Finding the Balance Between Economics, Sustainability, and Energy Security with Microgrid Technology

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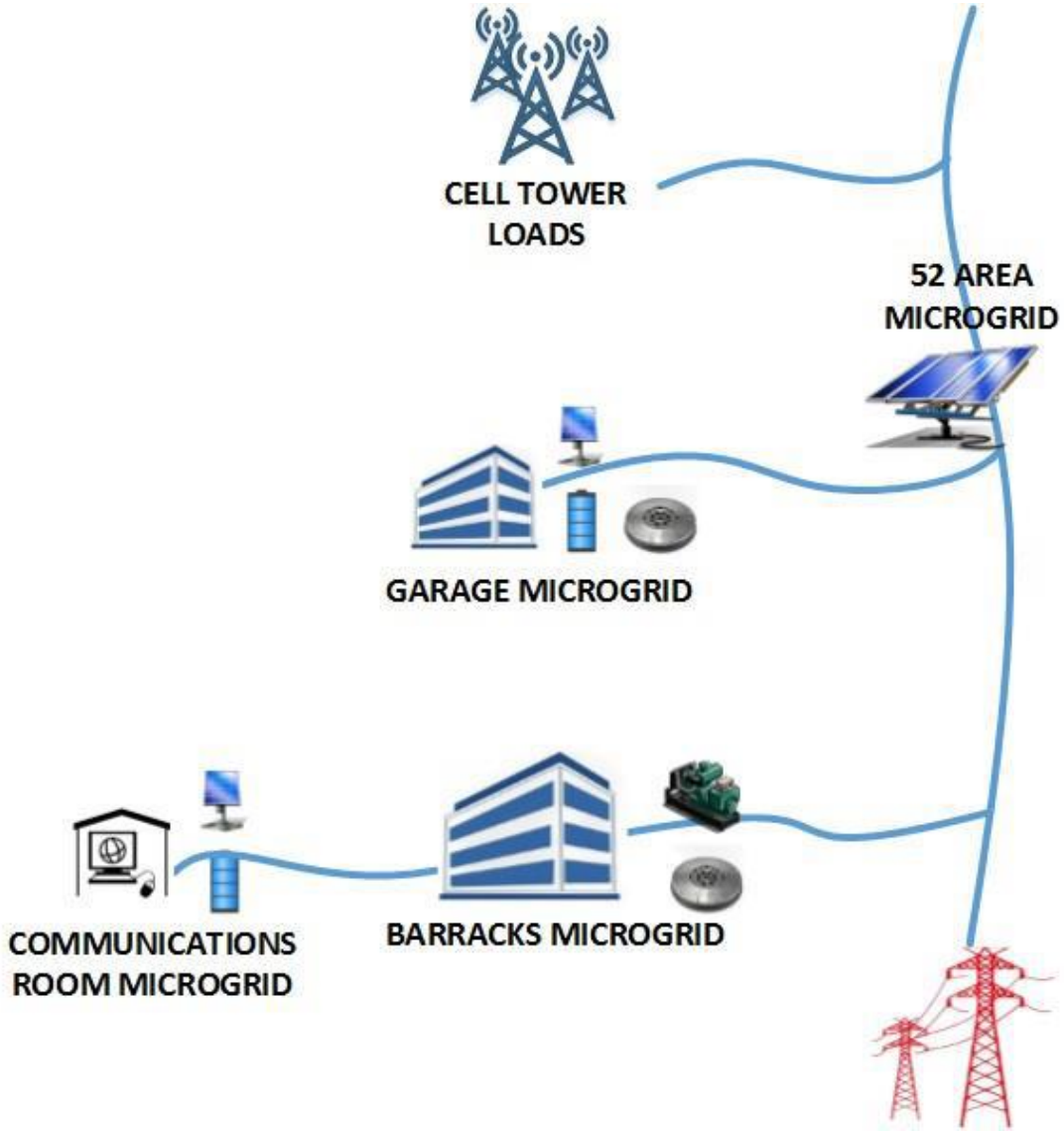
Clean Spark

Our Start: MCB Camp Pendleton FractalGrid

- Project EC-PIR-12-033 completed in 2014
- Illustrates the notion of interconnected microgrids
- Each with renewable generation, storage, and control that work together in concert during normal operation
- But island and harden during energy security events



What is Currently Driving Adoption of Microgrid Technology?

- Reduce Expenses
- Energy Security During Grid Outage to Maintain Ops
- Sustainable and Flexible Energy Cost Certainty
- Improve Poor Power Quality for Equipment
- Overcome No or Significantly Delayed Utility Power

Our Partners Leverage us as their Vendor Agnostic SME

1. Software and Controls
    1. mVSO (Analytis Software
    2. mPulse (Control Software)
2. Equipment Sales
    1. LV & MV Switchgear
    2. Integrated Power Centers
3. Support Services
    1. Electrical Engineering and Grid Develoment Services

Our Projects Deliver Value and Security

- Meaningful expense reduction
- On-site power generation from dedicated systems
- Outage ride through via BESS
- Standby generator failover with runtime optimization
- Power quality improvement
- Flexibility for future expansion with operation scaling
- Better power service
- Reduced expense increasing NOI and NAV

Traditional Use Cases

- Defense
- Remote Communities
- Disaster Prone Areas
- Higher Education
- Hospitals
- Data centers
- Detention Centers

About Clan Spark: Microgrid Power Solutions

- Optimization
- Starts with a baseline: energy & cost
- Knowing your load profile & how it changes
- New costs and savings after system installation
- Start with “why?” value

When Economics and Energy Security are Important

- Economic operation
- Until critical power
- Correct and reconfigure
- Resume normal opertion

Real World Considerations for Optimum System Operation

- Diverse Device Connections
- Protocol Interoperability
- Compute, Access, & Action
- And don’t forget about SPEED and SAFETY

Consider Hybrid-Cloud Solutions

Site

- Raw observations streamed for further analytics
- Data encrypted over the wire
- Token based limited scope communication
- Optimization logic on-site
- Resilient disconnected operation
- Vendor and configuration agnostics
- Site network security with limited external footprint

Cloud

- Powerful operational insights
- Forecasts & intelligence
- Robust utility tariff library
- Savings based economic dispatch
- Infinitely scalable cloud resources
- Secure directed communication
- Secure web-based customer portal
- Automated 24/7 monitoring with alarms and alerts
- Microgrid performance reports
- robust microservice architecture

Increasing Applicability with Economics

- Successful past experience with DER
- Innovation and Sustainability Minded
- Examples:
  - Defense
  - Commercial
  - Industrial
  - Municipality

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