DOCKETED	
Docket Number:	19-MISC-04
Project Title:	Modeling Tool to Maximize Solar + Storage Benefits
TN #:	229427
Document Title:	Humboldt State Workshop Slidedeck
Description:	N/A
Filer:	Liet Le
Organization:	California Energy Commission
Submitter Role:	Energy Commission
Submission Date:	8/15/2019 10:38:23 AM
Docketed Date:	8/15/2019

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

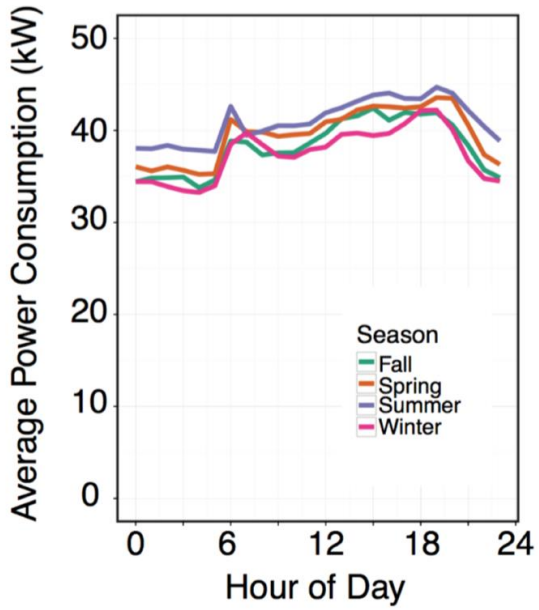
Key specifications for system hardware (all sub-metered 3-phase power):

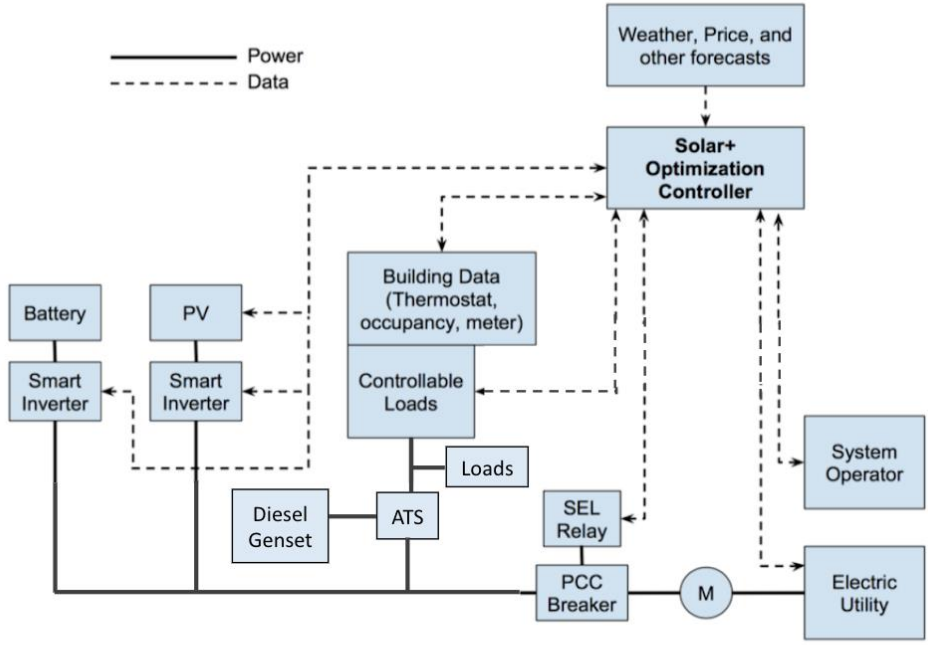
PV Capacity: 60 kW DC

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).

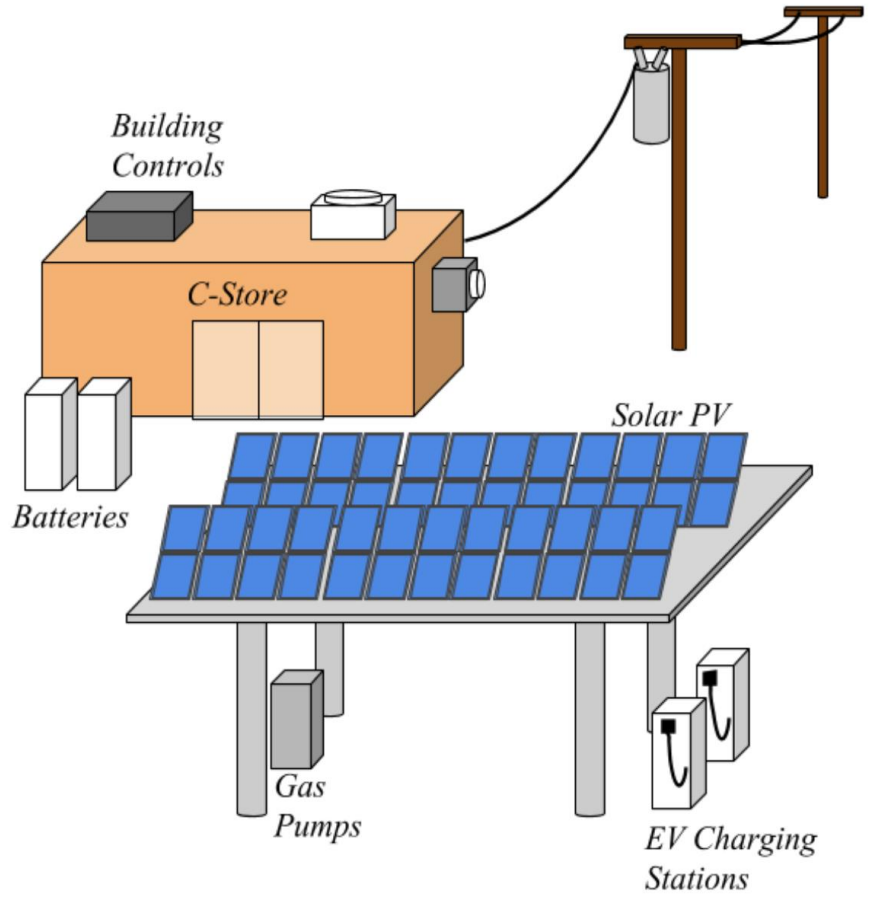




Simplified 1-line diagram for pilot project

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

Shown below: Conceptual illustration of possible future “Solar+” fueling station



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

<u>*Tariffs and operational strategies we plan to investigate:</u>**

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.

Residents in Williams Lake line-up to get gasoline in smokey conditions in the days leading up to the evacuation order. Officials estimate up to half of the city left before that order came. (Simon Hergott)
https://www.cbc.ca/news/canada/british-columbia/bc-fire-saturday-1.4206967