Advanced Microgrid Solutions

Behind the Meter
Energy Storage Applications
&
Solutions Design
A window into the Resiliency need around Goleta

A shortfall in energy supply / availability must be met with either:

1. Increases in local supply (e.g., regional or local generation)
2. Reduction in demand (e.g., regional or local curtailment)

Illustration 2: Goleta Resiliency MW/MWh Objective

For illustrative purposes only

2.41MW of ES charging ability (only in HEO3)

Approx. 1.385MWh of total need (across most hours)
Behind the Meter Storage = More Control for the Customer

**Lower** Demand and Energy Costs

**Control** energy consumption with no impact to operations

**Protect** against future rate increases

**Capitalize** on price volatility; **Monetize** your energy usage

![Graph showing power consumption and state of charge over time with labels for Energy Arbitrage, Load Management, and Load Shift/Demand Response.]
More Control over Costs

As Time of Use times change, storage provides a flexible solution.

Current SUMMER TOU: 12 – 6 pm, Weekdays June - September

Proposed Year Round TOU: 4 – 9 pm, Weekdays Year Round
More Control over Usage

Behind the Meter Energy Storage provides multiple load shaping services to save or earn money **with no operational changes**
Solutions Design by Advanced Microgrid Solutions

Ask not what a **battery** can do for you…

**Ask what you can do with a battery.**

Solutions Design helps you find not just the value of energy storage, but the value of your load.

Load Analysis of Value Potential:
1. Demand Management
2. Baseload (Utility Load Reduction)
3. Operational Inefficiency

Old Peak
New Peak
Solar ITC Charging
TOU Arbitrage

kW Peak Management
AMS Case Study 1: Water Treatment Plant
Existing Facility Load before Onsite Generation

Global Peak (June)
AMS Case Study 1: Water Treatment Plant
Modeled 280 kW Microturbine Operating Year-Round

New Global Peak (June)
AMS Case Study 1: Water Treatment Plant
Modeled 1 MW of New Solar in addition to microturbine

New Global Peak (June)

Solar is intermittent and does little to firmly reduce demand charges
AMS Case Study 1: Water Treatment Plant
Modeled incremental storage system w/ optimal size 1,000 kW | 6,000 kWh

New Global Peak (June)

Load Shaped to reduce both Global and TOU demand charges

Modeled participation in Utility Capacity Program, earning extra revenue at no operational cost

Total Modeled Net Savings to Customer: ~$100,000
AMS Case Study 2: University
Batteries + Solar modeled as complementary systems

- Solar output wanes in the afternoon, exactly when energy is most expensive.

- AMS designs solar & storage to complement each other. **Storage finishes what Solar Started.**

- AMS sizes storage systems to be large enough to hedge. When TOU periods begin to shift further outside daylight hours, **storage will drive all the TOU savings.**
AMS Case Study 3: Commercial Real Estate
Modeling Impact of Future Tariff Changes help find optimal system size

- Customer eligible to participate in Utility Product for SCE
- AMS Analytics modeled multiple potential tariff changes to assess impact on Host Customer Savings
- Energy Storage is remarkably resilient to tariff changes
Optimized Portfolio Dispatch for Grid Services

Solar operations are predictable
Battery operations must be determined.
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