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MEMBERSHIP | ENERGY | SAFETY

Project SOLARBE

**On-Campus Solar Plus Battery (Phase I)
Microgrid (Phase II)**

October 6, 2020

We are **UNIQUE**

Put People First. Stay Safe. Innovate. Own It.

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First cooperative in Georgia to have an on-campus solar/battery storage system

Largest EMC in the nation (in revenue)

7th largest EMC in the nation (in members)

Largest EMC solar offering east of the Mississippi

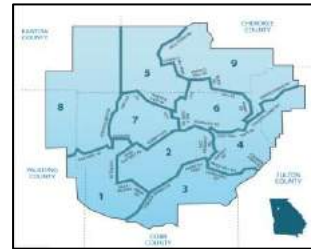
3rd most reliable utility in the nation

1st utility in the nation to offer free overnight home charging for EVs

Owns Gas South -3rd largest gas marketer in GA/FL

600 Employees

500K Customers (200K Electric, 300K Natural Gas)



9 Districts
9,000 Miles of Lines
432 Square Miles



47 Substations
198 Feeders



206,000 Meters
92% Residential
8% C&I



Solar PV (Rooftop + Car Canopy)

1.85 MW DC / 2.4 GWh Annual

Battery Energy Storage System

1.0 MW / 4 MWh (AC)

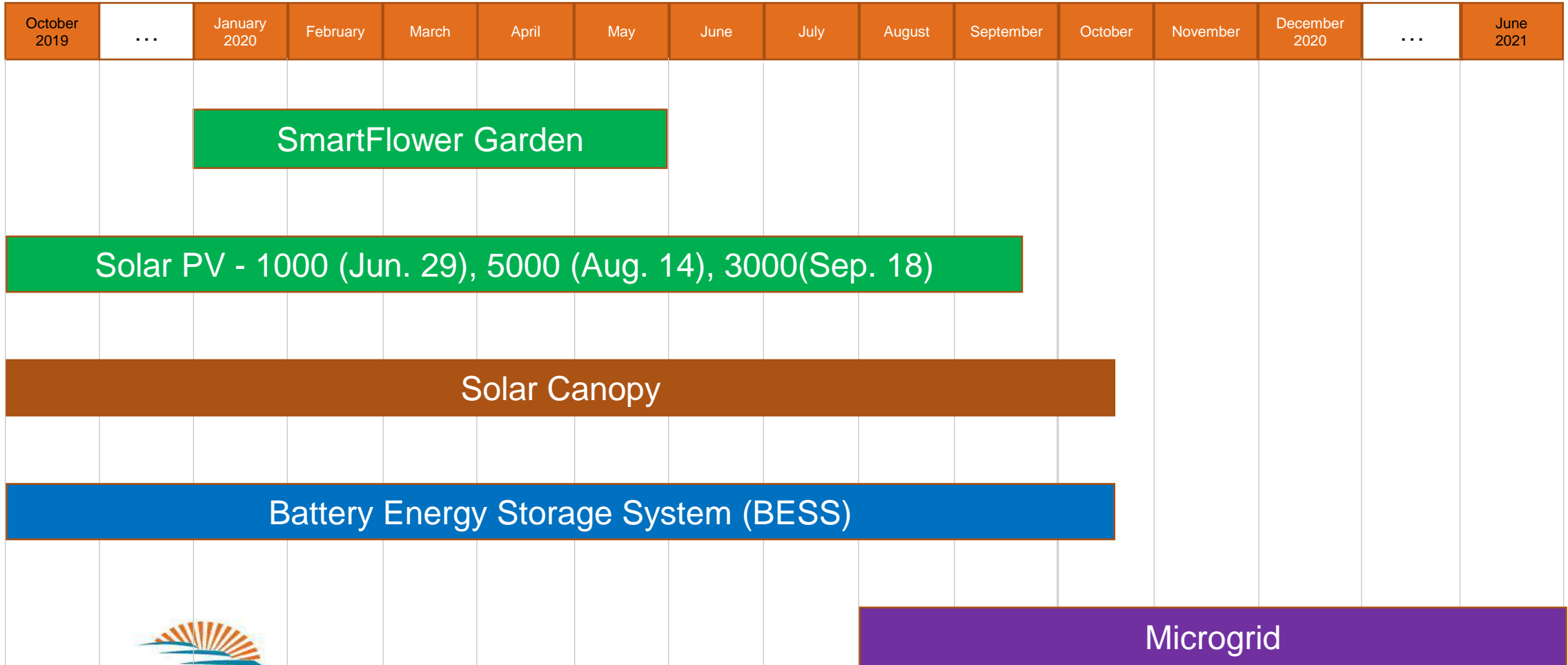
SmartFlower Garden

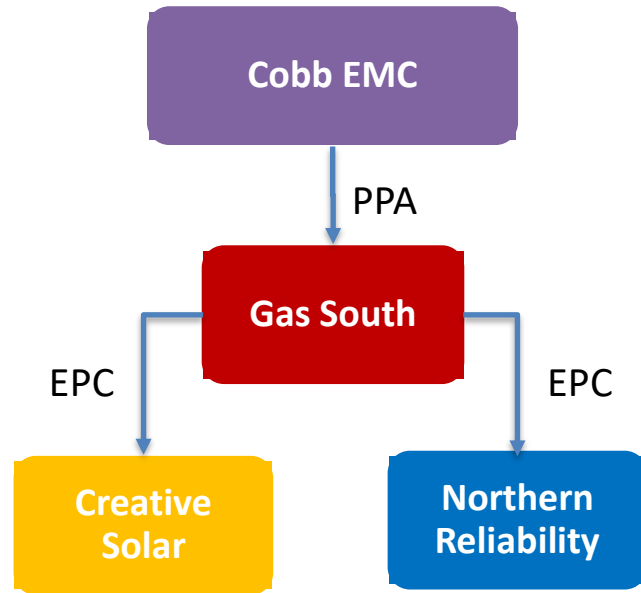
10 KW / 2.4 MWh Annual

Microgrid (Solar PV + BESS + Genset)

Project Timeline

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- Cobb EMC pays Gas South
 - ✓ A fixed capacity rate for the BESS (\$/MW)
 - ✓ Volumetric rate for the Solar
- PPA structure is modeled as a Fair Market Value structure
- This structure allowed for the benefits of Federal Investment Tax credit

Value Proposition
to Cobb EMC and
its Members



Peak Shaving



Microgrid



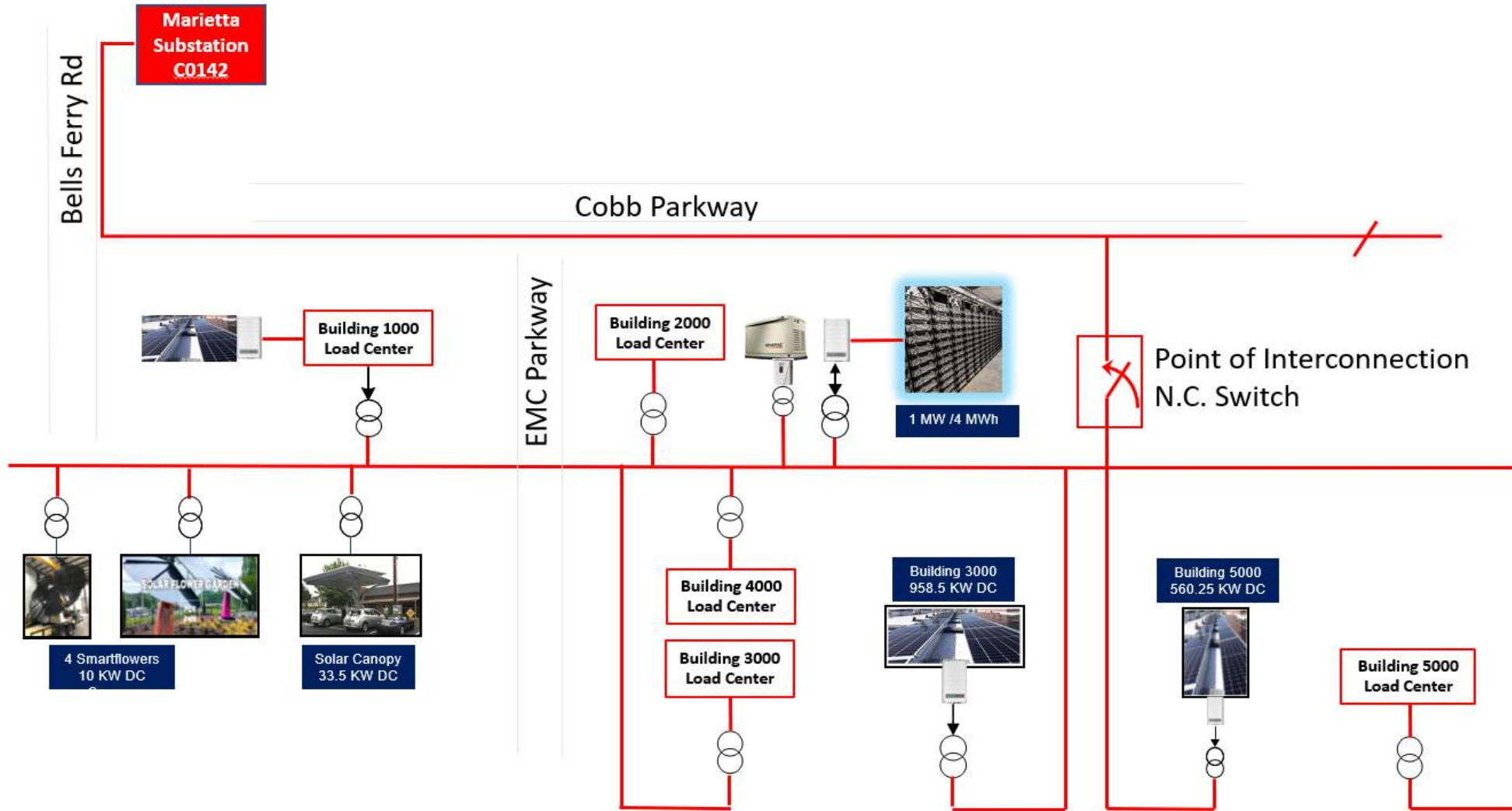
Research Project



Greener Outlook

Campus Oneline

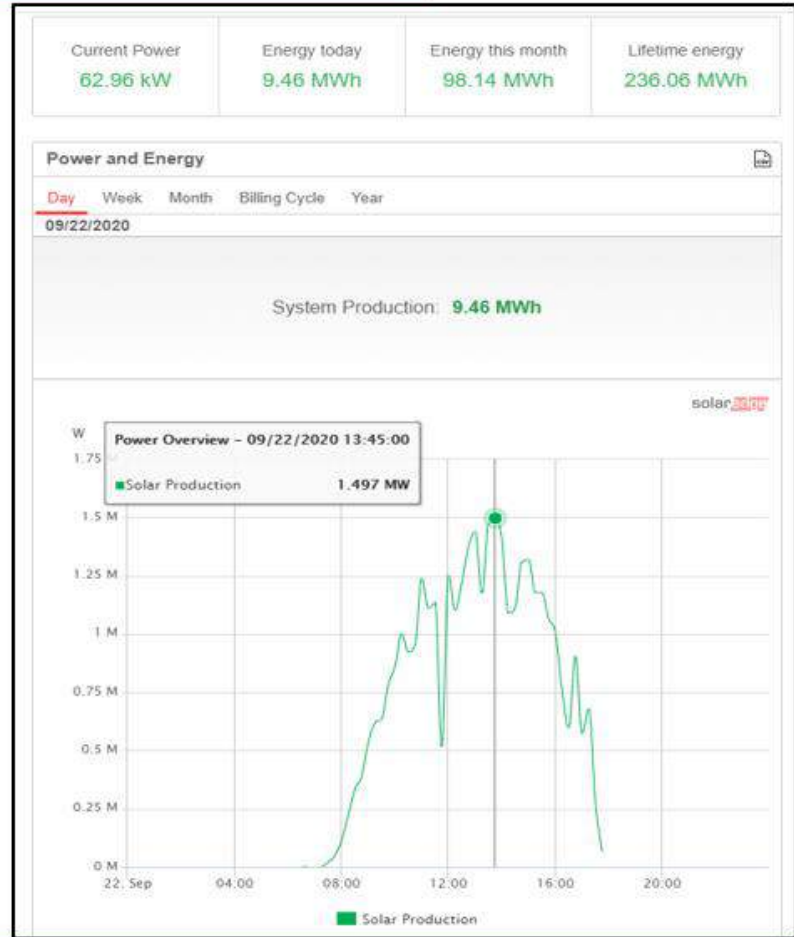
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Building 1000/3000/5000 and Smartflowers are Operational

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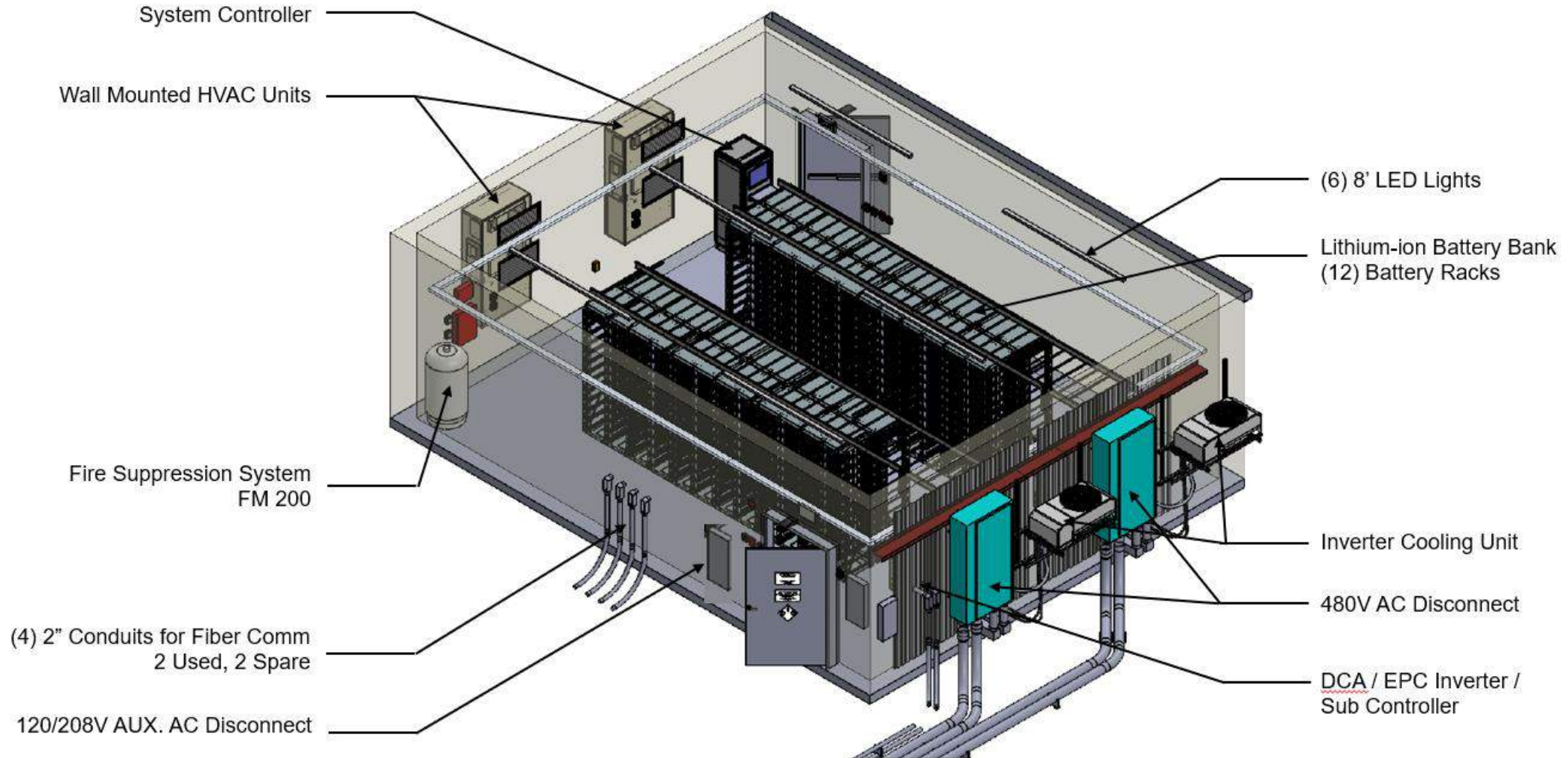


Met Performance Goal Criteria of 1.5 MW AC

COBB COUNTY
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BESS Main System Components

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BESS Building

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Battery Modules and Racking

Manufacturer/Model: Samsung / Mega E2

Battery Chemistry: Lithium Nickel Manganese
Cobalt (NMC)

C-Rating: C/4

Inverters: EPC Power PD 500 kW

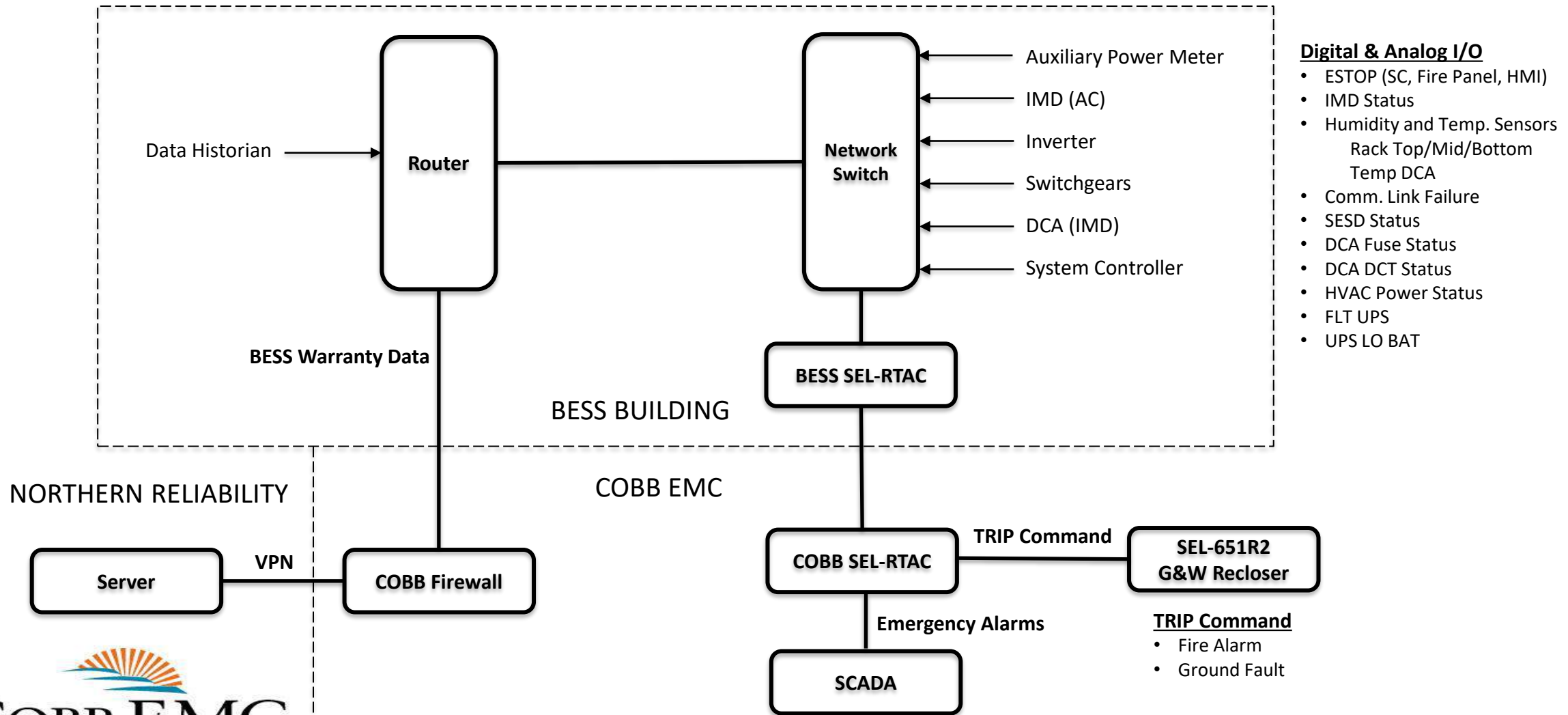


Racking Configuration is 13 x 2 and the top section is used for mounting Switchgear

- 12 Dual Racks
- 2 Strings / Rack
- 12 Modules / String
- Total Modules / Subsystem
 $12 \times 2 \times 12 = 288$
- Total Number of Modules
 $288 \times 2 = 576$

BESS Safety Circuits and Network Communications

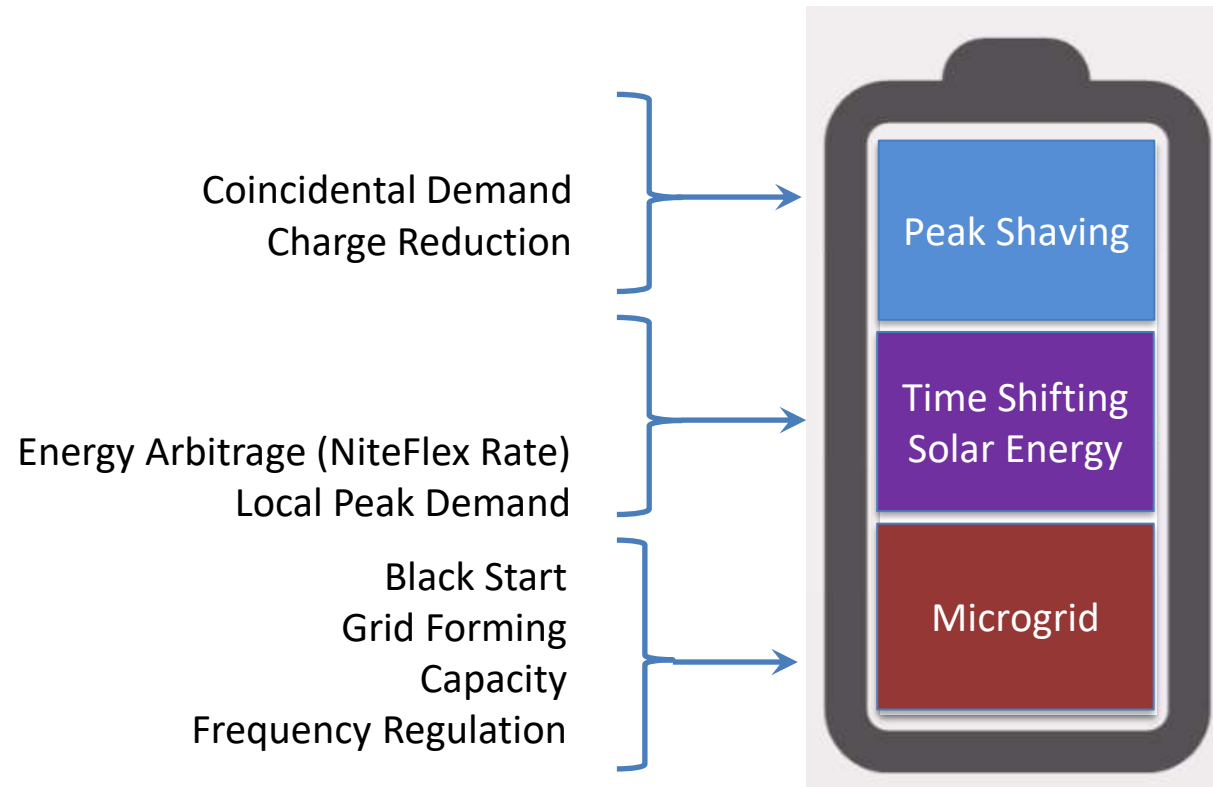
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- Temperature
 - Too much heat/cold is not good
- State of Charge
 - Average monthly rSOC
 - Average monthly cSOC
- State of Discharge
 - DoD
 - Rate of Discharge
- Type of Application

Value Stacking of Battery Storage

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- **Increase Resiliency To Campus**
- **Build a Model For The Future Microgrid Projects**
- **Learning Platform To Evaluate Technology**
- **Attract critical customers such as Data Centers for future load growth**

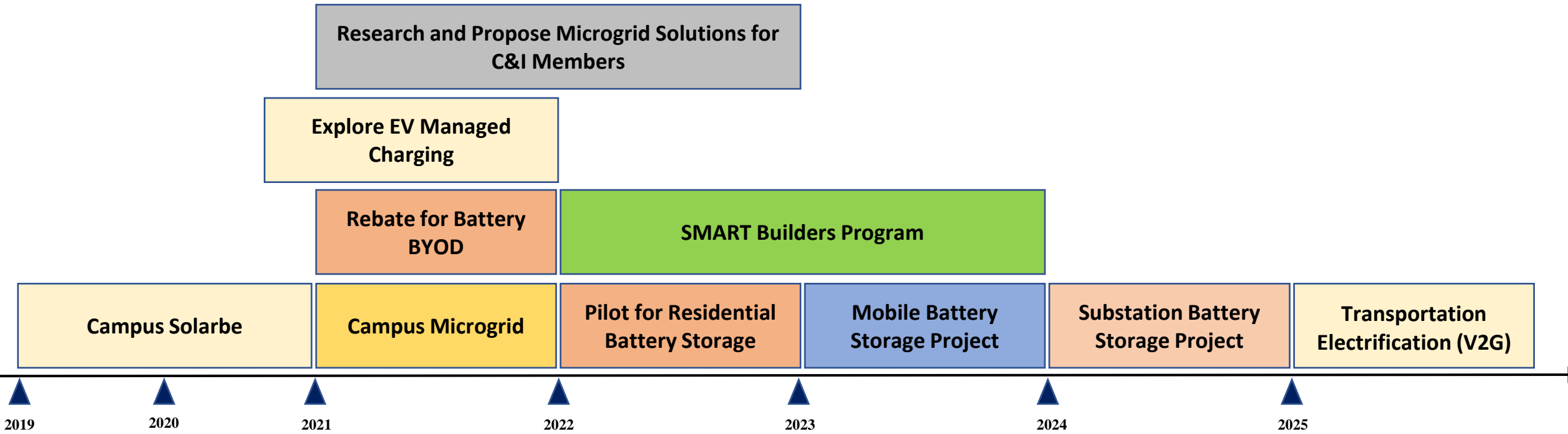
Key Takeaway...

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- **Battery Sizing**
 - Oversize or undersize?
 - Will it meet your goals?
 - Use cases – Peak shaving, islanding, ancillary services, grid forming?
 - Load profile – Are you managing one location or the entire feeder?
- **Cost**
 - Battery and BOS
 - AC or DC coupling?
 - Interconnection
 - Point of Common Coupling?
 - Metering
 - O&M
- **Permits, COVID-19**
- **Performance**
 - Understanding your use cases
 - Degradation curve
 - Performance guarantee - #cycles, capacity, downtime
 - One-way efficiency, roundtrip efficiency, DC efficiency?
 - Design capacity v/s usable capacity?
- **Engineering Study & Design Considerations**
 - DER impact study and system protection study
 - Sizing of the interconnection transformer
 - Ground fault protection
 - Auxiliary transformer on different feeder (HVAC)
- **Safety**
 - Safety mechanism built in the design
 - SCADA interface, emergency alarms
 - Automation for isolation
 - Emergency Action Plan

5-Year DER Roadmap

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