Reinventing the grid with behind-the-meter storage

Will Fadrhonc, Grid Solutions, Stem, Inc.
Stem builds virtual power plants

Aggregating distributed storage is the fastest, cheapest, and cleanest way to solve grid-level capacity challenges.

Company highlights
- 30+ systems installed
- 9.0+ MW capacity signed
- Industry’s first storage finance agreement
- Certified per UL standards

36 kW PowerStore | San Jose, California
Light industrial
Energy storage value chain

- Demand-side management
- Application aggregator
- Supports distribution circuit
Why behind-the-meter?

Located in load centers
→ relieves local capacity constraints

Cheaper, faster, safer
→ no grid upgrades required
→ simple interconnection & permitting
→ low voltage means less risk

Customer participation without cost shift
→ allocating costs and benefits appropriately
Energy is cheap. Power is expensive

10-year trend for PG&E, SCE and SDG&E

Demand up 75%

Energy down 32%

Note: Tariffs calculated are PG&E E-19S, SCE GS-3 Option B, and SDG&E AL-TOU. Calculations represent weighted averages of time-of-use rates. Tariff data is publicly available from utilities. Endpoints are January 1, 2008 and May 1, 2013.

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Reducing peaks according to the tariff
Reducing peaks according to the tariff
Stem as a utility resource

Aggregated PowerStores act as a virtual power plant in periods of high system-wide demand

- Fast responding, local capacity
- Predictive software selects storage systems that will not be in use by the host customer
- Enables hedging against real-time wholesale price swings or fuel price spikes
- Utility contract structures ensure aligned discharge/charge with the needs of the system
- Enables hedging against real-time wholesale price swings or fuel price spikes
California leading the way

- Supportive incentive structures
- Progressive utilities
- Strong, early-adopter customers
Policy challenges

• Transparent procurement process
• Non-discriminatory market access
• Streamline interconnection process
• Wholesale / retail reconciliation
• Develop utility revenue model for storage projects
Questions?

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