

# North Bay Community Resilience Initiative: The Path to Resilience and Sustainability



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

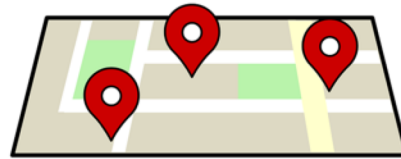
## Expertise areas



### 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

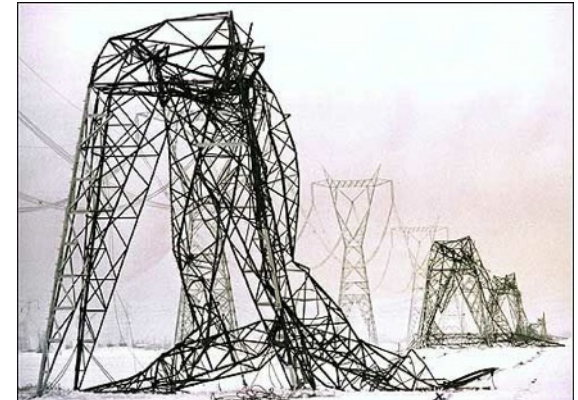
Design and implementation

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

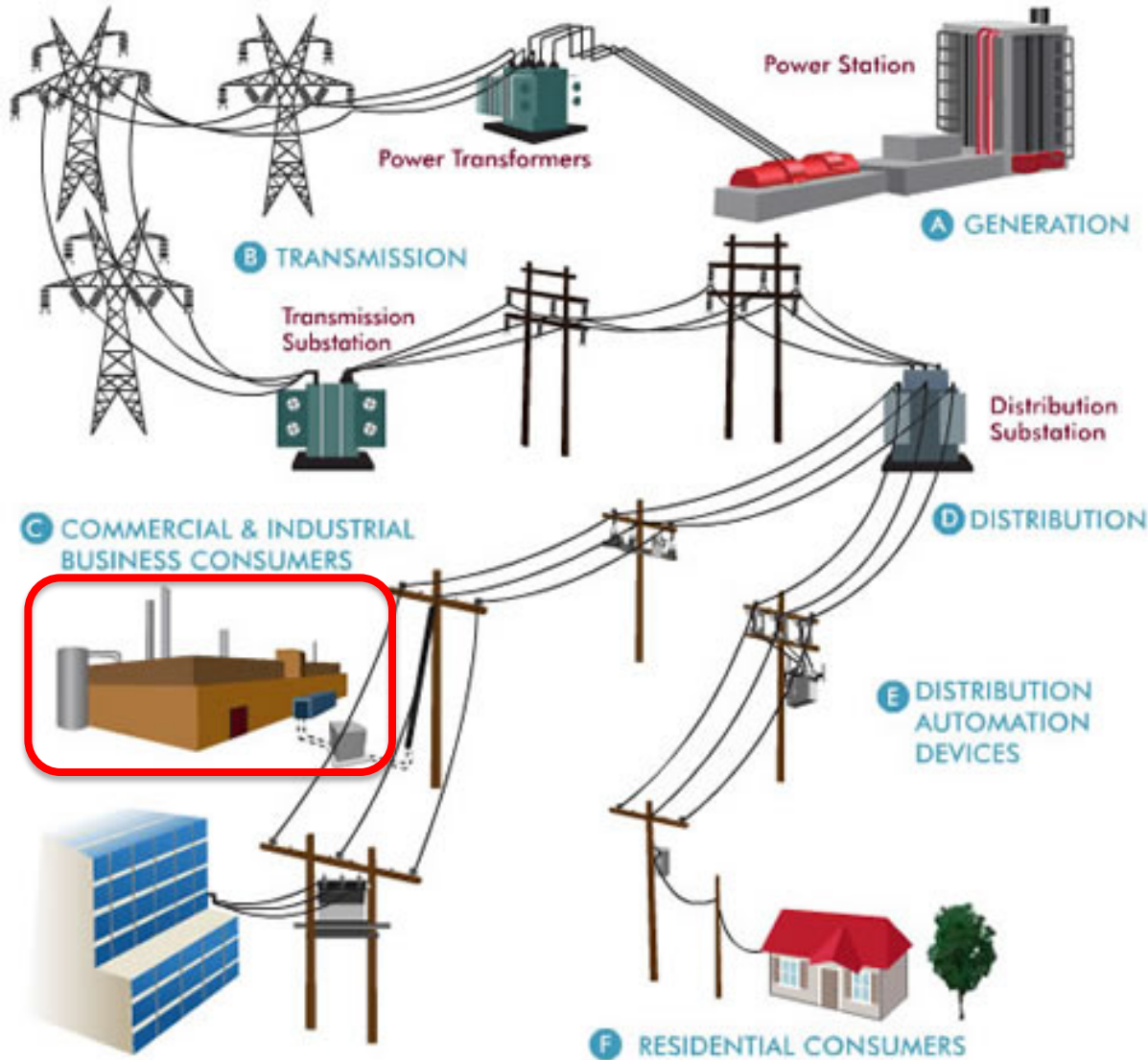
Our legacy, centralized energy architecture carries multiple critical risks.

- This architecture is **costly, aging, inefficient**, and a **highly vulnerable security risk**
- **Extreme weather events** are occurring more frequently, further demonstrating the **vulnerability** and **high cost**
- **Cyber attacks** are a **growing risk**, and an attack on a centralized system can **affect millions**
- To ensure both **local and national security**, we must move quickly to a new solution

**Community Microgrids:  
Cleaner, more reliable and resilient, more affordable**

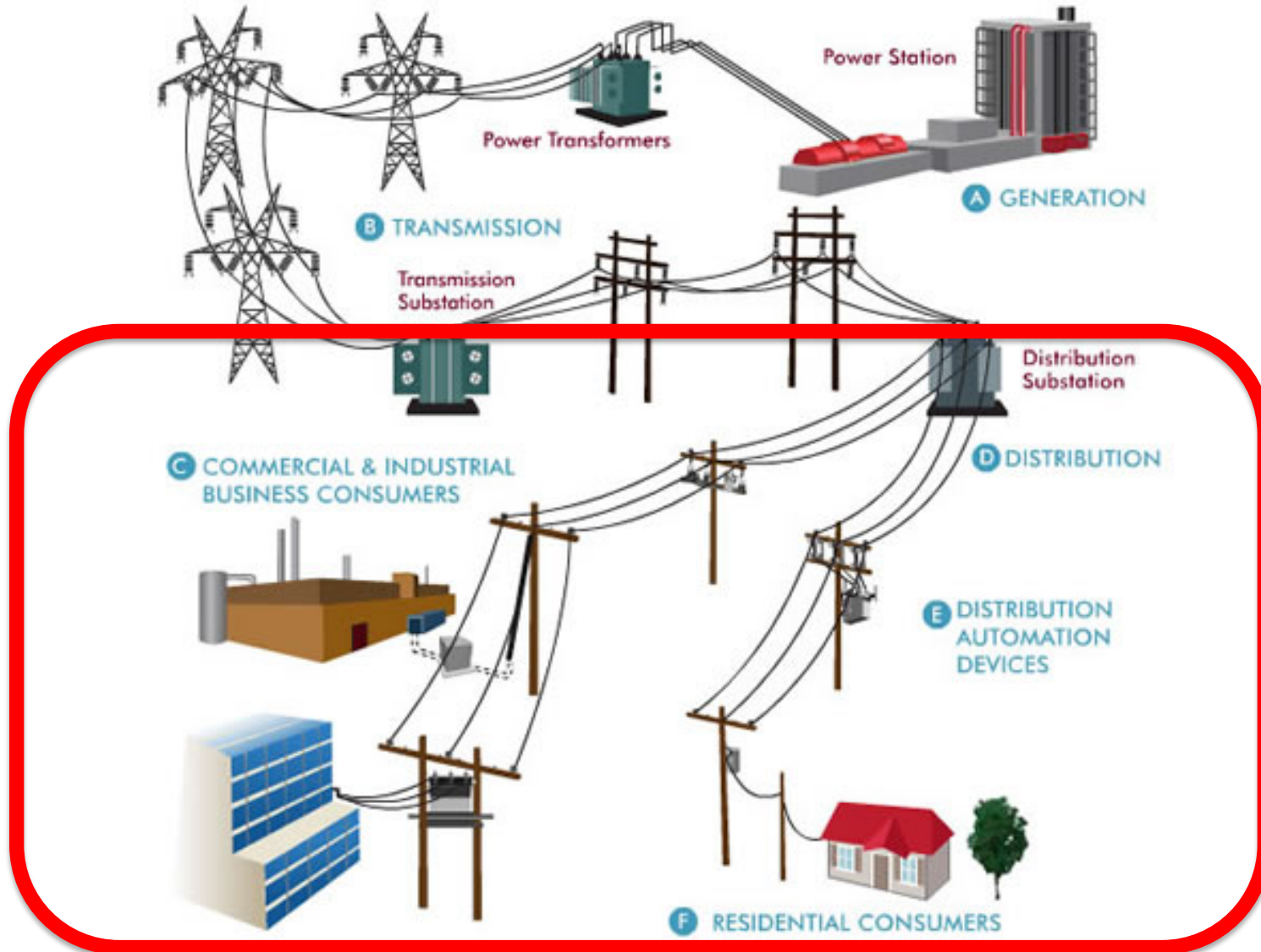


# Traditional microgrids focus on single customers



Source: Oncor Electric Delivery Company

# Community Microgrids serve thousands of customers



Source: Oncor Electric Delivery Company

Community Microgrids are a modern approach for designing and operating the electric grid, stacked with local renewables and staged for resilience.

Key features:

- A targeted and coordinated **local grid area** served by one or more distribution substations
- **Optimal penetrations of clean local energy** and other Distributed Energy Resources (DER) such as energy storage and demand response
- **Ongoing, renewables-driven backup power** for critical and prioritized loads across the grid area
- A solution that can be **readily extended** throughout a utility service territory – **and replicated** into any utility service territory around the world



A Community Microgrid brings communities four benefits that are not provided by today's mostly centralized energy system.

## 1. Lower costs and increased economic investment

- Reduces the cost of electricity by eliminating expensive peak periods and associated infrastructure costs
- Increases local economic investment

## 2. Improved overall performance

- Replaces fossil fuels, improves grid performance, and serves local transportation needs
- Provides better outcomes for all stakeholders

## 3. Resilience and security

- Provides ongoing power to critical and priority loads in communities
- Can withstand multiple disaster and/or cybersecurity scenarios

## 4. Replicable and scalable model

- Can cover an entire substation area
- Can be scaled and deployed in any community





# Community Microgrids: Benefits analysis

## Example target: 30 MW Solar PV Benefits over 20 years



### Energy

- Cost parity:** Solar vs. NG, LCOE
- \$150M:** Spent locally vs. remotely
- \$50M:** Avoided transmission costs
- \$20M:** Avoided power interruptions



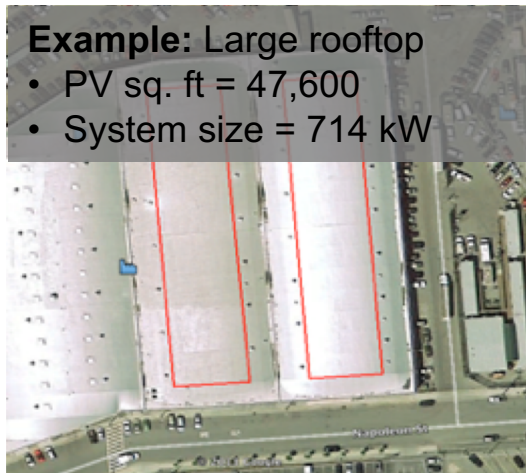
### Economic

- \$120M:** New regional impact
- \$60M:** Added local wages
- 1,000 job-years:** New near-term and ongoing employment
- \$6M:** Site leasing income



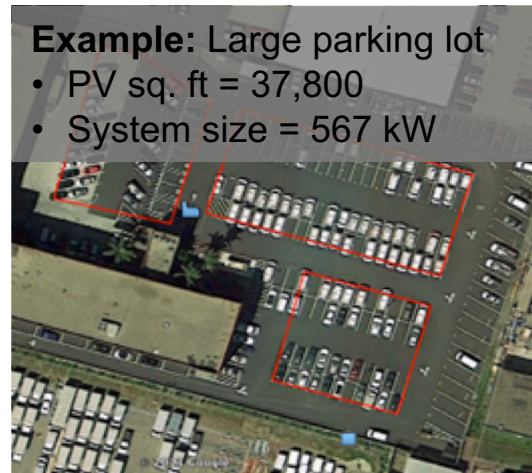
### Environmental

- 46M pounds:** Annual reductions in GHG emissions
- 10M gallons:** Annual water savings
- 225:** Acres of land preserved



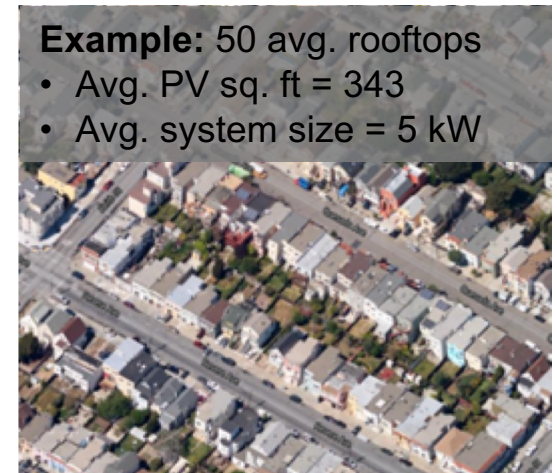
- Example:** Large rooftop
- PV sq. ft = 47,600
  - System size = 714 kW

**Commercial: 18 MW**



- Example:** Large parking lot
- PV sq. ft = 37,800
  - System size = 567 kW

**Parking lots: 2 MW**



- Example:** 50 avg. rooftops
- Avg. PV sq. ft = 343
  - Avg. system size = 5 kW

**Residential & MDU: 10 MW**

## Objective: make energy abundant, affordable, resilient, and sustainable

1. **Rebuild fire-destroyed areas with high levels of sustainability** in homes, buildings, and the electric grid, enabling a modern, distributed, and carbon-free system that delivers substantial economic, environmental, and resilience benefits.
2. **Establish a blueprint for rebuilding disaster-destroyed areas** in a timely and cost-effective manner that also maximizes the economic and resilience value of energy as a critical resource to ratepayers, property owners, and municipalities.
3. **Provide a model for operating a modern distribution grid** that incorporates optimal distributed energy resources, cost-effective local balancing, full interaction with the transmission system, and local energy markets — with resulting benefits across both grid operations and economics.
4. **Ensure that building codes are advanced** to achieve more resilient, safer, and cleaner building stock and communities.
5. **Lower ratepayer costs:** DER will be utilized to defer or avoid substantial costs in centralized energy delivery, including peak energy procurement and transmission & distribution (T&D) infrastructure investments.



# North Bay Community Resilience Initiative

- Homes and buildings are grid partners
- Well-designed and well-situated ZNE homes: A valuable part of the resource mix when combined with larger PV arrays on commercial and industrial structures



## Support for rebuild

- Sonoma Clean Power (SCP), Pacific Gas and Electric Company (PG&E), and Bay Area Air Quality Management District have joined efforts to help homeowners affected by the October 2017 firestorms rebuild energy-efficient, sustainable homes.
- The program will be an enhancement to PG&E's long-standing California Advanced Homes Program, and offers two incentive packages tailored to Sonoma and Mendocino Counties.
- Each package has a flexible performance pathway or a simple prescriptive menu.
- For questions about the program, please e-mail [programs@sonomacleanpower.org](mailto:programs@sonomacleanpower.org).

## Advanced Energy Rebuild for Homes

- Program scheduled to launch in early May
- Check back in early April for details on incentives and criteria.

<https://sonomacleanpower.org/advancedenergyrebuild/>



# Advanced Energy Rebuild for Homes

**1** **Advanced Energy Home**

**\$7,500**

**Flexible Performance Path**

- 20% above code
- 220V outlet at stove/range, water heater, and clothes dryer
- Design roof for additional structural loads associated with solar panels, and add conduit for future installation
- Electric Vehicle Charging Station - Equipment free from Sonoma Clean Power

**2** **All Electric Home**

**\$12,500**

**Flexible Performance Path**

- 20% above code, all electric end uses
- Design roof for additional structural loads associated with solar panels, and add conduit for future installation
- Electric Vehicle Charging Station - Equipment free from Sonoma Clean Power

**\$7,500**

**Simple Prescriptive Path**

- 2016 Code High Performance Walls or 2016 Code High Performance Attics
- 2019 Code windows (Max U-factor 0.30, SHGC 0.23)
- High efficiency water heater: Heat Pump w/ EF of 3.0+ or gas tankless w/ EF of 0.92 with 220v outlet
- Heating/cooling ducts that are well sealed, insulated (R-8), and located primarily in conditioned space (note: buried deeply in attic insulation can qualify)
- WaterSense efficient plumbing fixtures
- Water efficient landscaping
- Energy Star Appliances
- 220V outlet at stove/range and clothes dryer
- Electric Vehicle Charging Station – Equipment free from Sonoma Clean Power

**\$12,500**

**Simple Prescriptive Path**

All features of Advanced Energy Home plus...

- 2016 code High Performance Walls
- 2016 Code High Performance Attics
- Insulation inspected by a HERS Rater (QII)
- "Cool" roof
- Building Enclosure Airtightness verified by a HERS Rater (less than 3 ACH50)
- NEEA tier 3.0+ HPWH w/ controls
- High efficiency heat pumps for heating/cooling (EER of 12.5+, HSPF of 9.5+)
- Smart thermostat
- Compact plumbing design
- Induction cooking
- Electric or heat pump clothes dryer
- Electric Vehicle Charging Station – Equipment free from Sonoma Clean Power



**+** **Add solar to either option**

**\$5,000**

- Solar panel system designed to fully offset annual electric usage with battery storage sufficient to hold 30% of one summer day's production;

**OR**

- Pre-purchase of 20-year premium on 100% local renewable power (e.g., EverGreen or SolarChoice).

## Team

- Clean Coalition
- Sonoma Clean Power
- PG&E
- Rebuild North Bay
- Center for Climate Protection
- County of Sonoma, Energy & Sustainability Division
- Regional Climate Protection Authority
- Bay Area Air Quality Management District
- Design AVEnues, LLC — EE/ZNE expert Ann Edminster
- Stone Edge Farm Microgrid



REBUILD NORTHBAY  
FOUNDATION



COUNTY OF SONOMA  
ENERGY AND SUSTAINABILITY



Stone Edge Farm  
Microgrid