Clean Coalition

Making Clean Local Energy Accessible Now

North Bay Community Resilience Initiative:

The path to energy resilience and sustainability

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Clean Coalition; Areas of Expertise

Analysis & Planning

Full cost and value accounting for DER; siting analysis

- PG&E
- PSEG
- SCE

Grid Modeling & Optimization

Powerflow modeling; DER optimization

- PG&E
- PSEG
- SCE

Program and Policy Design

Grid planning, procurement, and interconnection

- LADWP, Fort Collins, PSEG
- City of Palo Alto (FIT and solar canopy RFP)
- RAM, ReMAT
- Rule 21 & FERC

Community Microgrid Projects

Design and implementation

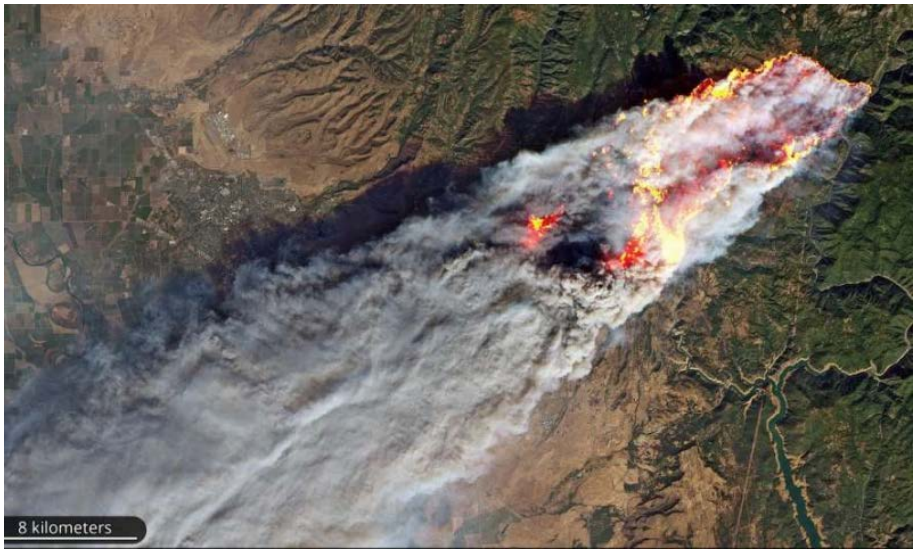
- San Francisco, CA
- Long Island, NY
- Montecito, CA
- U.S. Virgin Islands

Clean Coalition (501c3 nonprofit); Mission

To accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise

Reaction vs. Resilience

Reaction to disaster is how we are operating now, by declaring emergencies, and implementing temporary emergency measures for rapid rebuilding after catastrophic events. This is *important*, however…



Resilience can be created by resolving to move forward proactively *for the long term* in ways that will increase our ability to strategize, rebuild in better ways, adapt, and better manage resources that stay powered and fully capable when catastrophe strikes again.

North Bay Community Resilience Initiative: Aims

- Track, publicize, and support cutting-edge resilience-creating energy efficiency, electrification, and microgrid incentives, plus policy advancements by SCP, MCE, BayREN, BAAQMD, and others.

- Procure and develop a database of model structures with “Community Microgrid-ready” designs: For new and retrofit residential, commercial, and municipal bldgs.

- Develop “Electrification & Community Microgrid Ready” (ECMR) document for homeowners and installers

- Develop Community Microgrid roadmap beginning with “Critical Facility” microgrid pilots such as fire stations, hospitals, and places of refuge.

- Position these pilots in areas that are conducive to expansion into Community Microgrids

- Develop all as a model for resilience in rebuilding, and for ***proactive resilience*** and community modernization

North Bay Community Resilience Initiative: Team

Clean Coalition

Sonoma Clean Power

MCE

PG&E

Minerva Ventures
Charting a Resilient Path

Bay Area Air Quality Management District

County of Sonoma
Energy and Sustainability

biraenergy

rcpa
Regional Climate Protection Authority

Stone Edge Farm Microgrid

Rebuild NorthBay
Foundation

Ann V Edminster
AVE Design AVEnues LLC

Off the Grid Design
Creating a Sustainable Future

center for climate protection

Berkeley Lab

Aim 1: Support and promote Advanced Energy Rebuild programs for Homes and stuctures

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Support for Rebuilding with Efficiency, Electrification, and Resilience

- Sonoma Clean Power (SCP) and MCE Advanced Energy Rebuild: SCP, MCE, Pacific Gas and Electric Company (PG&E), and Bay Area Air Quality Management District have joined efforts to help homeowners affected by the firestorms to rebuild energy-efficient, sustainable homes.
- The SCP program offers two incentive packages tailored to Sonoma and Mendocino Counties.
- Each package has a flexible performance pathway or a simple prescriptive menu. SCP offers up to $17,500 in incentives to electrify, add solar + energy storage, Connected EV's, and upgrade to "connected" appliances
- MCE has similar "Advanced Energy Rebuild" program for the Napa fire rebuilding efforts.

Sonoma Clean Power

PG&E®

Bay Area Air Quality Management District

MCE

Aim 2: Model Structures - Advanced Energy Rebuild Homes

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Showcase and provide case studies of homes being rebuilt utilizing the "**Advanced Energy Rebuild**". Up to $17,500 incentives from Sonoma Clean Power and MCE, to go "all electric" and "microgrid ready"!

Having a "microgrid" means when the power goes out, your power **stays ON!!**

Hirsch Solar Powered Residence

Mini-split Heat Pump

H.P Water Heater

L.G. Chem Energy Storage

Induction Cooking

Model Structures: Design Database

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Developing a **"Design Database"** for model structures for New and retrofit residential, commercial, and municipal buildings

- In collaboration with high "performance based" building organizations in the USA:
  - US DOE Zero Energy Ready Home Program & US DOE "Solar Decathlon" Homes database
  - Passive House Institute US
  - USGBC / New Buildings Institute "Grid-Optimal"
  - Net Zero Energy Coalition
  - Rocky Mountain Institute

ZERO ENERGY READY HOME U.S. DEPARTMENT OF ENERGY

PHIUS Passive House Institute US

nbi new buildings institute

U.S. GREEN BUILDING COUNCIL USGBC

Net-Zero ENERGY COALITION

ROCKY MOUNTAIN INSTITUTE

Electrification & Community Microgrid Ready (ECMR) specifications document

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- Developed by the Clean Coalition and a team of industry experts, as a Guideline for Homeowners and trades installers to easily install necessary wiring to be all-electric and "microgrid ready"

- All-Electric benefits; Safer and healthier homes and communities;
  - Elimination of natural gas which is highly flamable, and produces formaldehyde and other toxic gases within the home and community
  - EV adoption = Reduction and eventual elimination of all fossil fuels
  - EV's can become "mobile energy" assets, saving *and making* money
  - Reduced reliance on outside fuel & energy sources
  - Reduction of greenhouse gases
  - REVENUE for homeowners by using your connected assets as grid assets

- Microgrid benefits; Energy resilient homes and communities
  - Ability to stay powered in grid outages = Resilience and Security
  - Ability to use behind the meter and community energy storage as "grid assets" = revenue stream
  - Energy produced by local renewable sources = local jobs

Microgrids and Community Microgrids

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- **Microgrid**: A coordinated set of behind-the-meter (BTM) local renewable energy, energy storage, and other Distributed Energy Resources (DER) that can be islanded (from the local grid) at the customer meter.

- **Community Microgrid**: A coordinated set of local renewables, energy storage, and other DER that can also be islanded, (from the larger grid) across a defined distribution grid area to provide indefinite renewables-driven resilience to critical community facilities, and other structures within the community.

Benefits of Microgrids

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- **Financial and Impacts of Building or "Unit" Scale Microgrids**

- Lower operation costs (near "0" energy bills)
- Revenue from excess energy export (HOA **dividends**??)
- Renewable transportation energy – (100% R.E. EV charging)
- All electric and "tighter" buildings = better I.A.Q. = healthier homes
- Energy "resilience", and fire "resilience" (with fire resistive materials)
- Home is a community resilience asset / and a grid asset
- Elimination of fossil fuels (reduced GHG emissions)
- Safer buildings and communities

- **= Higher appraised property values**

Critical Facility Microgrids

- **Critical Facility Microgrids**; “Island” from the Grid in the event of grid outage or disruption to power critical loads for community services, safety, and security. They include renewable energy, and energy storage assets.
  - **Hospitals**; Kaiser Permanente Richmond Microgrid
  - **Fire Stations**; City of Fremont Fire Station Microgrid
  - **Places of refuge**; Seattle Community Center Microgrid
  - **Campus Microgrids;** Stone Edge Farm Microgrid

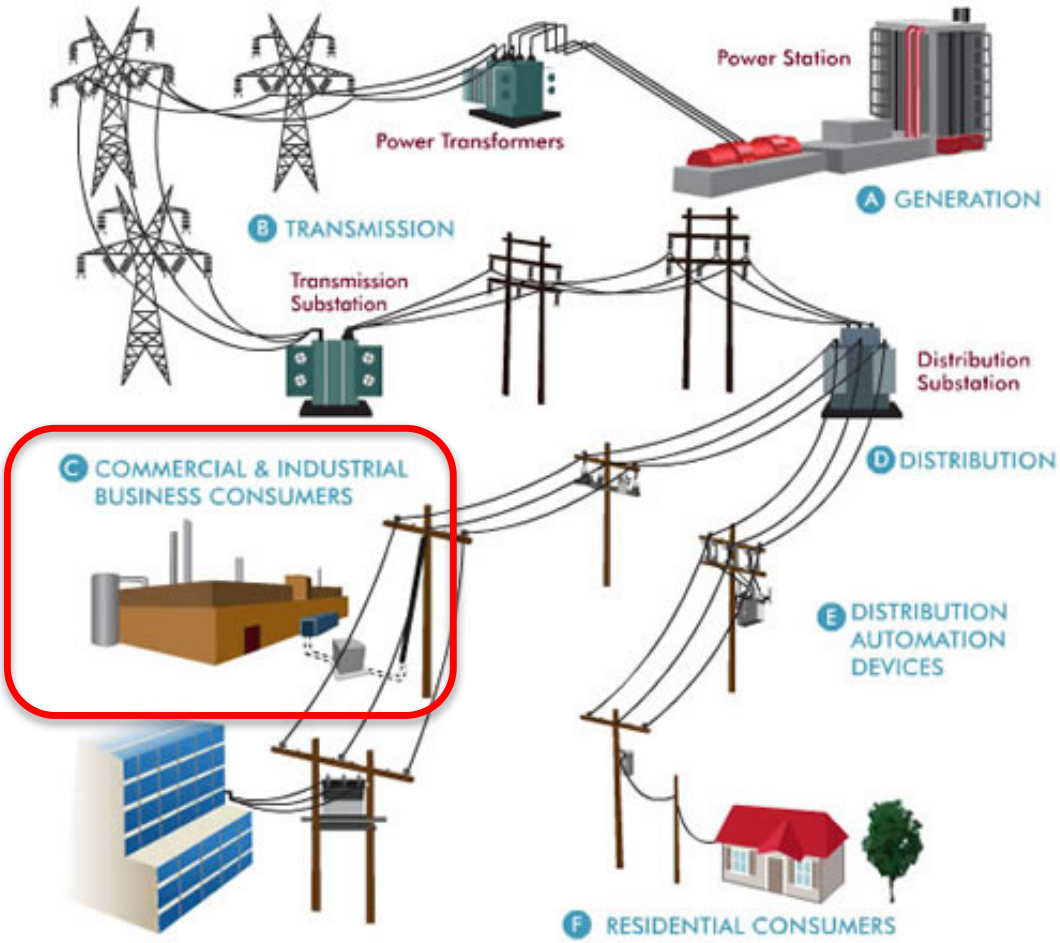
Kaiser Permanente Richmond Microgrid

Freemont Fire Station MIcrogrid

Seattle Community Center Microgrid

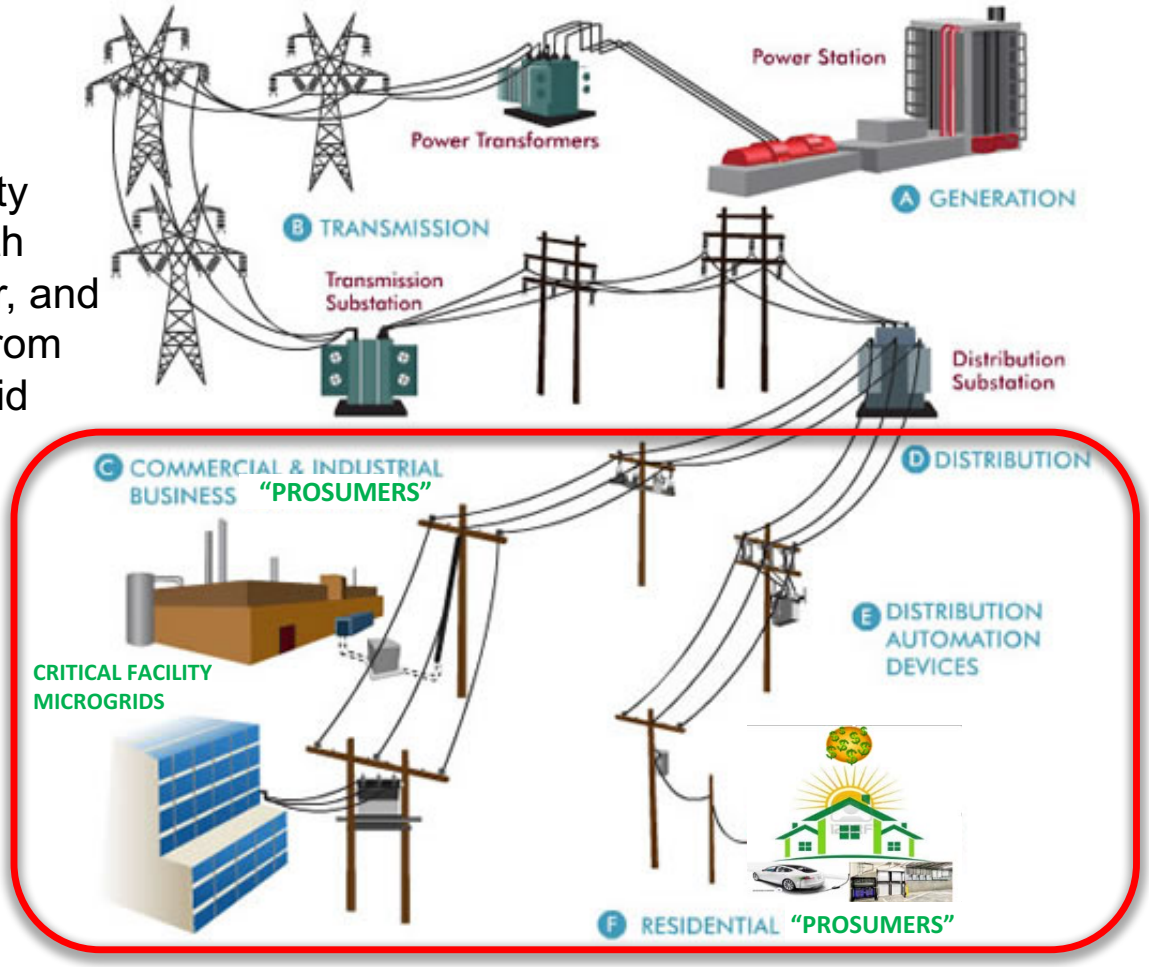
Stone Edge Farm Microgrid

Critical Facility microgrids focus on single customers



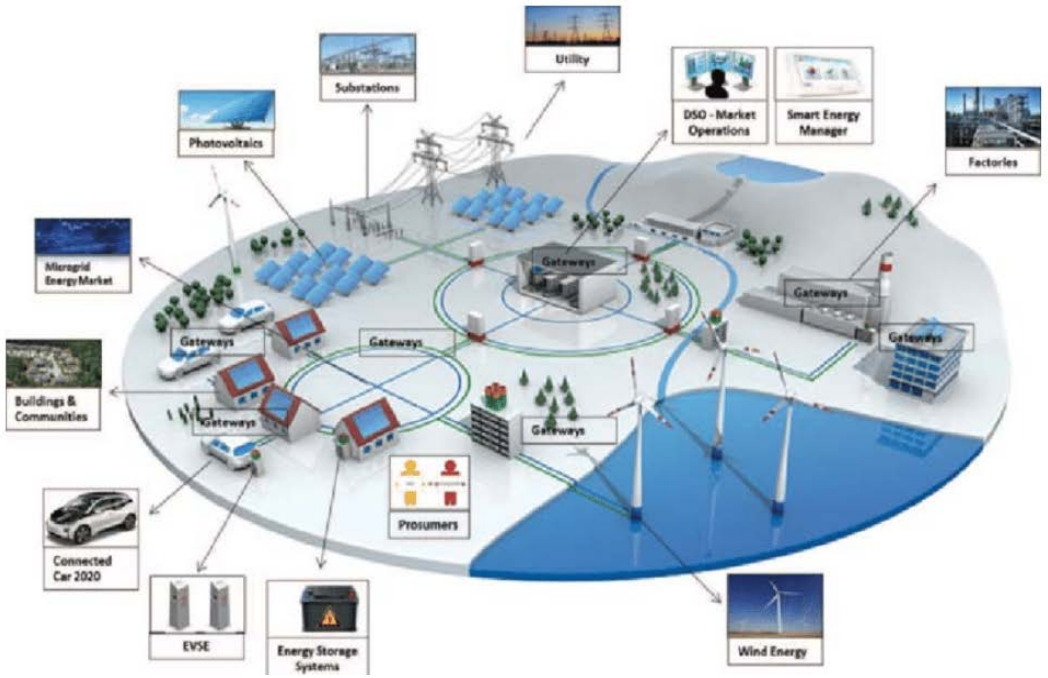
Community Microgrids can serve up to thousands of "prosumer" and "consumer" utility customers

"**Prosumers**": Utility customers that both produce energy for, and consume energy from the grid or microgrid



Community Microgrid benefits

- Reliability and power continuity
- Local control of energy
- Permanent local jobs in energy, installation, and maintenance
- Local energy for EV transportatic systems
- Network of “Prosumers” share th use, generation, and revenue of from energy.
- No “Peaker” Power Plants
- Reduced transmission losses
- Enhanced safety
- GHG reductions
- Resilience and energy security
- National Security
- Reduced Global conflicts
- Peace time infrastructure spending



CEC California Microgid Roadmap

to thousands of “prosumer” and “consumer” utility customers

Future Trends: "Mobile Energy" Microgrids

- **Microgrids + bi-directional EV's = Aggregated "Mobile" Community Microgrids**

- **Solar PV can export to grid or charge EV's at daytime when solar energy is peaking**
  - **EV's can bring that energy "home" and use for residential power at evening/night**

- **Charge EV's when rates are low, and use in evening when rates are high (load shifting)**

- **Once stationary and mobile ancillary ESS grid services are enabled at scale,**
  - **(and aggregated) fossil fuel peaker plants become unnecessary**

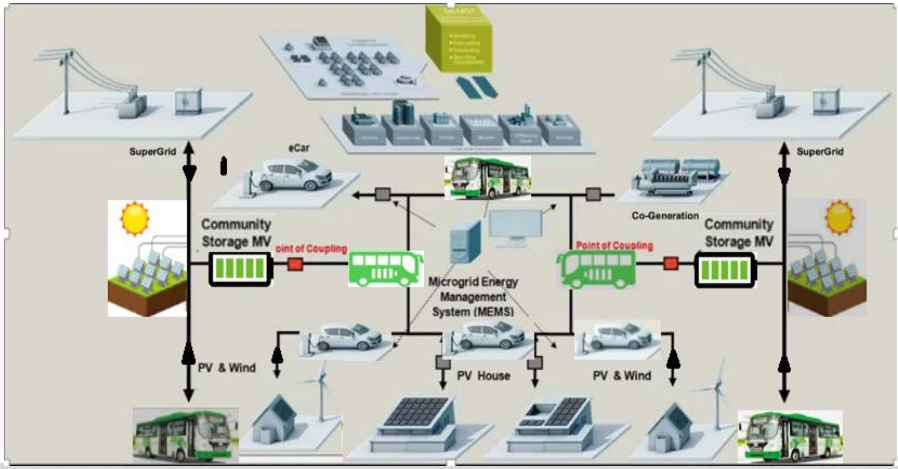
- **More behind meter ESS + mobile ESS assets results**
  - **in reduced need for community scale solar / wind + ESS's**

- **Greater resilience is created by virtue of distributed**
  - **systems, and fewer single points of failure**

- **"Mobile energy" from bi-directional EV's**
  - **reduces need for site based ESS & transmission wires**

- **Add Community Scale R.E. & (mobile) storage at**
  - **points of grid connection to provide ancillary**
  - **grid and microgrid services = revenue for the microgrid**

Volkswagen Announces: "Elli"



Thank you for your time!

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Questions?

Community Microgrid Benefits

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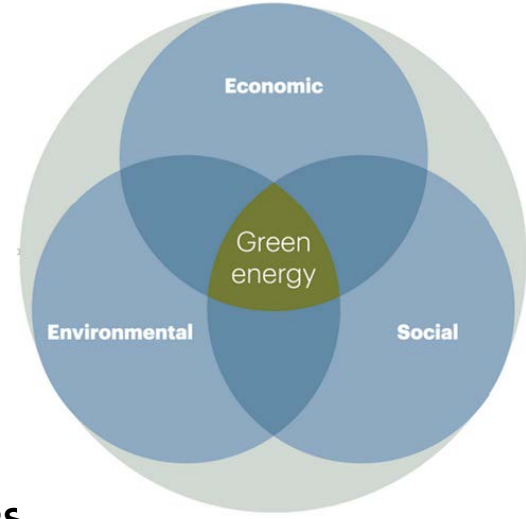
Benefits and dividend$

SOCIAL / ENVIRONMENTAL IMPACTS



- NO “PEAKER” POWER PLANT INVESTMENT
- REDUCED ENERGY TRANSMISSION INFRASTRCUTURE
- PERMANENT LOCAL EMPLOYMENT IN ENERGY AND INFRASTRUCTURE
- GHG REDUCTION IN BUILDINGS / LIVING / WORK / TRANSPORTATION SECTORS
- CLIMATE CHANGE MITIGATION
- IMPROVED COMMUNITY & NATIONAL HEALTH
- BUILDING and COMMUNITY ENERGY RESILIENCE
- NATIONAL and GLOBAL ENERGY RESILIENCE
- NO MORE NEED FOR ENERGY CONFLICTS (WARS OVER OIL/ENERGY)
- “PEACETIME” NATIONAL BUDGET EXPENDITURES

= GREATER INVESTMENT IN RENEWABLE COMMUNITY MICROGRIDS