PG&E: Community Microgrids

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Company Overview

Who is PG&E? What have they done? & Where should they go next?
Company Overview

- Electric & Natural Gas provider in Northern California
- Founded in 1905
- Serves 5.2 Million Households
- Investor-Owned Utility (IOU)
- Services include power generation, transmission, & distribution
“PG&E is the utility Californians love to hate”

- PG&E was found liable for causing major wildfires in 2017 & 2018.
- Filed for bankruptcy in 2019.
- $59 billion wildfire mitigation plan.
- Facing pressure to become publicly-owned utility.
PG&E’s current grid intersects high fire risk areas and creates risks for the company and public.
PG&E needs a new strategy to:

- Maintain Public/Wildlife Safety
- Regain public trust
- Stay ahead of regulation
- Stay relevant within sustainability
PG&E’s Green Swan Potential
Where are the opportunities for PG&E?
Industry & Competitors

PG&E is a regulated Investor-Owned Utility.

The California electricity market is a monopoly.

Consumers didn’t used to have a choice where their energy came from - then came Community Choice Aggregation.
Community Microgrids

Circular Business Models:

Circular Inputs:
Decarbonize through renewable energy

Sharing Platforms:
Decentralize through CCAs and tech for bidirectional power flows

Product as a Service:
Digitize through service-centric delivery (as grid services provider)
Central Utility Power Station

**Single Customer Microgrid—Synchronizing**
- Utility Meter
- Synchronizing Isolation Breaker
- Local Generator
- Local Power Demands

**Single Customer Microgrid—Non-Synchronizing**
- Utility Meter
- Isolation Breaker
- Local Power Demands

**Customer Microgrids w/Multiple Users**
- Utility Meter
- Synchronizing Isolation Breaker
- Local Generator
- Local Power Demands
- Local Storage

Source: P. De Martini, Adapted from Microgrid Resource Center, 2020.
Value Drivers for Community Microgrids

**Cost Savings**
Reduce operating and maintenance costs, operational waste, and transmission/distribution energy losses

**Risk Reduction**
Reduce infrastructure damage liability, fire ignition risk, and new tech investment risk

**Brand Enhancement**
Shift in public perception through CCAs - investment matching, meeting demand, lower rates, building trust
Microgrid Enabling Technology

- IoT digital infrastructure
- Advanced supervisory and autonomous control systems
- Predictive analytics
- R&D for long-duration energy storage technologies
- Innovation to digitize customer service and tech support
The Community Microgrid Program

How should PG&E implement this program?
Our Approach

- Community microgrid
- Funding
- PG&E
- CCA
- Community

- CPUC
- Microgrid integration experts
- Renewable energy projects
- Microgrid vendors
Recommendations

1. Lead the change by pushing for a fair and consistent microgrid tariff for all California IOUs
2. Form regional operating units to better serve communities
3. Develop a territory-wide microgrid implementation plan
4. Transform business model by becoming grid services company
Microgrid tariff approved
PG&E breaks ground on its 20th community microgrid project
PG&E completely transforms business model to become a grid services company
PG&E wins Grid Edge Innovation award
PSPS are a thing of the past
PG&E grid 100% powered by renewable energy
Implementation Timeline
Thanks!

Any questions?
Appendix
A line of cars waiting to fuel up stretches down the block at the Blue Lake Rancheria gas station, which used microgrid technology, including the solar panels above the pumps, to keep operating through the blackout. - PHOTO BY MARK MCKENNA
PG&E’s electric system is designed and built to deliver safe, reliable power to customers in Northern and Central California. PG&E produces or buys its power from a mix of conventional and renewable generating sources, which travel through the electric transmission and distribution systems to reach our customers.

1. **PG&E-owned generators**
   PG&E’s electricity is generated by many producers. The process starts with a diverse mix of generating sources. PG&E’s generating plants make electricity by hydropower, gas-fired steam and nuclear energy.

2. **Independent generators**
   PG&E acquires electricity from over 400 plants owned by independent power producers or qualified facilities, and adds it to PG&E for resale to our customers.

3. **Out-of-state generators**
   We also buy electricity for our customers from sources outside of PG&E’s area, which is transmitted across several states.

4. **Transmission system**
   Electricity is carried over the bulk electric grid, a “network” of high-voltage transmission lines that connect power plants to substations, and link our system to neighboring ones.

5. **Substations**
   Substations are critical junctions and switching points in the electric system, connecting the transmission system to the distribution one. Substations use transformers to lower the voltage of electricity.

6. **Distribution system**
   The distribution system links the transmission system and most customers. It includes: main or “primary” lines and lower voltage or “secondary” lines, which deliver electricity either overhead or underground; distribution transformers, which lower voltage to usable levels; and switching equipment to permit the lines to be connected together in various combinations and patterns.

7. **Individual services**
   Individual services, or “drops,” connect the distribution system to the customer — industrial, commercial, agricultural or residential.
Supporting Policy

SB 350 & 1339
PG&E reorganization plan
California Public Utilities Commission
R.19-09-009
Our Approach

Internal Funding
- Up to $5 million of cost associated with microgrid equipment
- PG&E will provide online resources, tech support, & personnel.

Covers equipment such as:
- Isolation Devices
- Microgrid Controller
- Fault Protection

Gov't funding will cover project management costs for PG&E and salaries and wages for local jobs.

External Funding
- State Funding
  - The California Commission Energy Efficiency Program and state taxes

- Local Funding
  - Local Governments Deenergization Event Resiliency Program and local taxes
  - These programs will fund: energy storage/generation equipment, land, facilities and equipment installation.

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Implementation Timeline

1. Receive approval for CMEP Program
2. Identify communities with
3. Recruit communities within highest risk county
4. Contract at least 20 projects within the county.
5. Complete Projects within two years of contract completion
6. Expand to new counties each year.
Our Approach

- Internal & External Funding
- Identify ideal communities
Energy Industry’s Waste Materials

- Use of non-renewable energy
- Plant Operations
- Energy Loss
- Premature Retirement of Equipment
Wildfire season is here. Are you prepared for power shutoffs?

PG&E is working to make shutoffs shorter and smaller, but they may still be necessary to protect customers and first responders. See our checklists and available support.

PREPARE FOR POWER SHUTOFFS  
CLOSE
Fig. 8.1 Waste analysis diagram
ELECTRICITY
CCA procures clean energy sources

DELIVERY
IOU delivers energy and maintains the grid

CUSTOMER
Cleaner energy, local control and competitive rates!
PGE transmission line

Tier 2 fire risk

Tier 3 fire risk