
# Rincon Solar Microgrids

NOVEMBER 19, 2024

DOE TRIBAL ENERGY REVIEW

# The Rincon Reservation and Community

- The Rincon Reservation was established in 1875 and is located in southern California. The Reservation encompasses approximately 5,000 acres of land within the San Luis Rey River Watershed.

- The Reservation is considered a rural area of unincorporated, north central San Diego County and includes a broad range of wildlife species and vegetation communities.

# The Rincon Reservation and Community

- Approximately 1,800 residents and a few small businesses are scattered throughout the Reservation, as well as Harrah's Resort Southern California which includes a 1,065 room, two 21-story hotel towers, an events center, and a gaming casino with 8 associated restaurants, a spa, and parking for patrons.

- The historic and current land uses surrounding the Reservation include agricultural, residential, and gaming, along with a small amount of light industrial.

# Past Activities

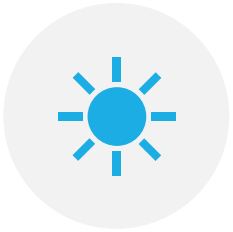
- 1 MW of solar at Harrah's Resort Southern California (HRSC) (2009)
- STEM Li-Ion BESS installed at HRSC (2018)
- Various energy efficiency measures installed at HRSC
- Rincon Energy Study and Strategic Energy and Resiliency Plan (2017-2019)
- Electric Vehicle Charging Stations

# Project Objectives

**INCREASE RESILIENCE**

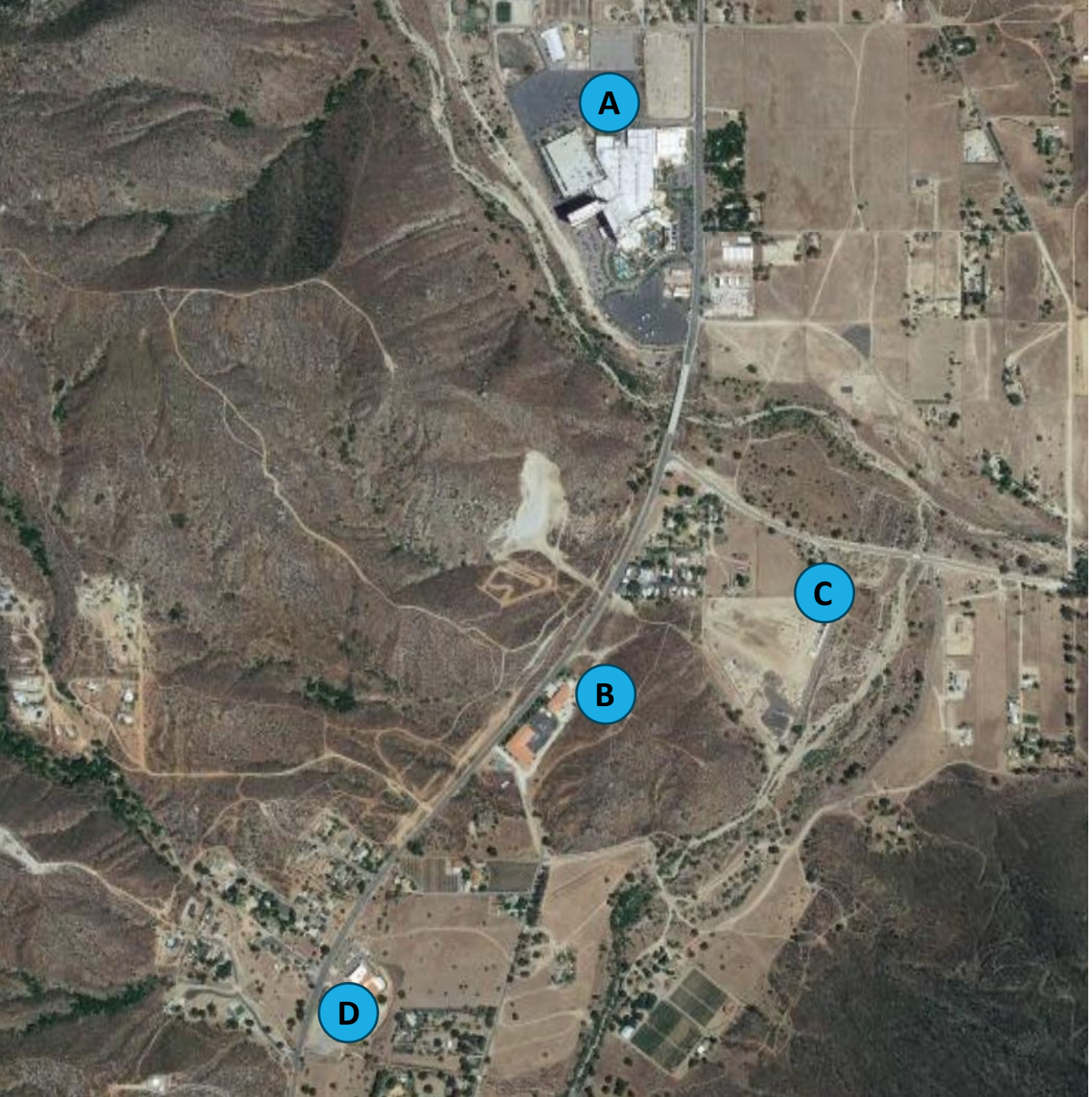
**LOWER ENERGY COSTS**

**ENERGY INDEPENDENCE**



**CLEAN ENERGY**

**SCALABILITY**

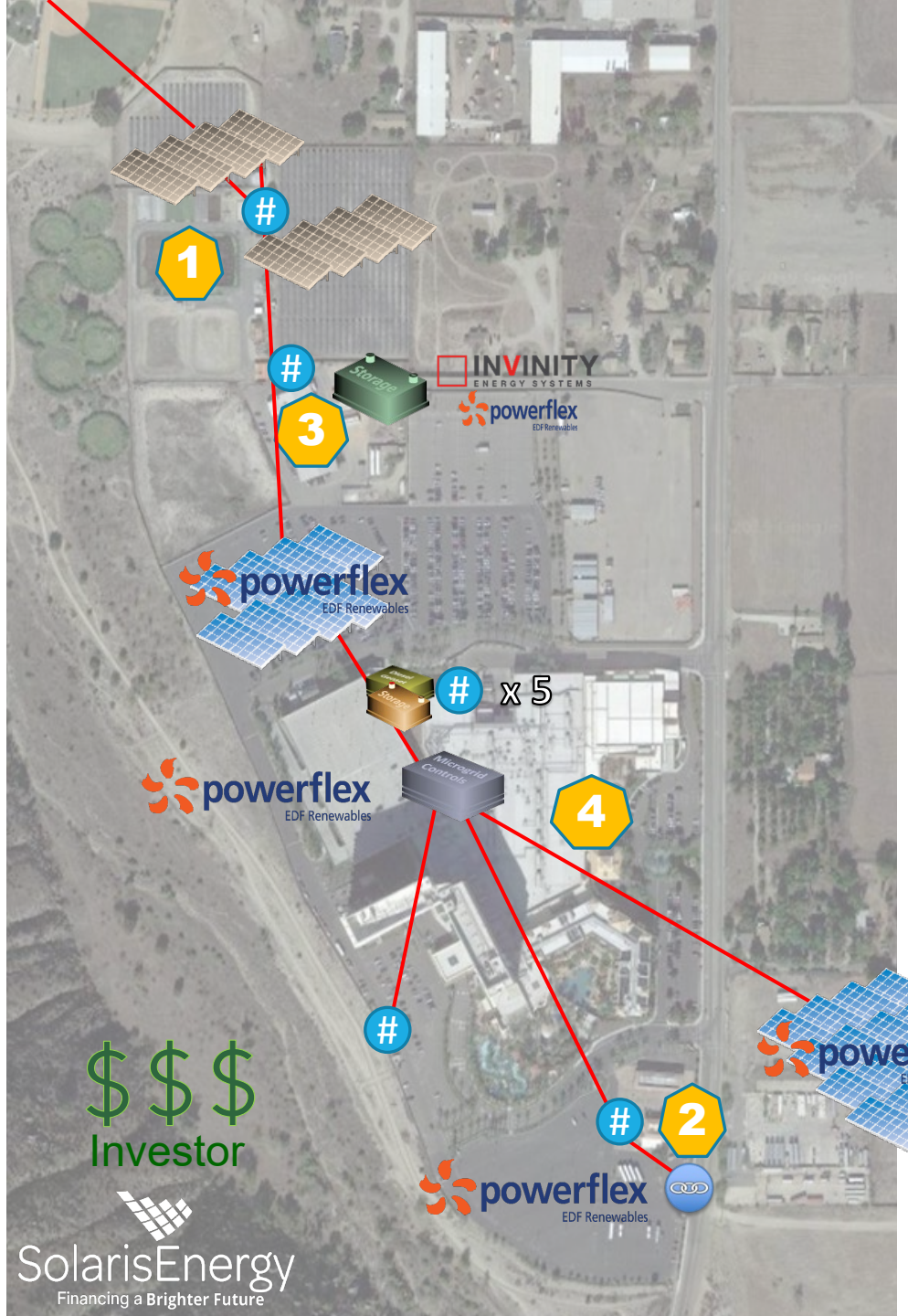



# Rincon Solar+Storage Microgrid Sites

- **A** Harrah's Chiller Plant Microgrid
- **B** Rincon Fire Station Microgrid
- **C** PC4 Well Microgrid
- **D** Rincon Government Center Microgrid

# Protecting Essential Facilities

| System | Facility Details | Type | Essential Purposes | Resource Type and Capacity |
|---|---|---|---|---|
| **Fire Station Microgrid** | 13,600 ft2, built in 2006 | Residential fire station, 911 emergency dispatch center, and EOC | Fire protection, rescue, and 911 emergency dispatch for the Rincon Reservation and neighboring communities through mutual aid agreements. | 81 kW Carport PV (new)<br>420 kW Diesel Genset (existing)<br>50 kW / 132 kWh Li-Ion BESS (new) |
| **PC-4 Well** | Public Water System | Water Well Pump | Provide domestic water for community homes and facilities | ~63 kW Carport/Ground-Mount PV<br>60 kW / 132 kWh Li-Ion BESS |
| **Resort Area Microgrid** | Resort: 1,284,619 $ft^2$, built in phases starting in 2001 | - Tribally owned casino-resort | Emergency public shelter, cooling center, emergency operations center (EOC), and emergency response and evacuation staging areas | 1 MW Groundmount PV (existing)<br>Carport PV ~1.3 MW (new)<br>Flow Battery 1 MW / 4 MWh (new) |
| **Rincon Government Center** | 143,000 $ft_2$, built in 2018 | Tribal Government Center, Tribal Police Station | Tribal police, first response, emergency public shelter, emergency operations management, EV charging | ~330 kW Carport/Rooftop PV (new)<br>250 kW Diesel Genset (replacement)<br>174 kW / 696 kWh Li-Ion BESS (new) |




# Original HRSC Microgrid Project

*Not part of DOE project scope or budget for grant or match share

1. Wastewater Treatment Plant and Well Pump(s)
2. Travel Center Gas Station and C-Store
3. Butler Building
4. Harrah's Resort Southern California

6 MW Solar PV System (new) powerflex EDF Renewables

1 MW Solar PV System (existing)

4.8 MWh Flow Battery System (new) INVINITY ENERGY SYSTEMS

4.8 MWh Flywheel Energy Storage (new) AMBER KINETICS

Lithium-Ion Batteries* (4.5 MW/2-hr new, 420 kW/680 kWh existing) powerflex EDF Renewables

Diesel Gensets* (4 MW new, 2 MW existing) powerflex EDF Renewables

Microgrid Controls (new) powerflex EDF Renewables

Point of Interconnection (new) powerflex EDF Renewables

Meters (existing)

Microgrid Underground Bus (new) powerflex EDF Renewables


# HRSC Solar+Storage Project V2

1. ~~Wastewater Treatment Plant and Well Pump(s) (1)~~
2. ~~Travel Center Gas Station and C-Store (2)~~
3. ~~Butler Building (3)~~
4. Harrah's Resort Southern California (4)

~1.3~~6~~ MW Solar PV System (new) powerflex EDF Renewables

~~1 MW Solar PV System (existing)~~

~~4.8~~4 MWh Flow Battery System (new) INVINITY ENERGY SYSTEMS

~~4.8 MWh Flywheel Energy Storage (new)~~ AMBER KINETICS

~~Lithium-Ion Batteries (4.5 MW/2-hr new, 420 kW/680 kWh existing)~~ powerflex EDF Renewables

~~Diesel Gensets (4 MW new, 2 MW existing)~~ powerflex EDF Renewables

Microgrid Controls (new) powerflex EDF Renewables

Point of Interconnection (new) powerflex EDF Renewables

Meters (existing)

Microgrid Underground Bus (new) powerflex EDF Renewables


# Harrah's Resort Chiller Plant Solar+Storage Microgrid

## Overview

- 1.33 MW Solar PV System
- 1 MW Solar PV System (existing)
- 1.4 MW/4 MWh Flow Battery System

## Benefits

- ~2.3 GWh generated/year
- ~$508k energy costs saved (Year 1)
- ~3 hrs. of backup power

## Status

Currently in 90% design
Expected PTO: 4Q 2025

# Rincon Government Center Microgrid

## Overview

331.7 kW Solar PV Carports

174 kW/696 kWh Li-ion BESS

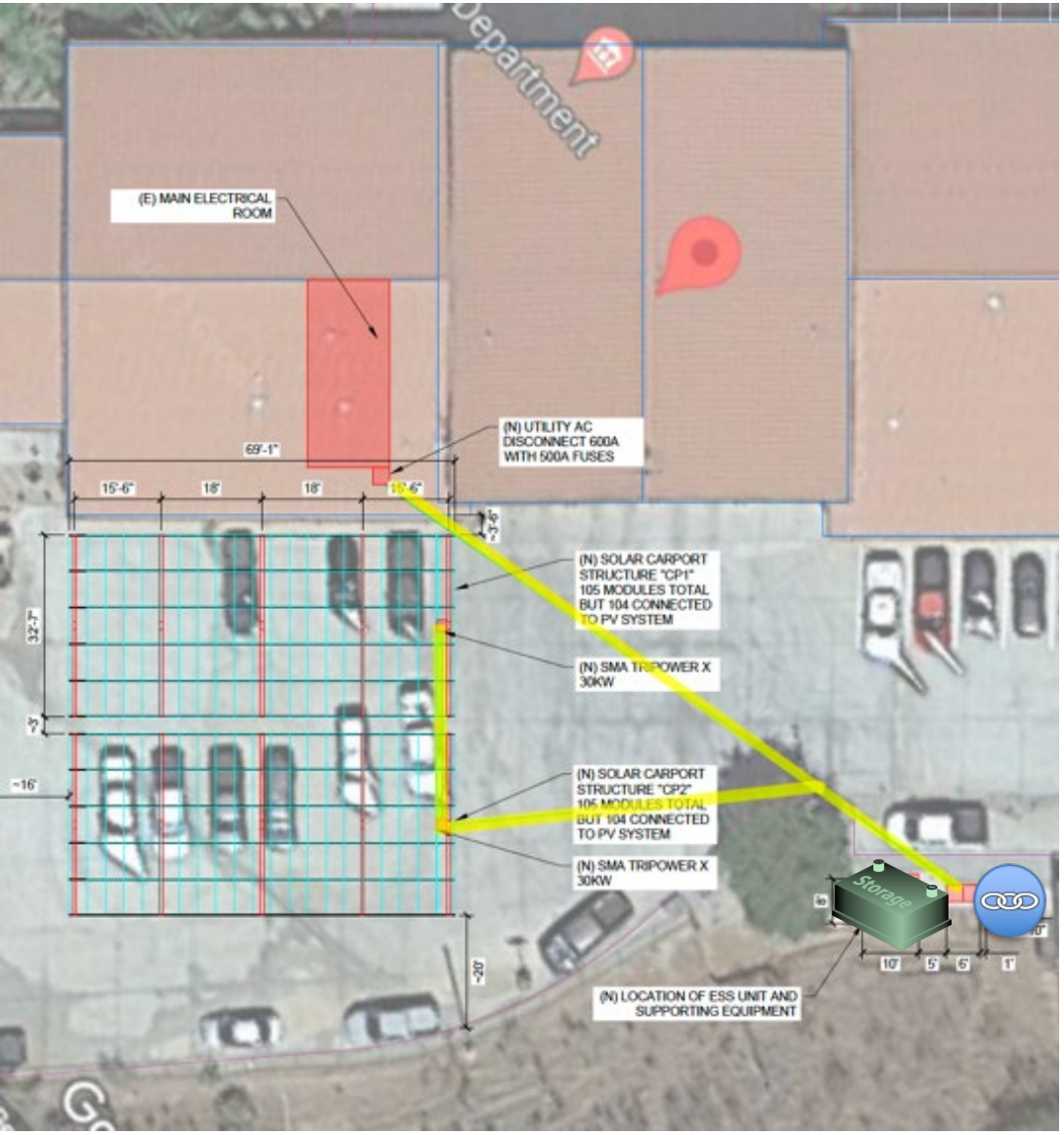
## Benefits

- ~578 GWh generated/year
- ~$196k saved per year
- 4 hrs. peak load backup

## Status

Currently in 90% design

Expected PTO: 4Q 2024




# Fire Station Microgrid

## Overview

79 kW Solar PV System

60 kW/132 kWh Li-ion Battery System

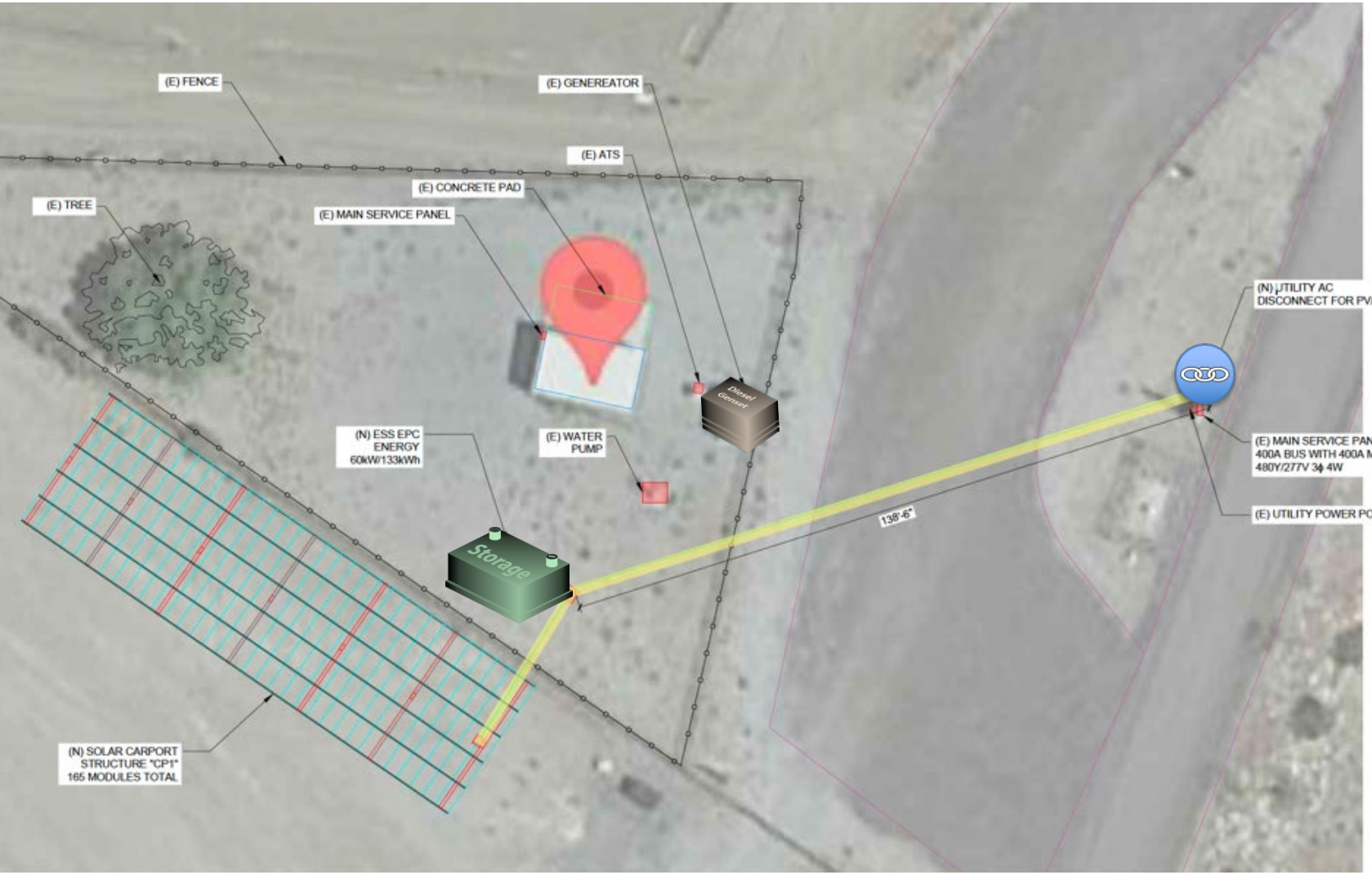
## Benefits

- ~139 MWh generated/year
- ~$42k saved per year
- 2+ hrs. of backup power

## Status

Currently in 50% design

Expected PTO: 4Q 2024




# PC-4 Well Microgrid

## Overview

~63 kW Solar PV System

60 kW / 132 kWh Battery Energy Storage System

## Benefits

- ~114 MWh generated/year
- ~$24k saved per year
- 2+ hrs. of backup power

## Status

Currently in 50% design

Expected PTO: 4Q 2024

# Solar Module Deliveries – May 2023

Rincon Band accepted delivery of solar PV modules for both the Resort-Area Microgrid and the Government site microgrids (Government Center, PC4 Well, and Fire Station) in early May 2023.



- 2,497 JA Solar Modules
- 1,260 Canadian Solar Modules

The solar modules are being stored at the Rincon Reservation in secure mobile containers

# Microgrids Project Partners

| Prime Recipient / Site Owner | EPCs and Technology Providers |
|---|---|
| Rincon Band of Luiseño Indians | powerflex EDF Renewables; INVINITY ENERGY SYSTEMS; ELITE ELECTRIC, INC. |
| **Project Mgmt/Owner's Reps** | **Financing Partners** |
| Prosper Sustainably; Microgrid Institute; GODFREY KAHN S.C.; OURENERGY; SolarisEnergy; WATTMORE | BRIDGE RENEWABLE ENERGY |

# Project Status & Accomplishments

| ACTIVITY |
| --- |
| 1. Select design build contractors and financier (completed) |
| 2. Negotiate and finalize EPC & financing agreements (completed) |
| 3. Complete engineering design and permitting (in progress) |
| 4. Complete project equipment procurements, construction, commissioning, and deployment (in progress) |
| 5. Negotiate and finalize O&M agreements (in progress) |
| 6. Operations & Maintenance, Performance Monitoring and Reporting |

# Challenges and Lessons Learned

- **Microgrid projects can be extra complex**
  - Larger systems, more meters/loads and DERs → more complex
  - Abundance of technology providers, considerations, and approaches
  - Be prepared for changes as you progress (in understanding, conditions, costs)
- **Be ultra conservative with budget and schedule estimates**
  - Higher than anticipated electrical infrastructure, DER, and transaction costs
- **Procurement, negotiating contracts can be challenging, take time**
  - Consider design bid build (two contracts, different contractors) versus design build (single contractor)
- **Initiate interconnection applications and studies ASAP**
- **Continually model project outcomes as conditions change and provide regular cost-benefit analyses to Tribal leadership**

# Challenges and Lessons Learned

- Get O&M cost estimates, include in cash flows, secure contract
- Existing building and electrical plans/information may be limited
- Rooftop or other solar may not be feasible or require extra analysis
- Existing energy assets may have limited to no compatibility w/ microgrid (e.g. backup generators, solar)
- Expect long equipment lead times, particularly for switchgear
- Unclear utility planning, interconnection, and approval processes and timelines; Press utility clarify and streamline requirements
- Missing BIA easements for utility infrastructure, obtaining new easements

# Challenges and Lessons Learned

- **Project finance opportunities, challenges**
  - MSA/PPA with 100% Tribal ownership using ITC Tribal Elective Pay option
- **Tribe as AHJ may not have clear approvals processes**
- **Clear design, plan set review processes protect Tribe (as Owner)**
- **Developers, equipment supplies, and other companies can fail**
  - Ensure there are terms & conditions to protect Tribe in contracts
- **Negotiating, designing, building, and operating complex energy systems is a capacity challenge for Tribes requiring expert support**
- **SCTCA' Tribal Energy & Climate Collaborative partnership and knowledge sharing is benefiting Rincon and 24 Member Tribes**

# THANK YOU! QUESTIONS?

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