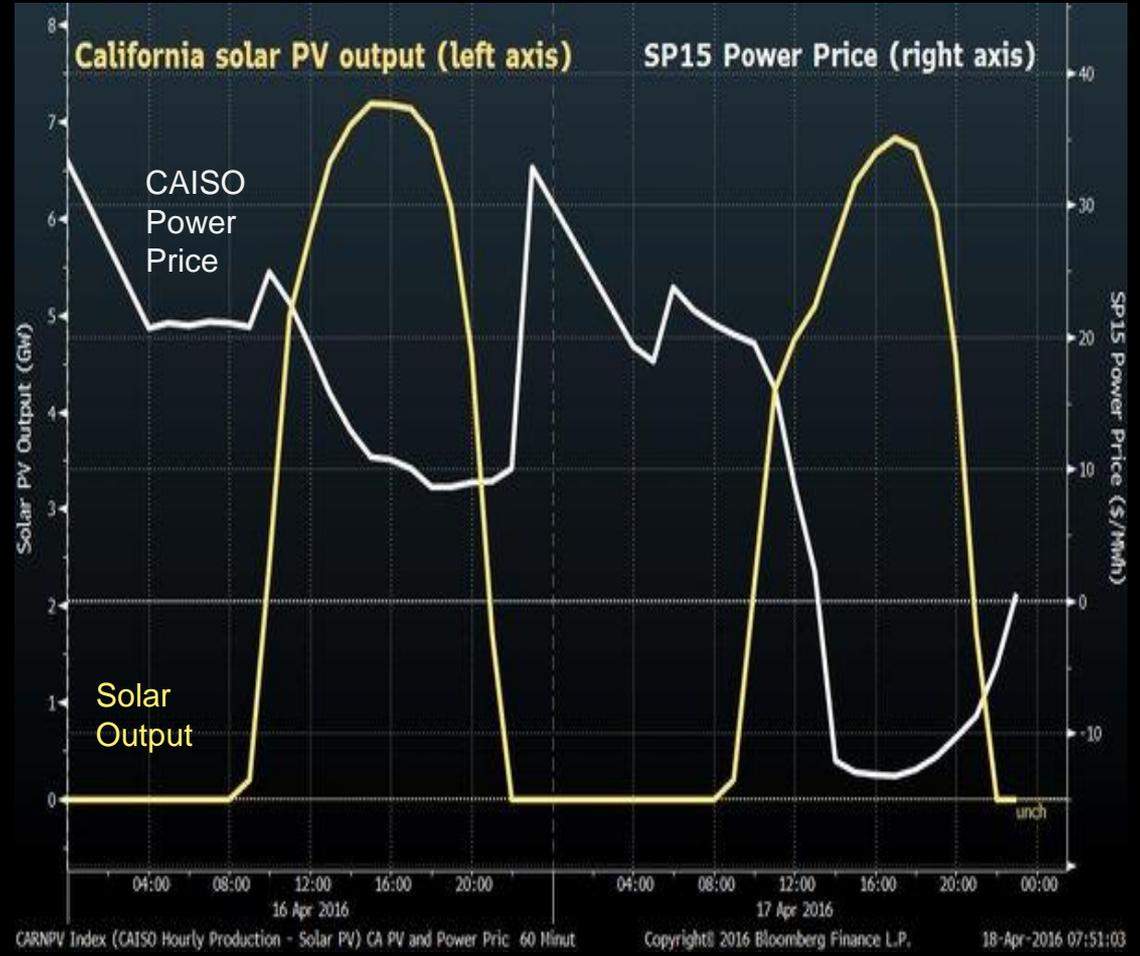


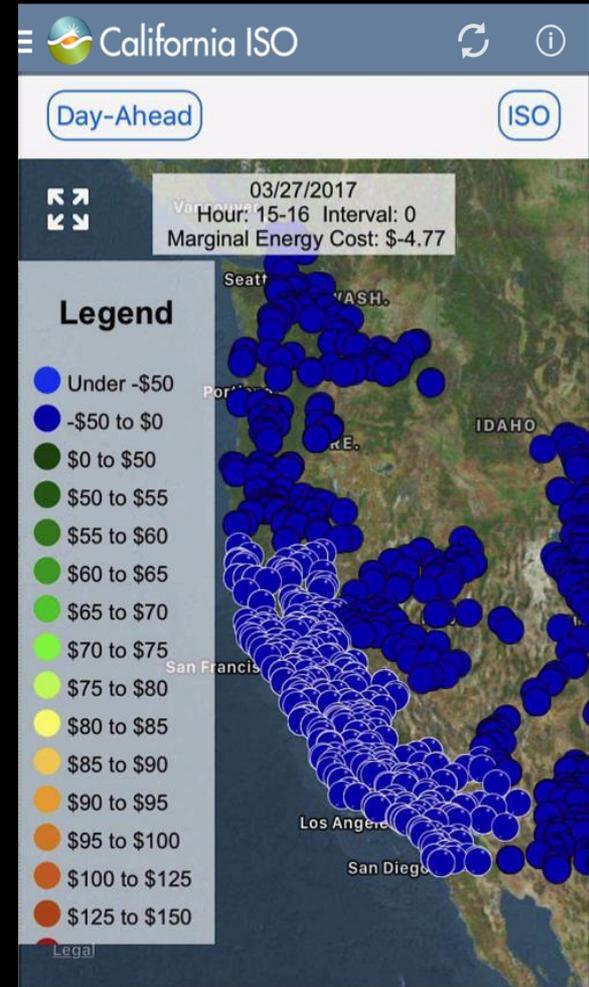
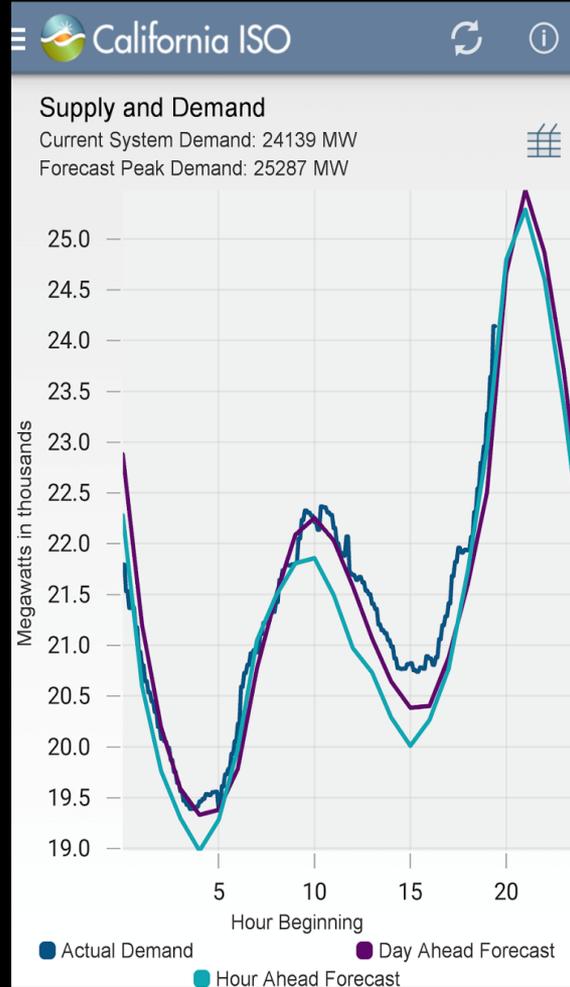
Energy Efficiency is a Distributed Energy Resource

NEEC Webinar
March 2018

Solar Energy Drives New Grid Dynamics



Lots of Renewables, But Nobody's Buying





Diablo Canyon Nuclear Power Plant Closure

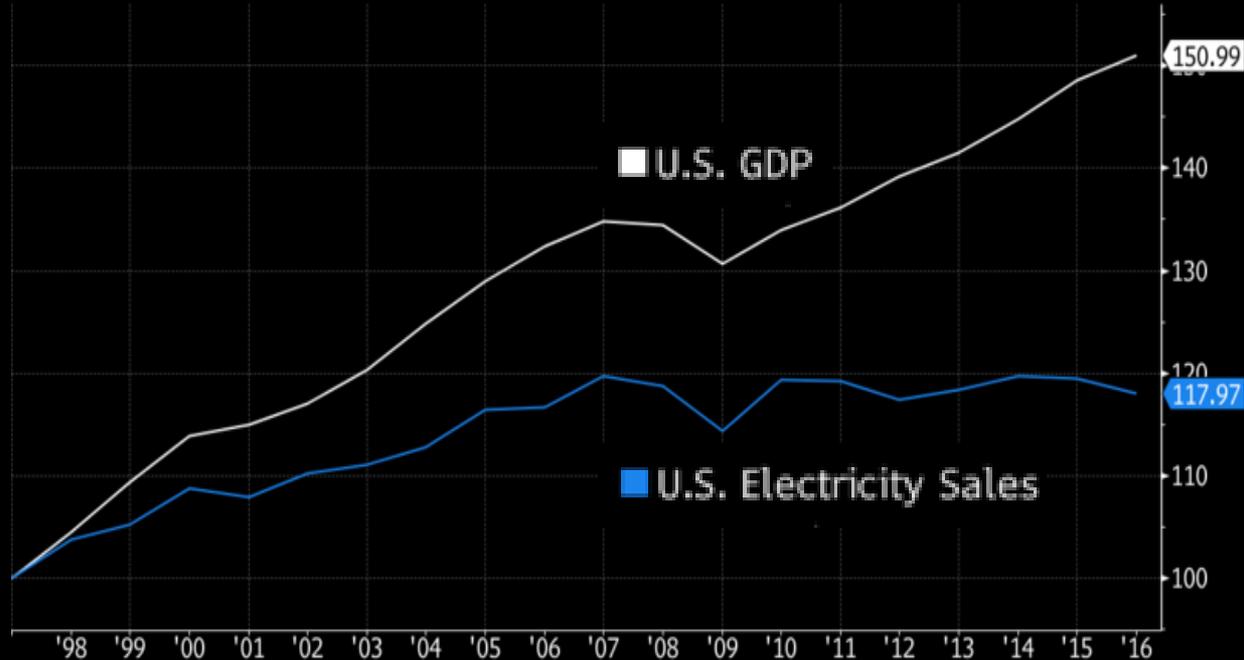


Declining Load Growth and Electrification

No Power Boost

Electricity sales have been stagnant despite GDP growth

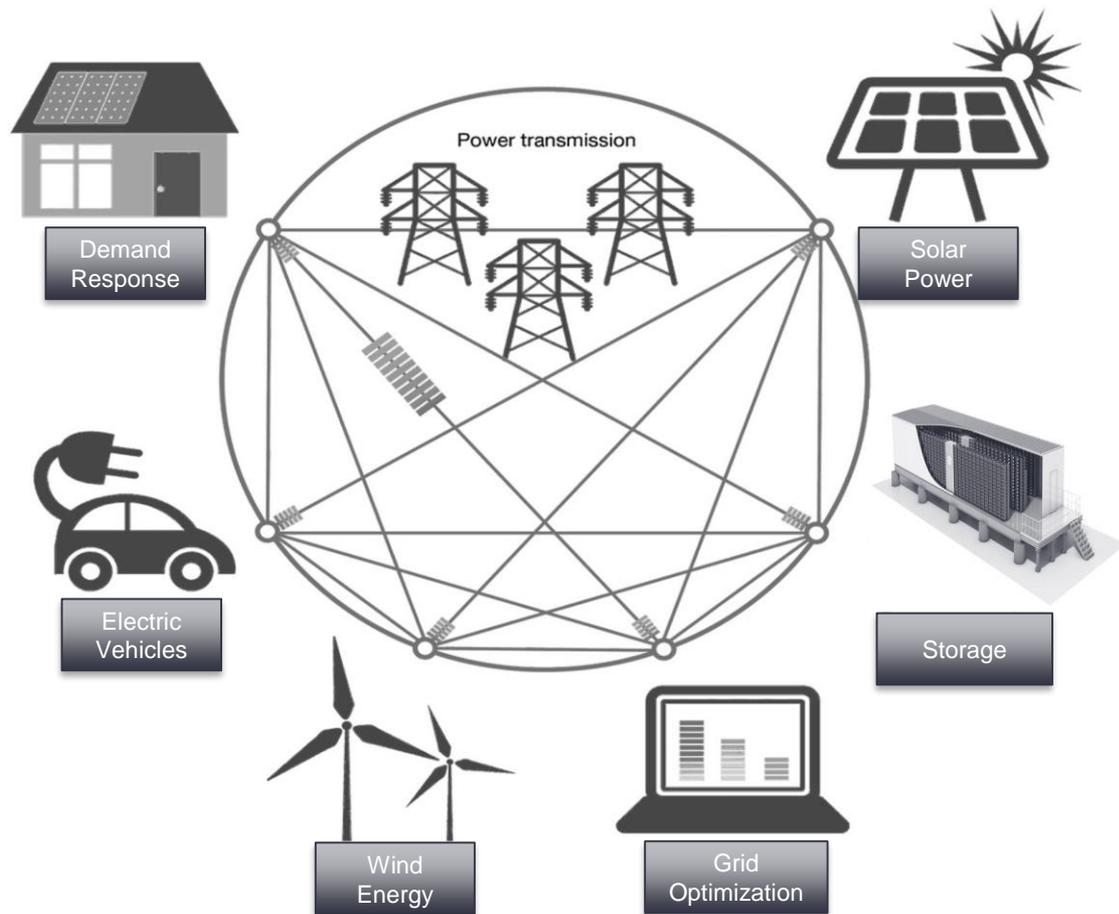
Normalized As Of 12/31/1997 ■ U.S. GDP ■ U.S. Electricity Sales



Source: U.S. government data compiled by Bloomberg

Bloomberg

Energy Efficiency Has to Fit Into Distributed Energy Resource Markets

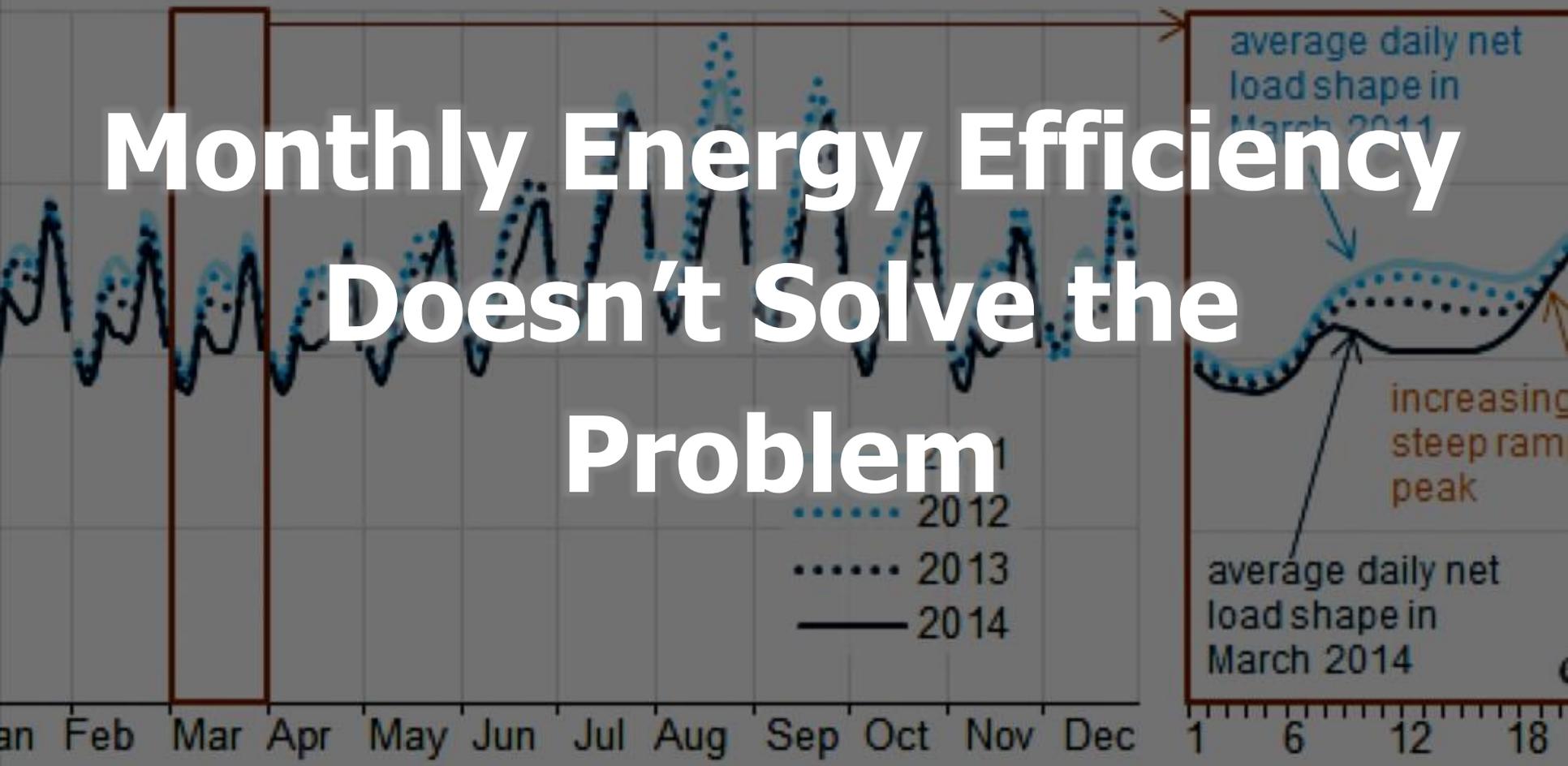


average daily net load by month (2011-14)

atts

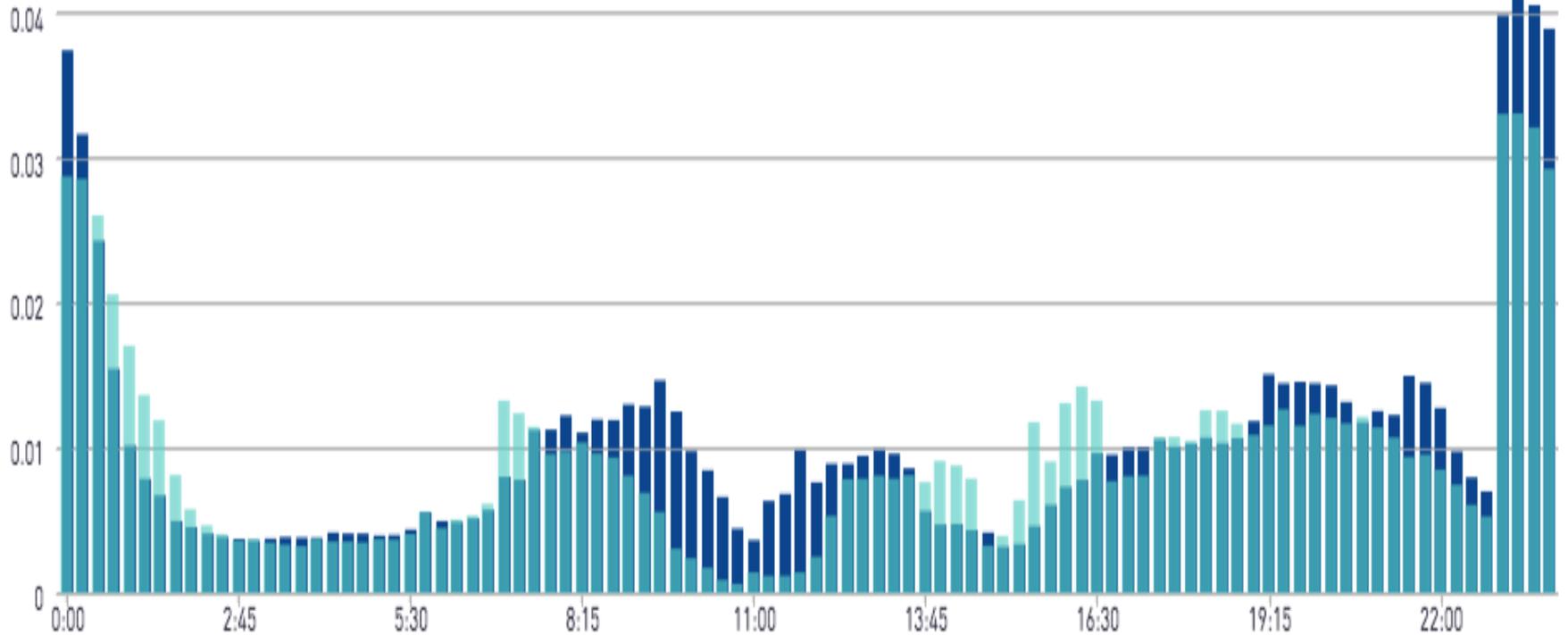
CAISO average daily load (March)

Monthly Energy Efficiency Doesn't Solve the Problem



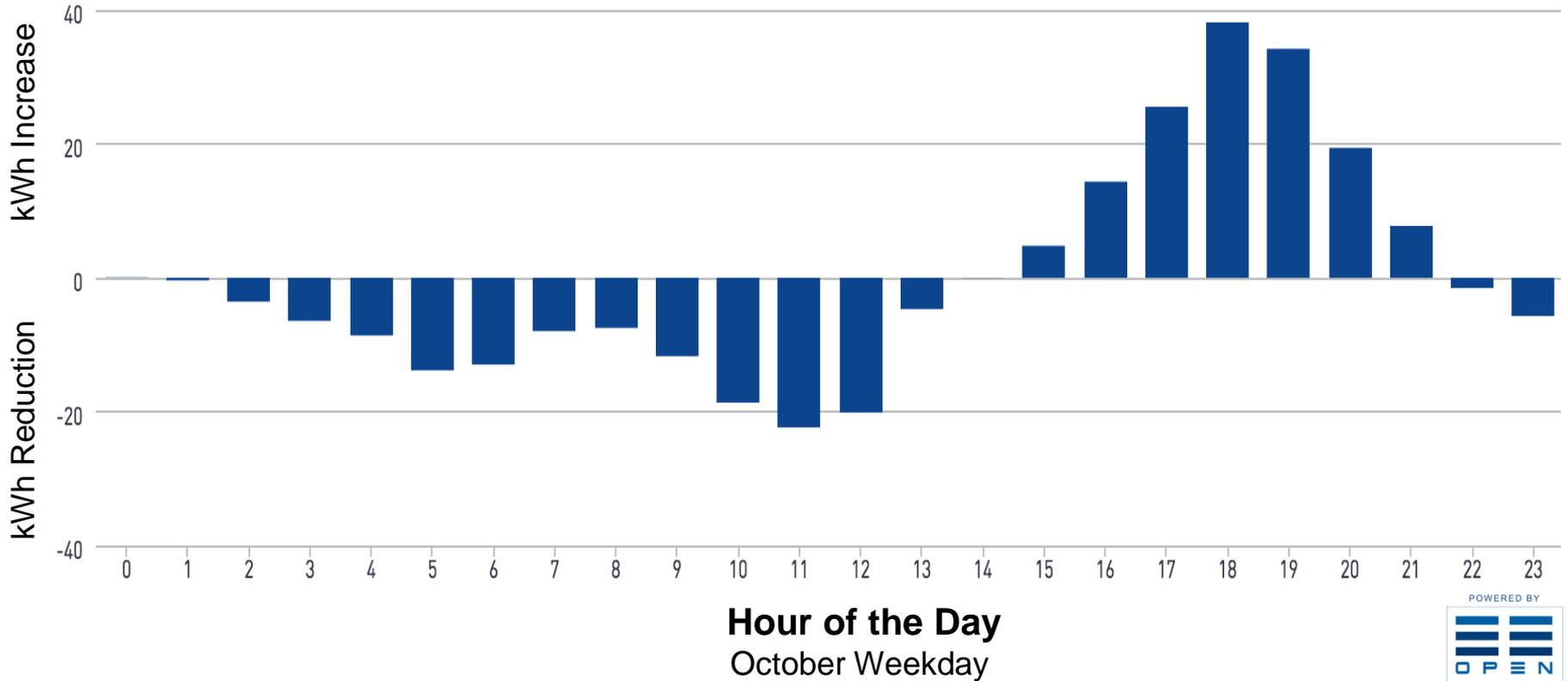
≡ RESOURCE CURVE

Time Based Savings



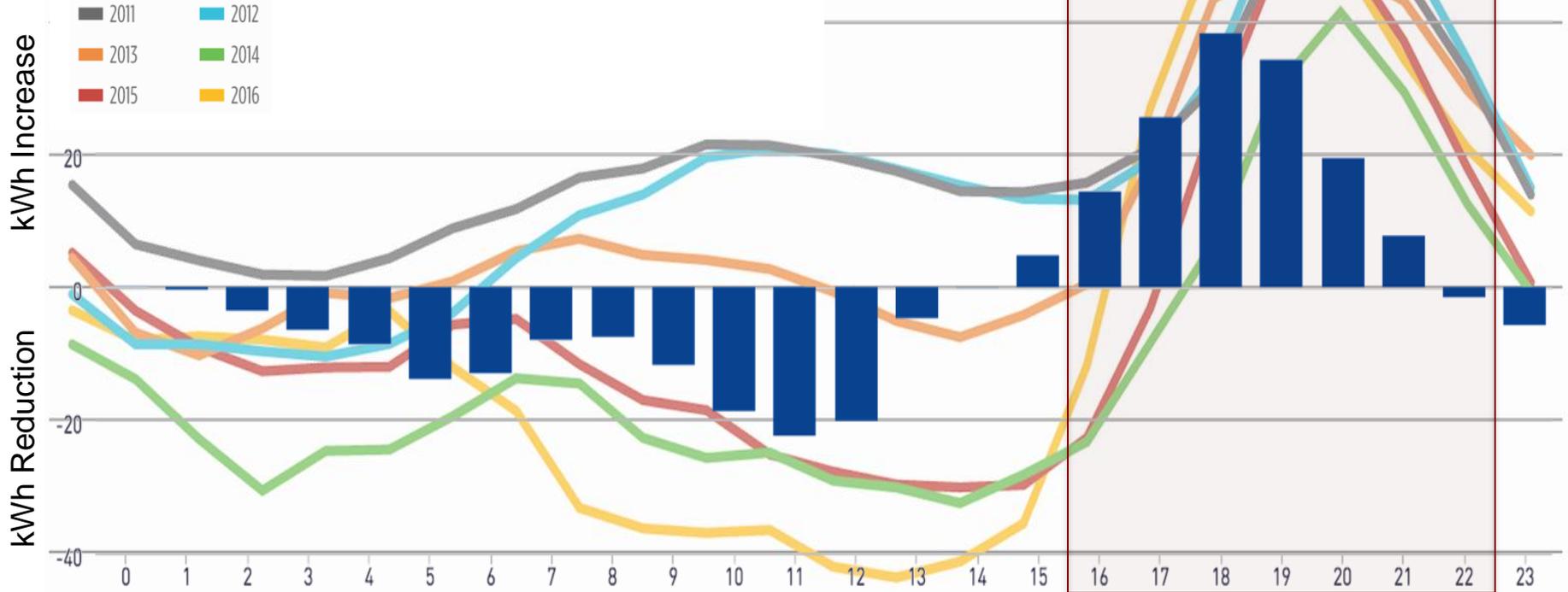
RESOURCE CURVE

Savings Load Shape



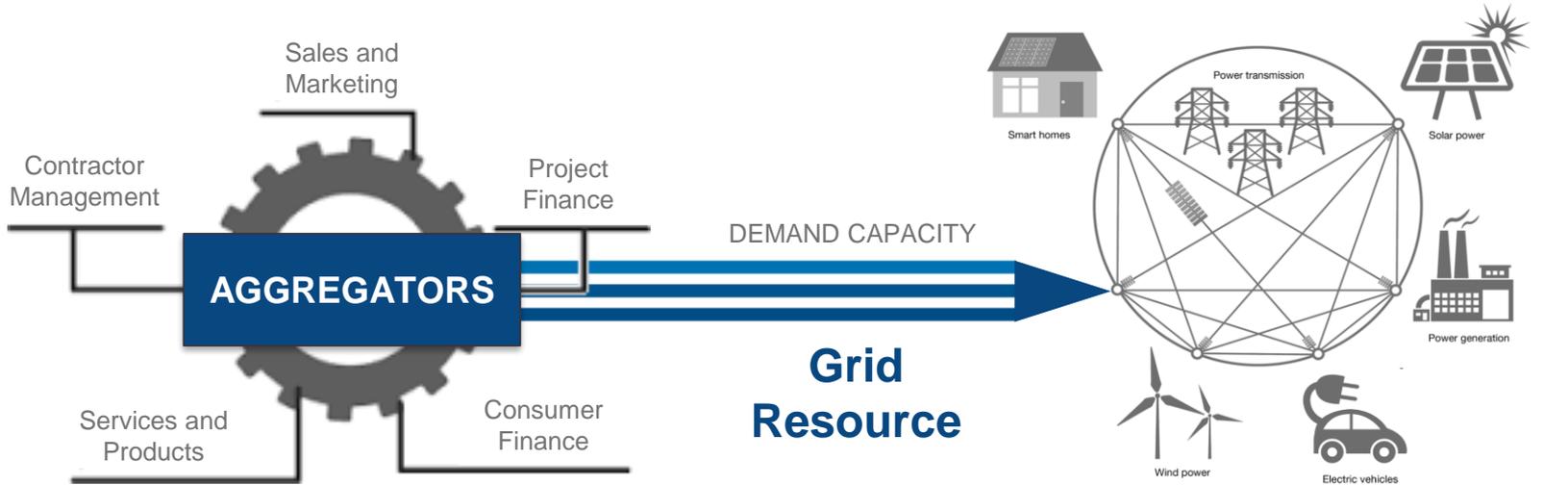
RESOURCE CURVE

Savings Load Shape



Hour of the Day
October Weekday

Align Incentives with Pay-for-Performance



↓ **Business Models** ↑

Savings Comfort Health

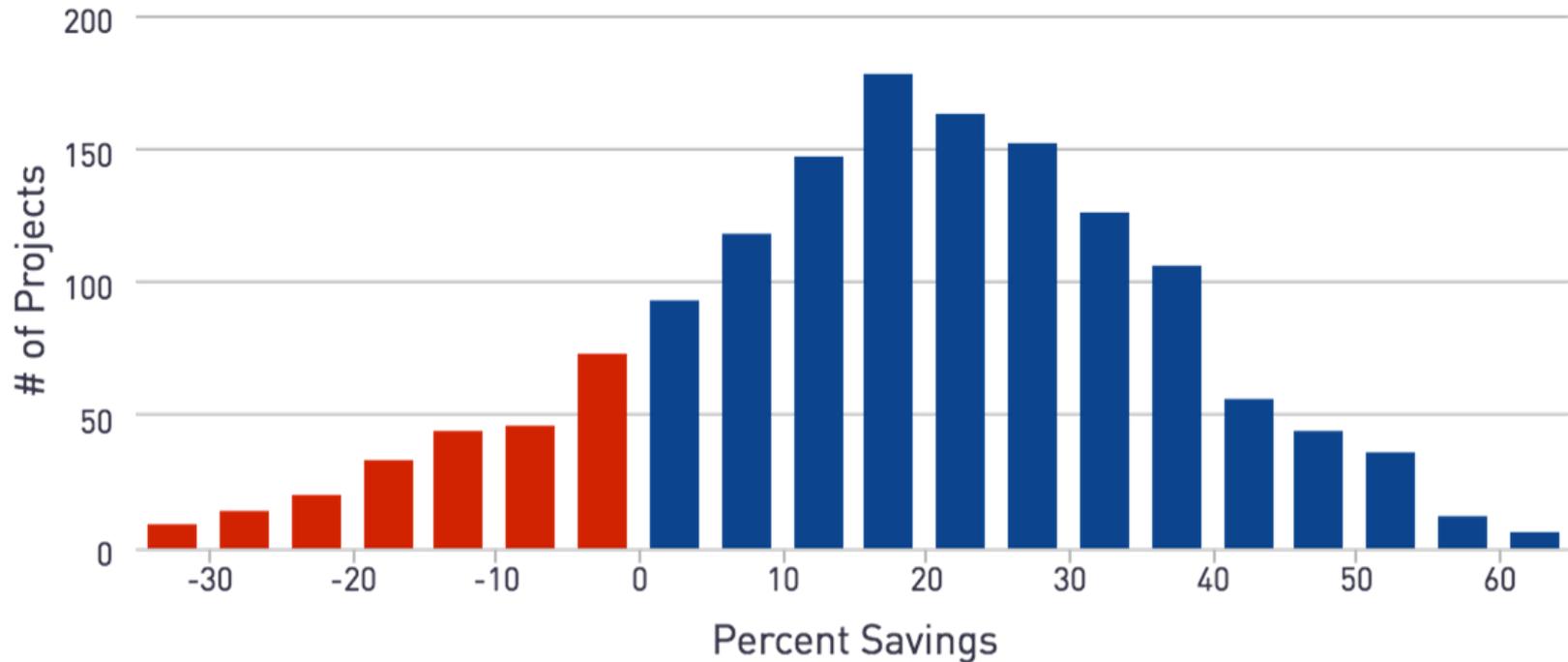


Project Finance: The long-term financing of projects based upon projected cash flows rather than the balance sheets of its sponsors.



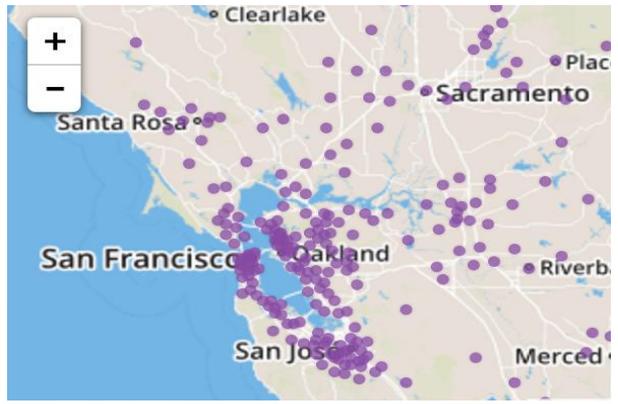
Efficiency Risk is Manageable as a Portfolio

Natural Gas Savings Distribution



Open Source Real-time Metered Efficiency

<p>13%</p> <p>Gas Savings</p>	<p>139</p> <p>Annual Therms Saved Project / Year</p>	<p>2,149</p> <p>Gas Meters</p>
<p>4.1%</p> <p>Electric Savings</p>	<p>356</p> <p>Annual kWh Saved Project / Year</p>	<p>2,643</p> <p>Electrical Meters</p>



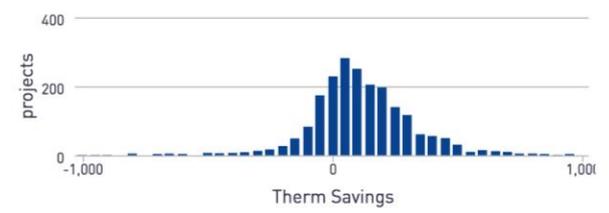
① Natural Gas Savings [Average Normal Year]



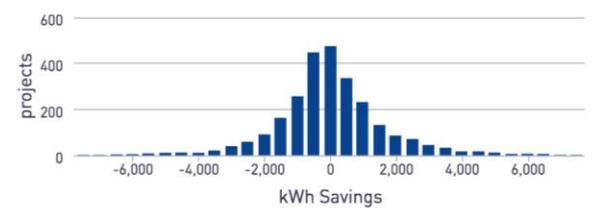
① Electricity Savings [Average Normal Year]



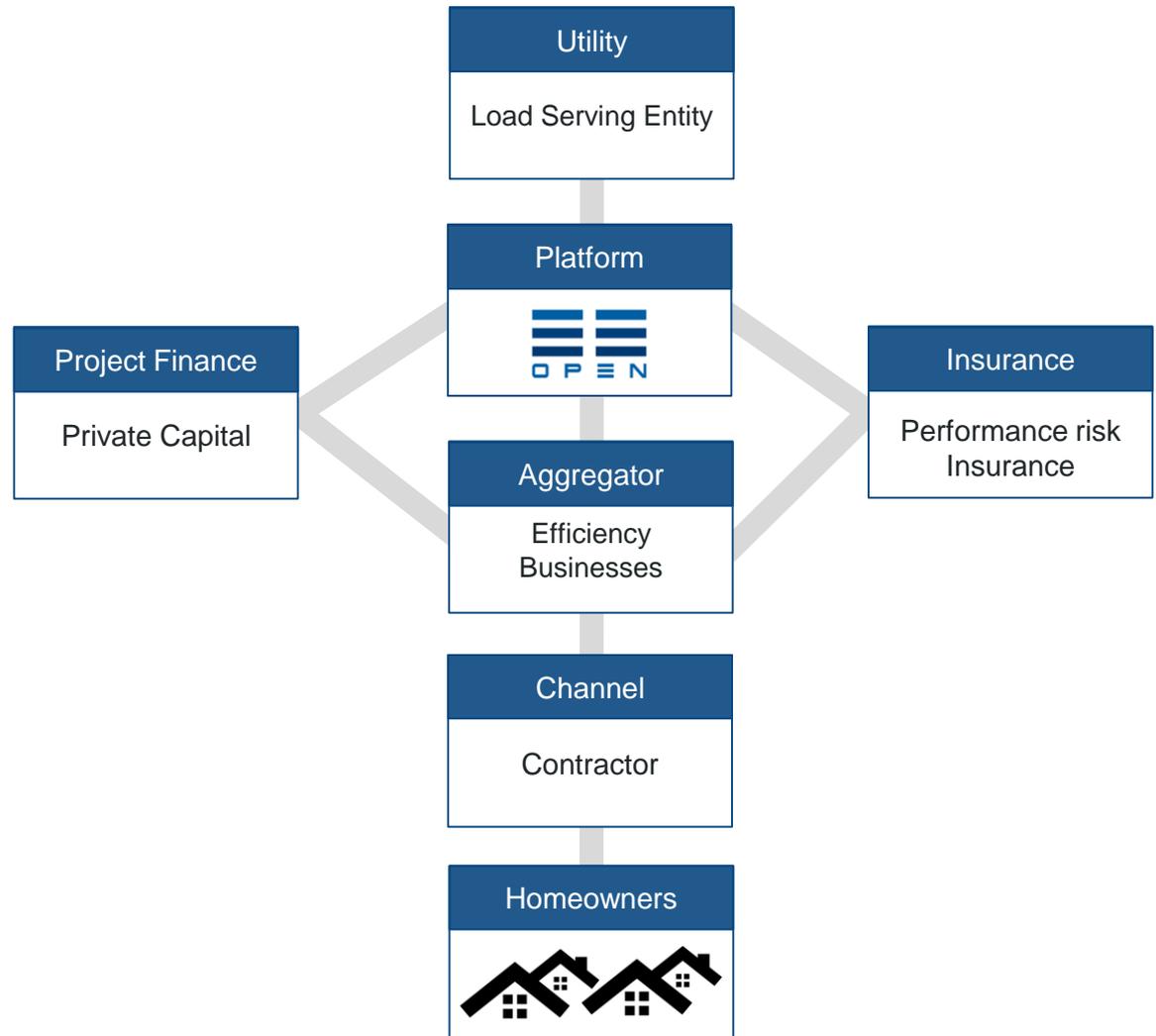
① Therms Savings Distribution



① kWh Savings Distribution



Pay-for-Performance Deal Structure and Financing





State of Oregon Climate Order

5. Increasing Energy Efficiency through Retrofits of Existing Buildings Across the State

- A. Energy Trust of Oregon Pilot Programs. Oregon Public Utility Commission (PUC) is directed to work with the Energy Trust of Oregon and interested stakeholders to expand meter-based savings pilot programs, including pay-for-performance pilot programs, by January 1, 2019. PUC shall consider inclusion of pilot programs, which do not significantly raise energy efficiency delivery costs, and that focus on existing single family homes, multi-family residential buildings, commercial buildings, and methods to incentivize energy efficiency in building stock that is significantly below current building code requirements.
- C. Coordination of Data. ODOE and PUC are directed to support and assist private sector partners in efforts to coordinate sharing of data that shows projected energy use reductions in the region. This data will be made available to the public to inform energy efficiency policies, as appropriate, by January 1, 2020.



Residential Pay-for- Performance

Develop models for taking Res EE to scale by enticing more private capital

Achieve Data Driven M&V by measuring “at the meter”*

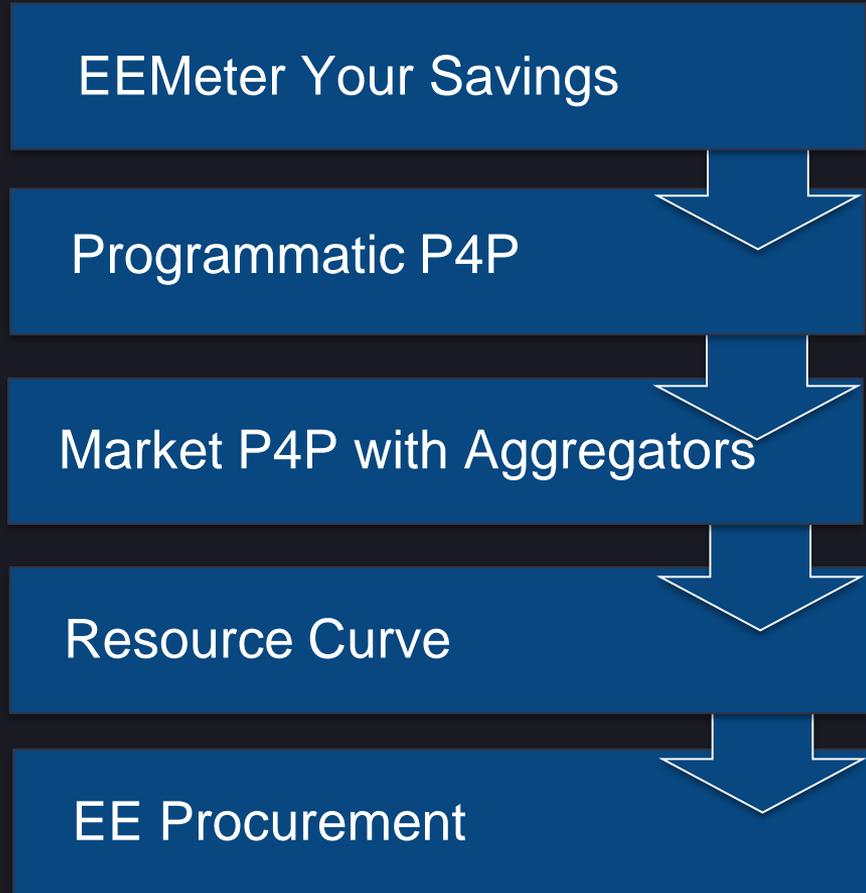
Pay for measured savings performance from retrofits and BROs

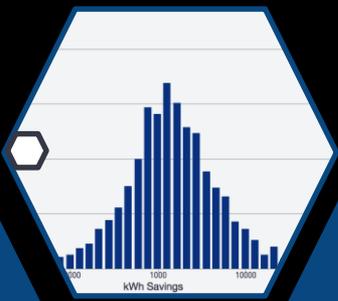
Develop a program that can successfully transition to grid-tied procurement



* Weather-normalized

Roadmap To EE as a Distributed Energy Resource





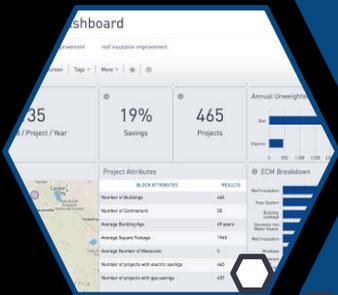
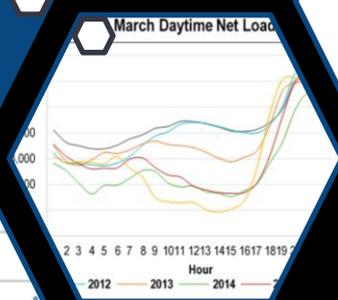
Procurement

Pay for Performance

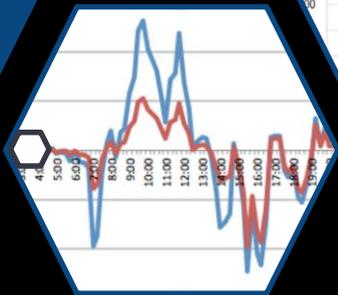
Demand Capacity



Resource Curve



EEMeter



Matt Golden, CEO
mattgolden@openee.io