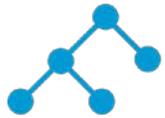


# Community Scale Renewable Energy Integration Workshop



**FRACTALGRID**

Demonstration Project

Area 52 – Camp Pendleton

**CLEAN SPARK**

# Community Overview

- 800 residential inhabitants
- 10 commercial administrative offices
- 300 stall parking garage
- 2 cell towers
- 1 million gallon water tank
- 4 EV charging stations



# Project Overview

## Generator

CPV – 225kW

Carport PV – 300kW

PV – 5kW

## Distribution

120v to 12kV

Islandable at all levels

## Storage

240kW kinetic energy storage

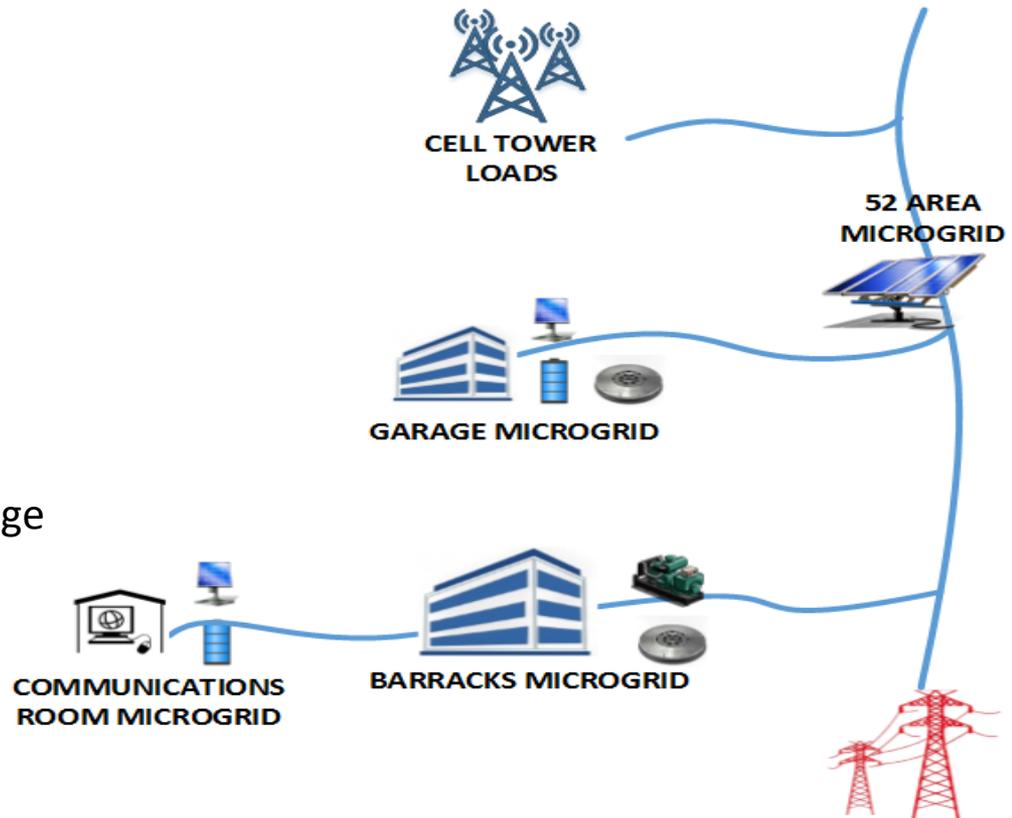
60kW of distributed storage (GEL, lead acid, Li)

## Legacy Assets

200kW Diesel GenSet

18,000 lf of geothermal

4 EV charging stations



# Project Partners



Partner/Host



General-Contractor

CLEAN SPARK

Designer/Integrator/Installer/Operator



AES Partner



Electrical  
Engineering/Market Data

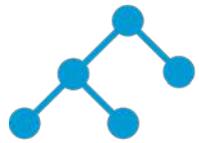
# Project Goals

## Onset

- **Carbon Footprint Reduction – significant reduction of 1,800 lbs of CO2 per day**
- **Consumption reduction – reduced community consumption up to 30%**
- **Peak Load Management – completely eliminated peak loads and provided smooth power consumption from ‘utility’**

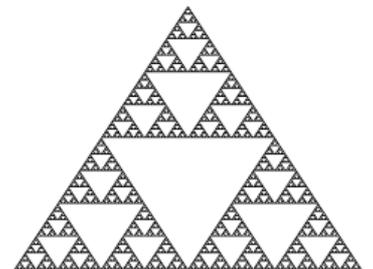
## Mid-stream

- **25 year system life, minimum with only PV degradation**
- **\*100% Renewable Energy Penetration**



# FRACTALGRID

- A fractal is a self similar recursive pattern that allows for a microgrid-inside-microgrid solution
- In order for community scale, rapid transformation this architectural approach must be employed
- First of its kind, breaks down all barriers to 100% renewable penetration



## Technological Innovations



- **Seamless integration of all edge devices, generation, and storage technologies**
- **Interoperability with local grid conditions**
- **Demand response enabled**
- **Real-time situational awareness and control**
- **Cyber secure, lightweight distributed control architecture**

# Technological Innovations



## **Environmental Friendly**

**Manufactured from recycled materials**

**100% recyclable**

**No hazardous materials**

## **High Capacity**

**120 kWh per unit**

**50,000 minimum full charge/discharge cycles**

**No storage degradation over time**

## **Low Cost**

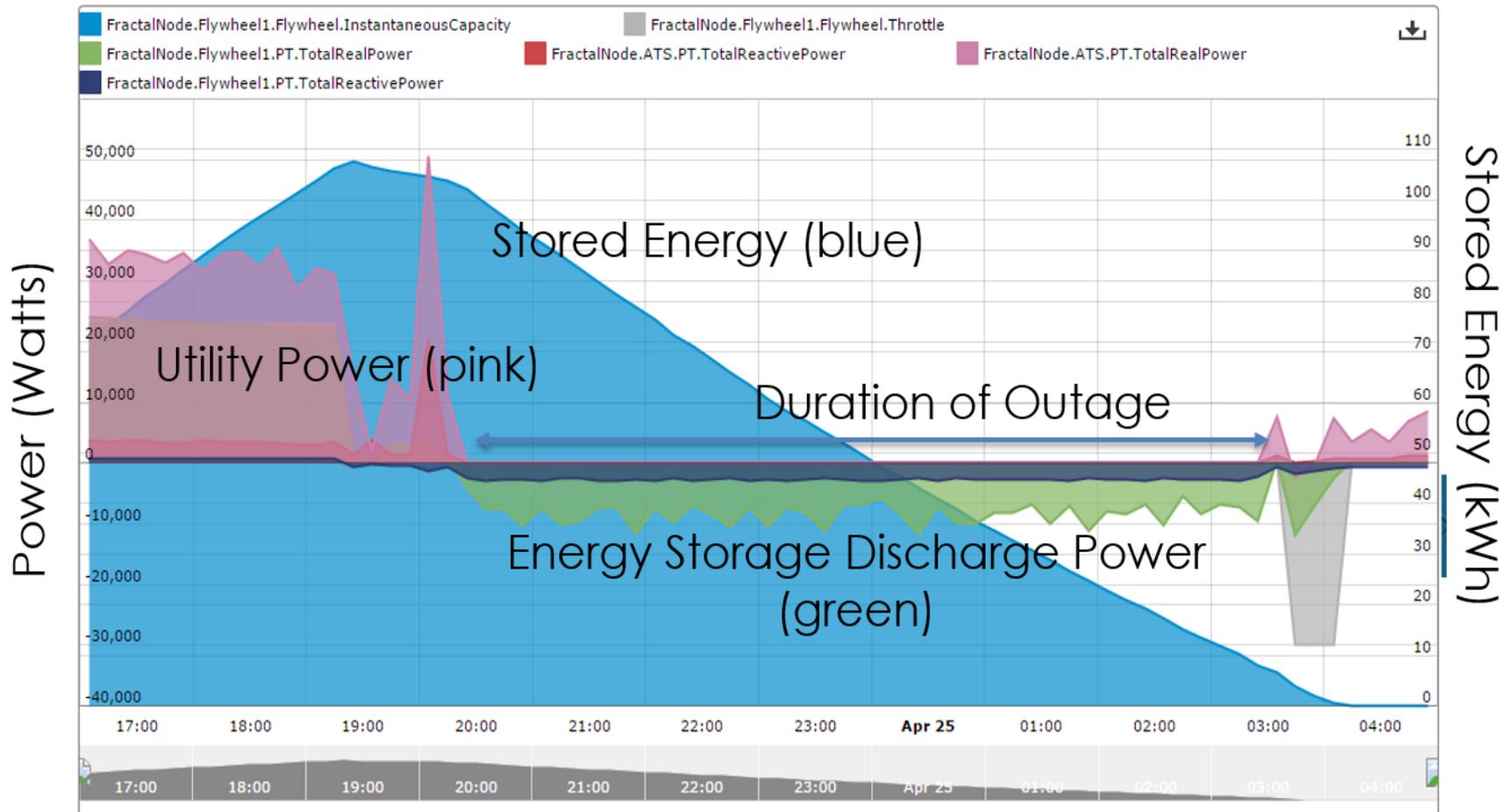
**Rapid Deployment**

**Low maintenance**

**Virtual O&M**

# Community Benefits

## Energy Security



April 24<sup>th</sup>, 2015

## Community Benefits

- **Cost savings - \$1.8M savings over the system life**
- **Significantly reduced carbon footprint**
- **Increased awareness of readiness of these solutions**
- **Expansion planned and currently under negotiation**

# California Energy Commission & California Communities

- **Without California Energy Commission funding this project would not have happened**
- **Communities should engage in distributed microgrid programs immediately**
  - **What if...there was a significant shortage of energy in 4 years**
  - **What if...simultaneously 10% of current generation disappeared**
- **First step is to form a CCA (CAC Forum in San Diego tomorrow)**
- **Legislature needs to ensure private citizens rights to deploy such systems free of external intervention or delay can occur**
- **This is a call to action**

Thank You

CLEANS PARK

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