scale microgrid in Goldendale, WA. The system would utilize solar photovoltaic (PV) and a battery energy storage system (BESS) to create a microgrid for energy resilience and operating cost reductions. The entries served by microgrid are the Goldendale School District and Klickitat Valley Hospital.

KEY BENEFITS

Reduced operating costs for the hospital and school district due to reduced grid-power consumption and peak power requirements from the PV and battery systems

Microgrid can support critical building loads during grid outages.

- During times of high solar production, the systems can power critical building loads for more than 3 days before the generators are needed.



*Backup Generator not included in base modeling. See *Additional Resources* section for generator considerations.

Normal Operation
CONNECTED TO GRID

During normal operation, the system will help reduce operating costs for the connected buildings and local power company. Operating cost savings are achieved from reduced utility consumption (PV array) and reduced demand charges (PV and BESS). Annual operational savings is projected to be $95,000.

Resilient Operation
DISCONNECTED FROM GRID

During a disruption the microgrid is designed to power the connected buildings. The buildings can act as a resilient district, providing shelter and a staging location for the region.

pae-engineers.com PAE

25

Keys to unlocking microgrids as scale:

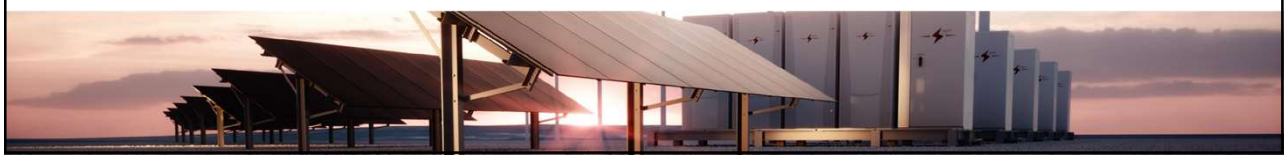
Standard for the overall system, not just the singular pieces

Consistent standards and codes for all elements

Updates to utility interconnection requirements with universal adoption in all regions

Partnerships between utilities, states, and customers

pae-engineers.com PAE



26

Karina Hershberg
PE, LEED AP | ASSOCIATE PRINCIPAL

karina.hersberg@pae-engineers.com

PAE
Engineering that **matters**

503-226-2921
151 SW 1st Avenue, Suite 300
Portland, OR 97204

27