Rincon Solar Microgrids

NOVEMBER 15, 2022

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

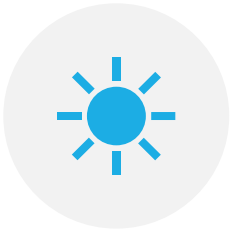
- 1 MW of solar at Harrah's Resort Southern California (HRSC) (2009)
- STEM Li-Ion BESS installed at HRSC (2018)
- Various energy efficiency measures installed at HRSC
- Rincon Energy Study and Strategic Energy and Resiliency Plan (2017-2019)
- Electric Vehicle Charging Stations

Project Objectives

INCREASE RESILIENCE

LOWER ENERGY COSTS

ENERGY INDEPENDENCE



CLEAN ENERGY

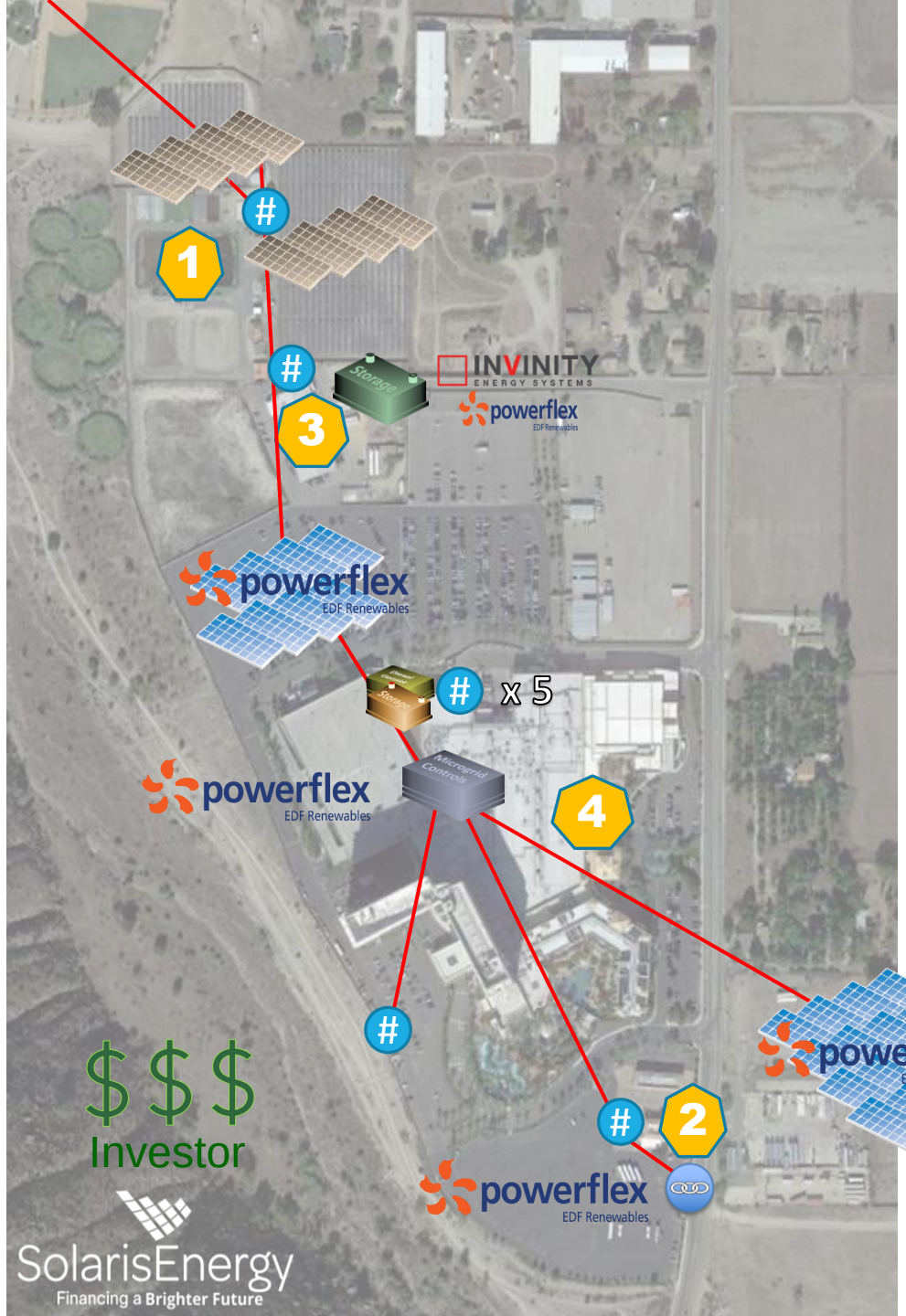
SCALABILITY

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.	Carport PV 81 kW (new) Diesel 420 kW (existing) Li-Ion BESS 50 kW / 132 kWh (new)
PC-4 Well	Public Water System	Water Well Pump	Provide domestic water for community homes and facilities	Carport/Ground-Mount PV ~63 kW Li-Ion BESS 60 kW / 132 kWh
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	Carport PV ~2 MW Flow Battery 1 MW / 4 MWh
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	Carport/Rooftop PV ~333 kW (new) Diesel Genset 150 kW (existing) Li-Ion BESS 174 kW / 696 kWh (new)

Original HRSC Microgrid Project

*Not part of CEC 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~~ MW Solar PV System (new) powerflex EDF Renewables

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

~~4.8~~4.0 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

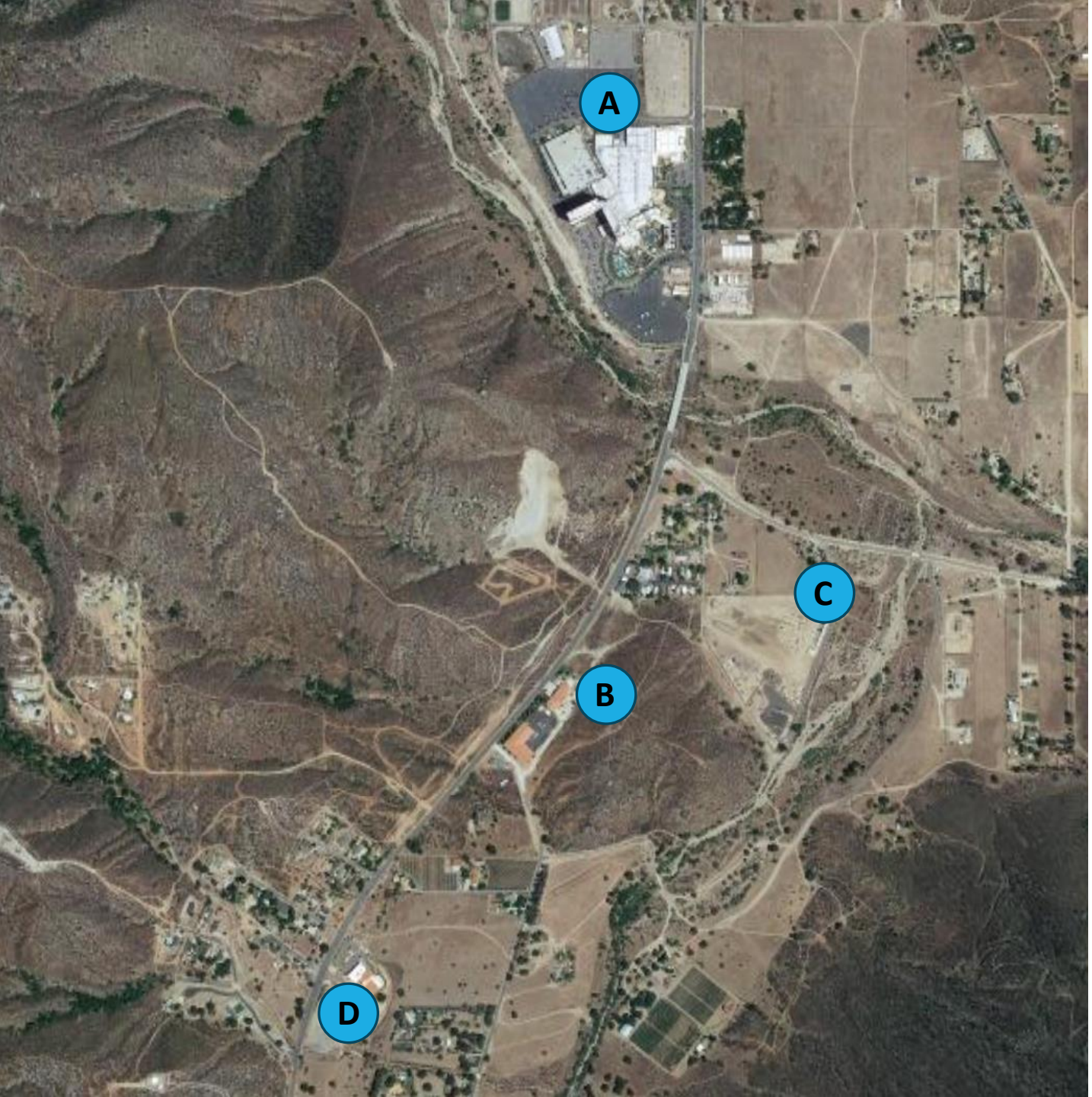
Diesel Gensets (~~4 MW new~~, 1~~2~~ MW existing) powerflex EDF Renewables

Microgrid Controls (new) powerflex EDF Renewables

Point of Interconnection (new) powerflex EDF Renewables

Meters (existing)

Microgrid Underground Bus (new) powerflex EDF Renewables



Rincon Solar+Storage Microgrid Sites

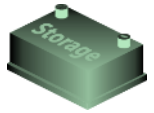
- **A** Harrah's Resort-Area Microgrid
- **B** Rincon Fire Station Microgrid
- **C** PC4 Well Microgrid
- **D** Rincon Government Center Microgrid

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 60% design

Expected PTO: 4Q 2025

Rincon Government Center Microgrid

Overview

331.7 kW Solar PV Carports

174 kW/696 kWh Li-ion BESS

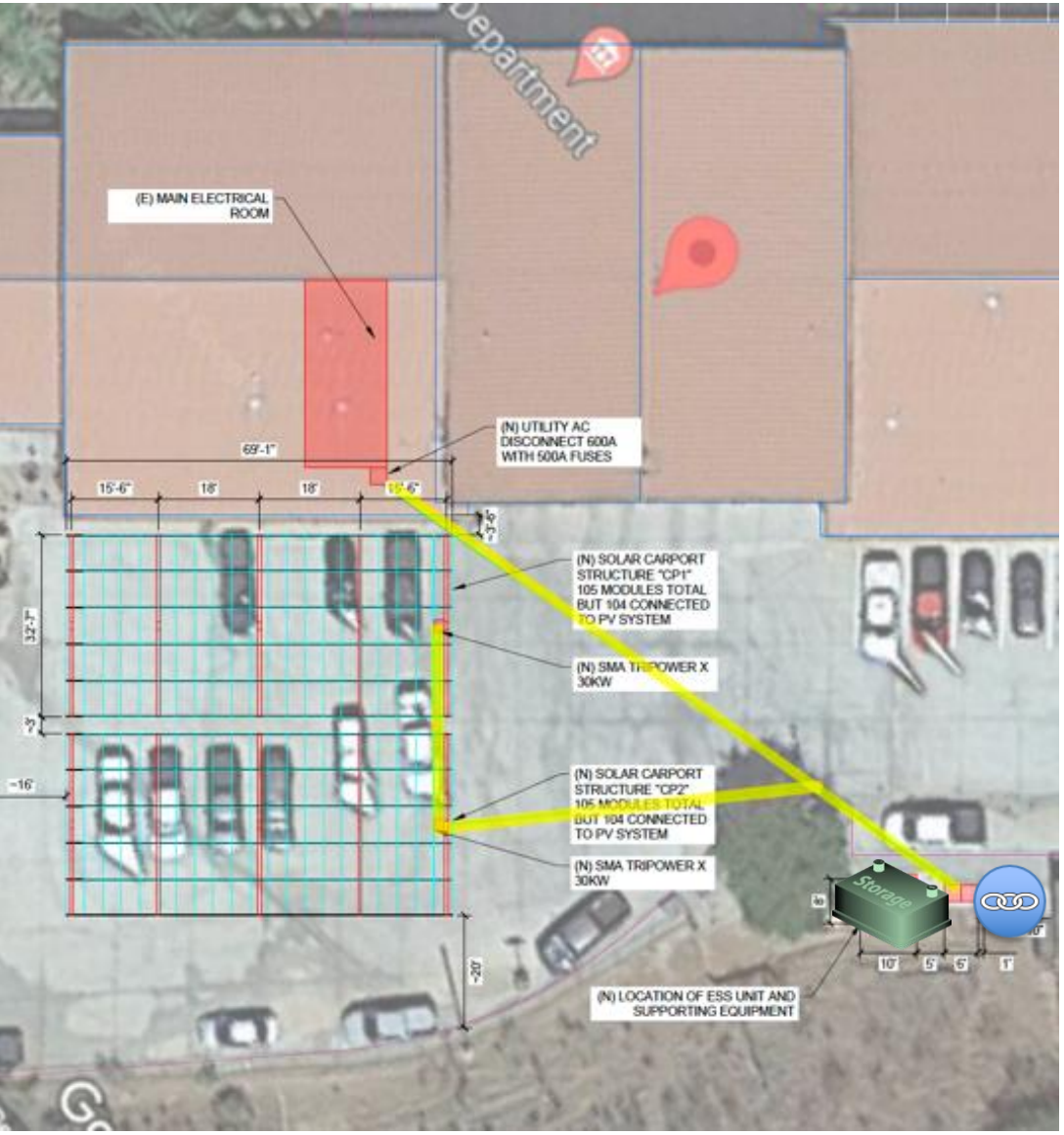
Benefits

- ~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

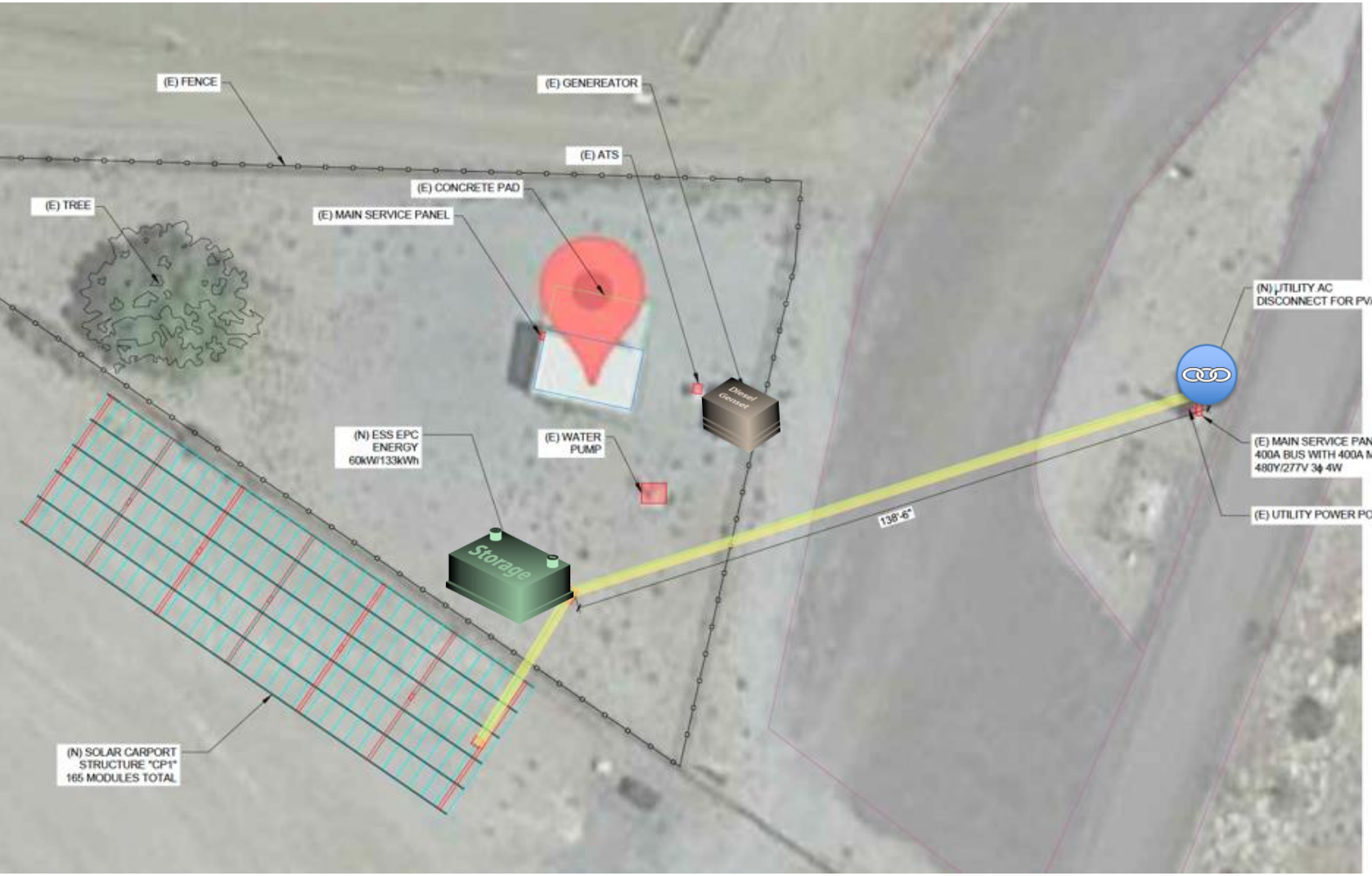
Benefits

- ~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.

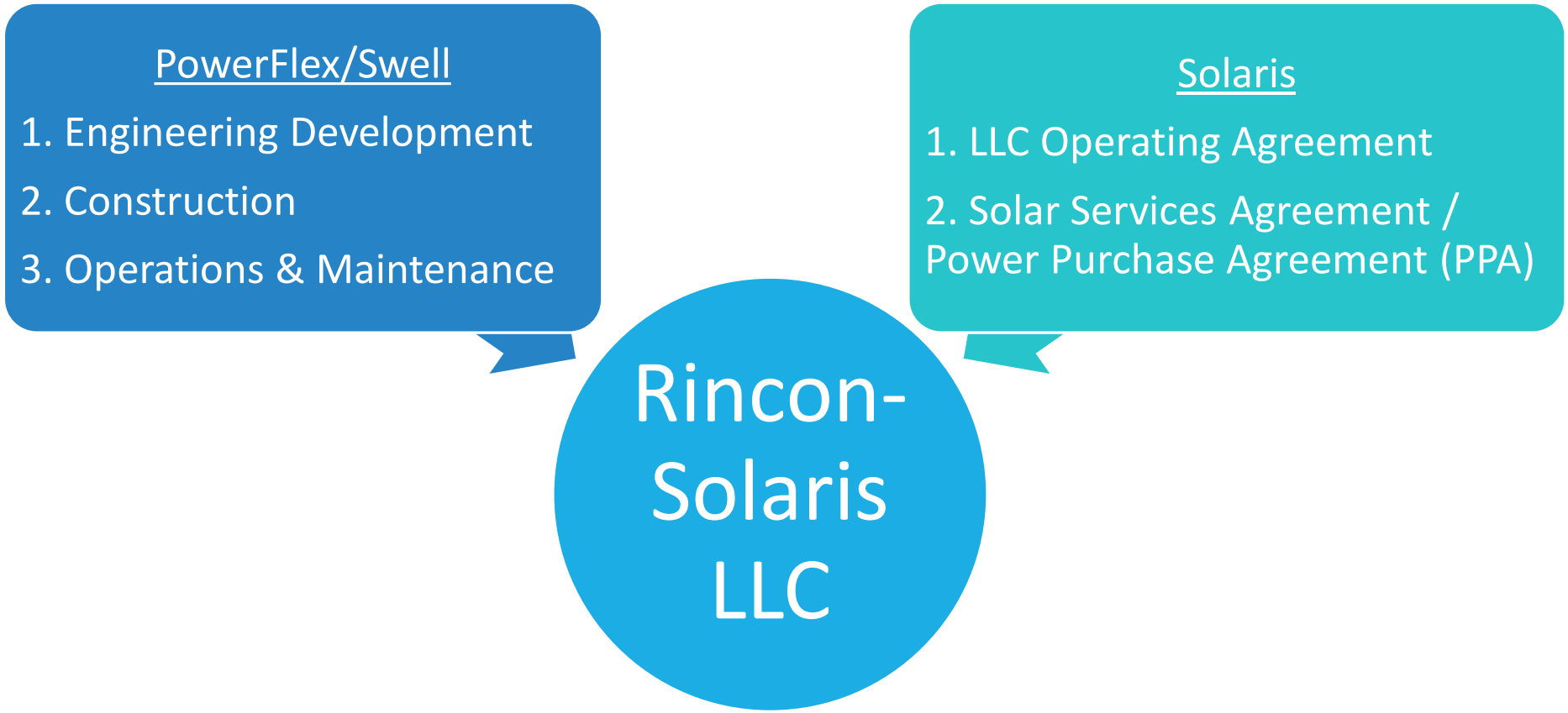
- 2,497 JA Solar Modules
- 1,260 Canadian Solar Modules

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 Est. 1875 Vision Unity Perseverance	powerflex EDF Renewables INVINITY ENERGY SYSTEMS swell
Project Mgmt/Owner's Reps	**Financing Partners**
Prosper Sustainably Microgrid Institute GODFREY KAHN S.C. OURENERGY	SolarisEnergy Nikola Power

Microgrid Project Agreements



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. Operations & Maintenance, Performance Monitoring and Reporting

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 and conditions)
- **Consider design bid build (two contracts, different contractors) versus design build (single contractor)**
- **Existing building and electrical plans/information may be limited**
- **Rooftop solar may not be feasible (or require extra analysis)**
- **Existing energy assets may not be compatible w/ microgrid (e.g. backup generators)**

Lessons Learned

- **Be ultra conservative with budget and time estimates**
  - Higher than anticipated electrical infrastructure, DER, and transaction costs
- **Initiate interconnection applications and studies ASAP**
- **Continually model project outcomes as conditions change and provide regular cost-benefit analyses to Tribal leadership**
- **Get O&M cost estimates, include in cash flows, and contract**
- **Negotiating, designing, and building complex energy systems is a significant tribal capacity challenge requiring expert support**
- **Tax equity financing opportunities and challenges**

THANK YOU! QUESTIONS?

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