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Scaling Solar+ for Small and Medium Commercial Buildings
Funded primarily by California Energy Commission (EPC-17-002)

Core project partners:
Schatz Energy Research Center / Humboldt State U.
Lawrence Berkeley National Lab (software and controls)
Blue Lake Rancheria (site host and logistics)
Scaling Solar+ for Small and Medium Commercial Buildings

Working towards streamlined design, lower cost hardware, and open source software for microgrids.

Key specifications for system hardware (all sub-metered 3-phase power):

**PV Capacity:** 60 kW DC

**Battery Capacity:** 109 kW / 174 kWh

**Load Controls:**
- 2x Communicating thermostats controlling rooftop AC Units
- 2x Communicating refrigeration controllers for Ref / Freeze

**Building Loads:**
Overall load average ~40 kW
(significant fraction is on-site gaming machines).

Note: No EV charging is present at pilot project site currently.
Scaling Solar+ for Small and Medium Commercial Buildings

Project timeline

Q2 2019: Complete final design and procurement
Q3 2019: Complete installation and commissioning
Q3 - Q4 ‘19: Operational testing***
Q1 - Q2 ‘20: Continue monitoring and write reports

***Tariffs and operational strategies we plan to investigate:

1) Showing that the **MPC-controlled building is grid responsive**, through traditional DR programs:
   - E19S TOU tariff
   - Incentive-based DR (Load shedding for 4-hr)

2) Investigating **new DR directions** by leveraging the advanced capacities of MPC-building
   - Enhanced TOU tariffs (higher price ratios)
   - Real Time Pricing (based on Day-ahead pricing)
   - Building load profile prediction and tracking (aim for target load shape)
What is the value proposition for Solar+ at the SMB Scale?

Our work is focused on driving down the integration costs for Solar+ with low-cost hardware and software. The goal is to unlock potential value at small and medium scale sites with high potential for replication (12,000 gas stations in CA, etc.)

Value of Solar+ is a combination of:

- **“Blue Sky” bill savings value** (available today): Generate PV to serve load, DR / dynamic pricing.

- **“Blue Sky” distribution system value** (future?): defer or avoid distribution system upgrade needs.

- **“Black Sky” resilience value** (growing need): Zero-carbon reliable power at critical sites. BIG UNCERTAINTY in value for resilience.