



New England Restructuring Round Table
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Shaun Chapman
Vice President
Policy & Electricity Markets



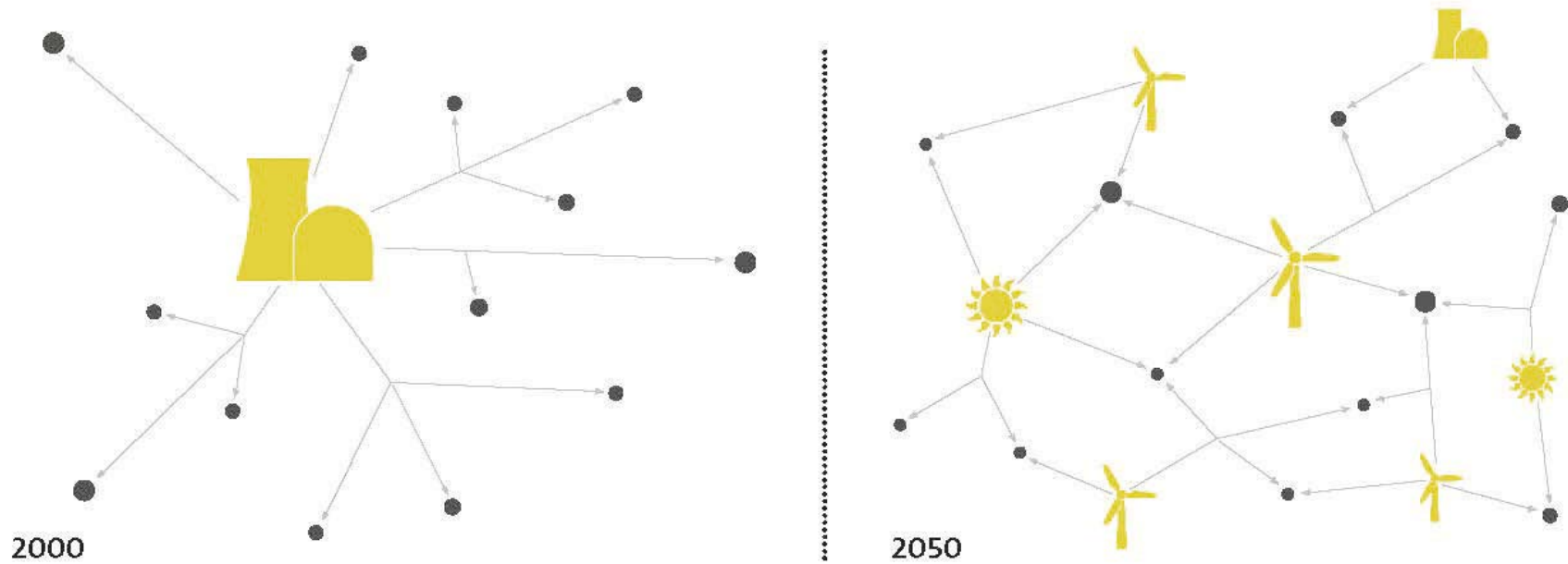
SolarCity® (NASDAQ: SCTY) provides clean energy. The company has disrupted the century-old energy industry by providing renewable electricity directly to homeowners, businesses and government organizations for less than they spend on utility bills. SolarCity gives customers control of their energy costs to protect them from rising rates. The company makes solar energy easy by taking care of everything from design and permitting to monitoring and maintenance. SolarCity currently serves 18 states. Visit the company online at www.solarcity.com and follow the company on [Facebook](#) & [Twitter](#).

The Distributed Grid

Vision for the Grid of the Future

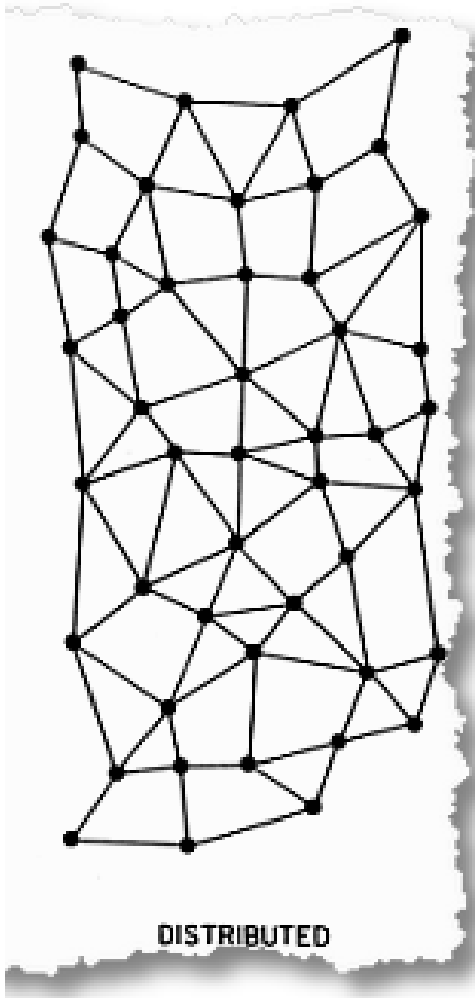


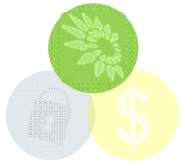
The “Decentralized Grid of Tomorrow”



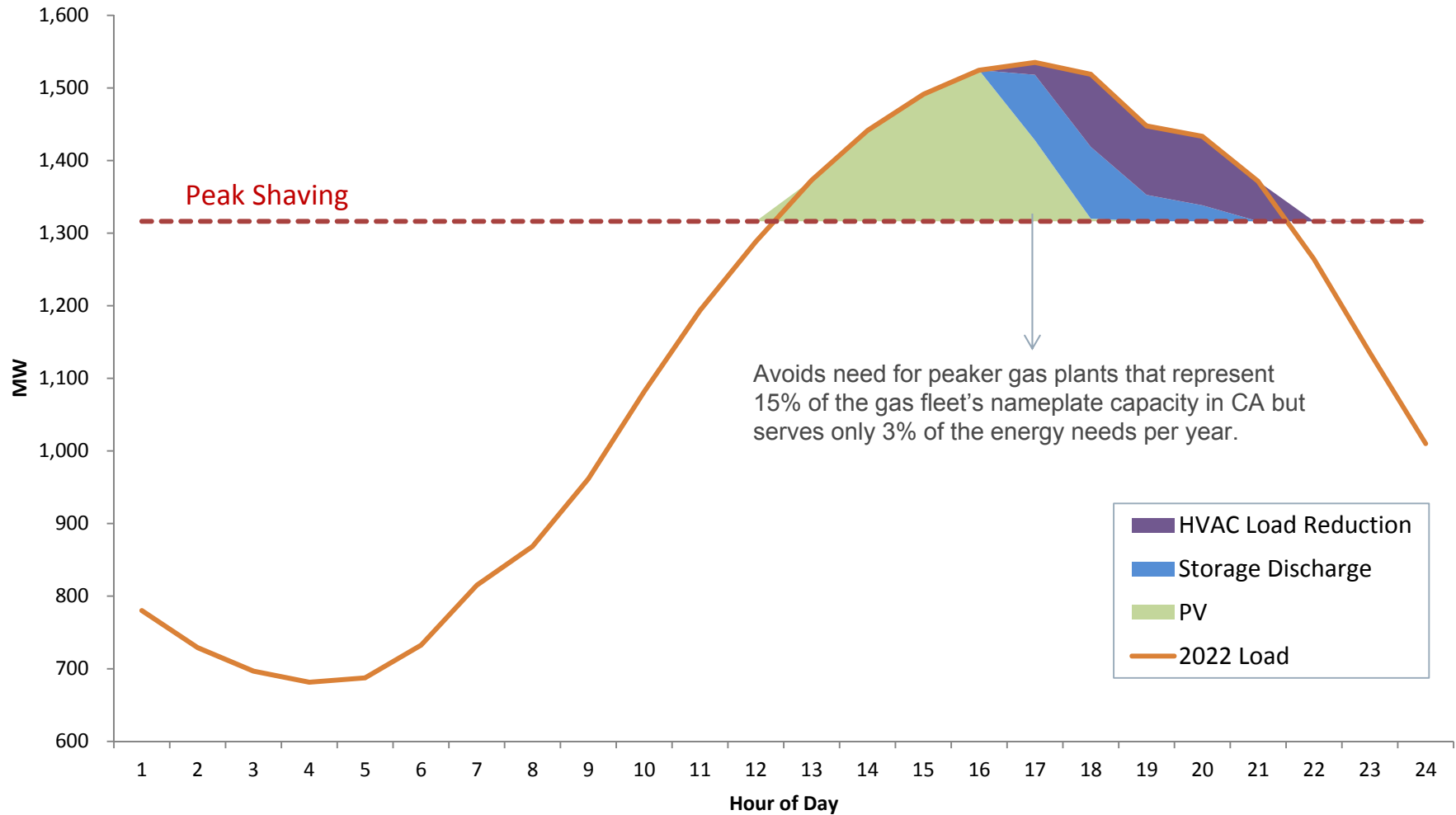
Is this the best we can do?

What Should the Grid of the Future Look Like?





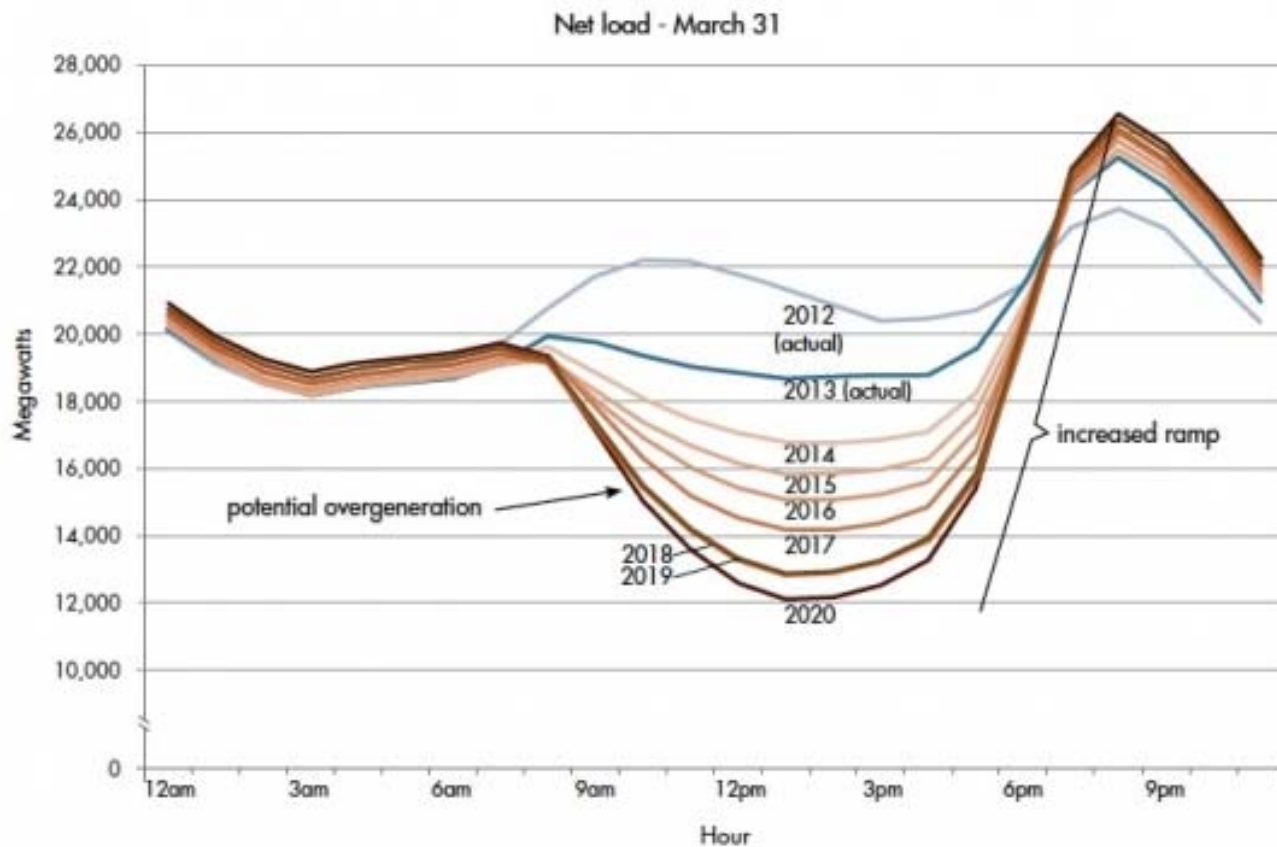
Reducing the need for peakers mitigates emissions and investment in low-utilization assets.



Source: SolarCity Proposal for SCE Living Pilot Symposium



DERs can reduce ramping needs, reducing peakers and emissions





A Distributed Grid will be more affordable.

1. Connects and coordinates **high value resources**.
2. **Reduces expensive risks** inherent in a centralized system.
3. **Increases flexibility** of the grid and improves asset utilization.

How to Enable the Distributed Grid



Don't dis-incentivize DERs

Accurately value DERs

- Avoided Costs
 - Resiliency
 - Grid Reliability Services
 - Real Option Value

Use Simple Mechanisms

- NEM

Overhaul Distribution Planning

Proactive Approach

- Stop being reactive to DER integration
- Utilities to identify optimal locations for DER
 - Lowest cost interconnection
 - Highest grid value
 - Customer choice
- Open distribution investments to competition by DERs

DER as Load Modification

- Every customer has a right to install DER
- Proactively plan, just like load
- Network upgrade benefits attributed to all

Make the Utility A Motivated Stakeholder

- The dilemma: Utilities only earn a return on infrastructure investments → Investments fought for absent whether or not the public needs/wants them
- Pete Rive: *A Possible Solution to the Revenue Shift*:
<http://blog.solarcity.com/a-possible-solution-to-the-revenue-shift>
- ConEd: BQDM Project: <http://breakingenergy.com/2014/12/22/ny-psc-approves-con-edison-bqdm-program/>
- *Balance between volumetric and flat rates*
 - *Fixed demand charges are not the silver bullet answer*

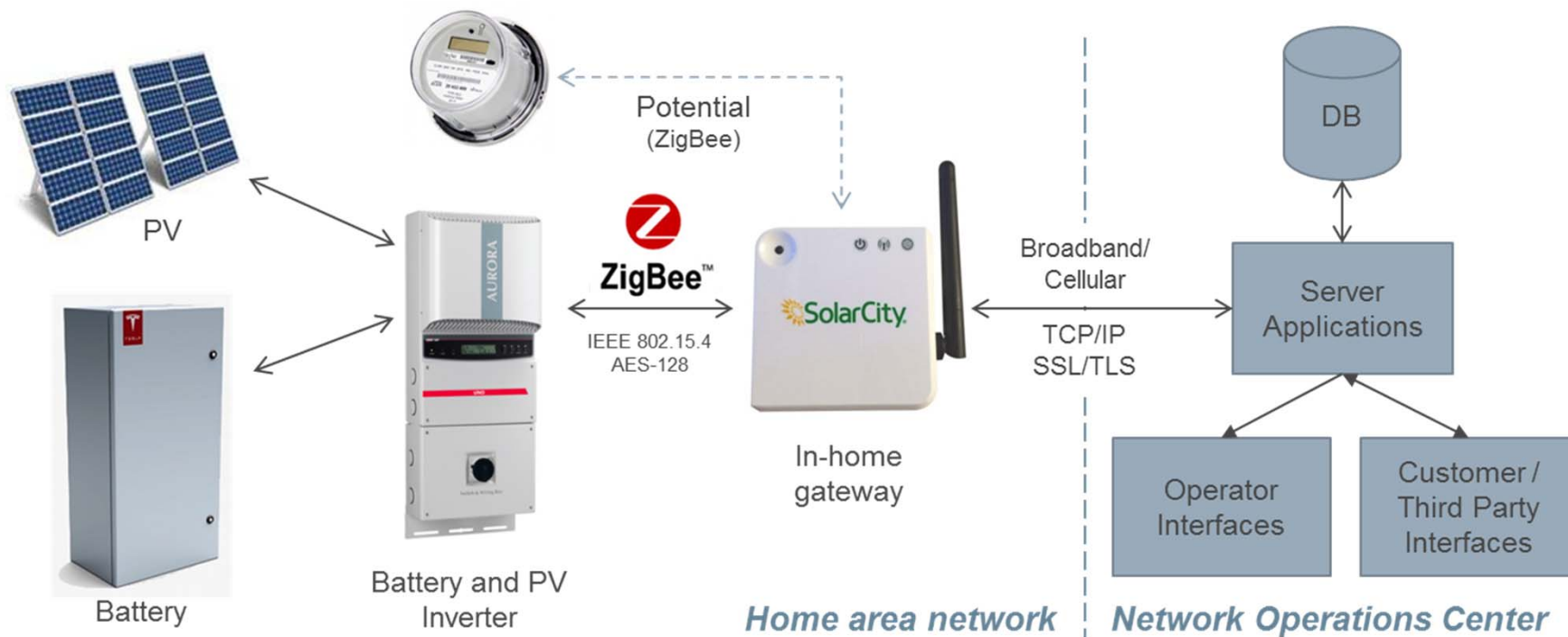
Enable utility DER coordination, not control

Table 9. Price Responsive versus Conventional Interruptible or Direct Control

Demand Response Attributes	Conventional Interruptible or Direct Load Control	Price Response
Program Structure	DR remains a utility program	DR becomes a default condition of service
Equipment Costs	Utility provides, limited suppliers, high cost	Customer provides, many suppliers, customized, low cost
Who participates – DR Market	<ul style="list-style-type: none"> Limited participation Requires a specific, targeted end-use 	<ul style="list-style-type: none"> All customers eligible All load can participate
Expected Load Impacts	<ul style="list-style-type: none"> Depends on control strategy effectiveness Dependent upon targeted end-uses 	<ul style="list-style-type: none"> Depends upon customer value function Pilots show greater impacts than DLC
Compatibility with efficiency, solar, load shifting objectives	<ul style="list-style-type: none"> Incentives not compatible Central control not compatible with objectives 	Fully compatible with all objectives.
Incentives / Equity	<ul style="list-style-type: none"> Fixed participation incentives over/under estimate payments for all customers. No way to validate load contributions. 	<ul style="list-style-type: none"> Incentives based on actual customer metered usage
Customer Acceptance, Customer Choice	<ul style="list-style-type: none"> Customer comfort dependent upon utility control strategy Choice is accept or don't participate 	<ul style="list-style-type: none"> Customer determines control Customer determines when and how to control There are no dropouts.

Source: LBNL Study – HECO DR Roadmap, Jan 2013

Invest in infrastructure for granular DER control



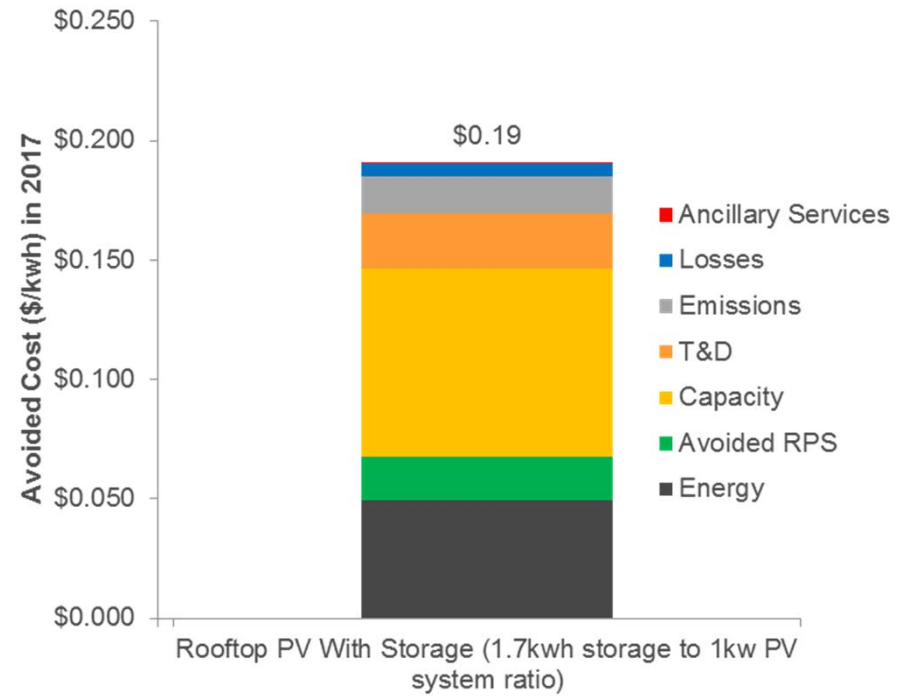
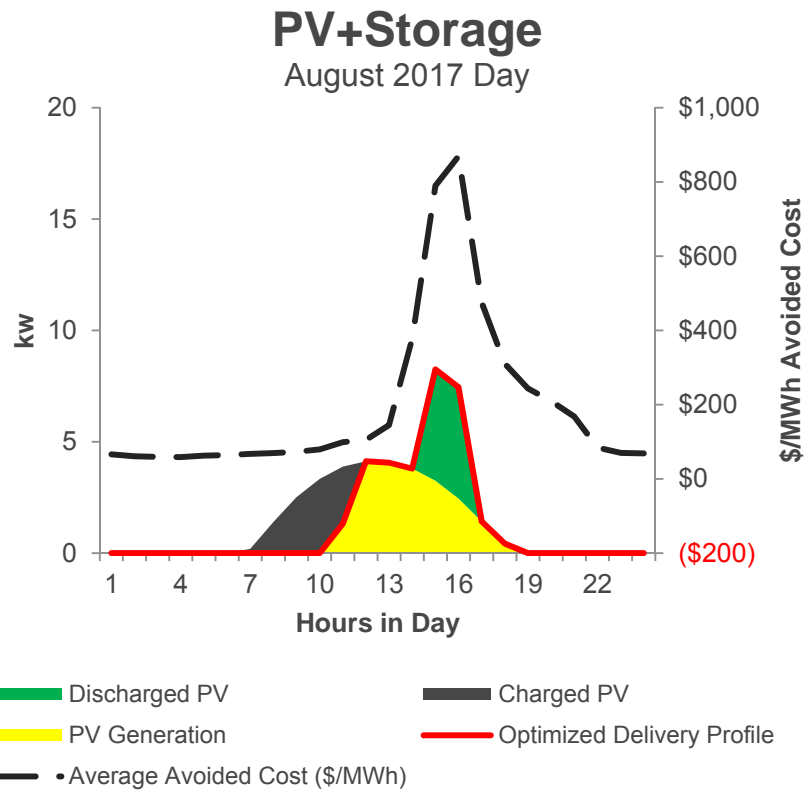


DERs payoff for ratepayers

Revamp

Output mirrors System Costs

Avoided Cost = Retail Rate



Summary

- Keys to an affordable, reliable and clean electric grid.
 - Strategy
 1. Maximize cheap energy with PV
 2. Follow the PV generation with as much load as possible
 3. Follow inflexible load with PV-powered storage
 4. Goal – a short, flat net-load curve.
 - Principles of a distributed system that is cheap, clean, reliable.
 - Do not create disincentives for the adoption of cheap, clean solar.
 - Decrease variability of supply and demand through better forecasting.
 - Increase predictability of supply and demand through intelligent control systems and new incentive mechanisms.
 - Do not put needed transition investments on hold for sunk costs.

Thank You

Shaun Chapman
Vice President, Policy & Electricity Markets
SolarCity
schapman@solarcity.com