Pay for Performance Primer

10/12/18

Welcome to our 1st Pay for Performance Webinar

Elizabeth Titus
Director of Research and Evaluation, NEEP

Agenda

What is Pay for Performance (P4P)? (12 mins)
- *Megan Fisher - Senior Project Manager, NYSERDA*
- *Giselle Procaccianti – Commercial & Industrial Program Manager, NEEP*

P4P Programs vs Traditional Energy Efficiency Programs (15 mins)
- *Hassan Shaban – Senior Data Scientist, Open Energy Efficiency*

Key Drivers and the future of P4P Programs (20 mins)
- *Matt Golden - CEO, Open Energy Efficiency*

P4P in the Northeast (by state and/or utility) (10 mins)
- *Mei Poon – Senior Specialist for Pilots and Emerging Technologies, Consolidated Edison*
- *Patti Boyd - Senior Technology Strategist, DC Sustainable Energy Utility (DCSEU)*

Answers to typed questions (7 mins)
- *Giselle Procaccianti (NEEP)*

Conclusion (5mins)
- *Giselle Procaccianti (NEEP)*

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What is Pay-for-Performance?

What is Pay-for-Performance?

Pay for Performance (P4P) is an approach to procuring energy efficiency savings that invests in ***measured savings*** at the ***portfolio level*** using a market-based program design.

The P4P Pilot will be:

- Directed at solutions providers (aggregators)
- Designed and implemented in partnership with utilities
- Designed to allow solutions providers to innovate, reduce costs, and increase customer value
- Designed to accomplish deeper savings beyond the low-hanging fruit

Who will be involved?

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Innovative Elements of P4P

Key Elements	Existing Programs	P4P Opportunities
Compensation	Percentage of project cost or fixed rate for specific measures	Market value for delivered energy savings
Measures	Only permitted energy efficiency measures eligible for funding	Measure agnostic and fuel neutral approach
Timing of payments	One-time payment/rebate	Multiple years of cash flows
Measurement of energy savings	Not normally required for payment	Ongoing savings calculations using weather-normalized meter data
Scale and risk	Project level approach to investing	Design for scale and risk management at the portfolio level
Program design/administrator	Separate NYSERDA and utility programs	Jointly administered, leverage strengths and resources

P4P Benefits

End-Use Customers	Aggregators/Contractors	Utilities
• Increased confidence in savings • Access to a broader set of solutions and services, including finance solutions with little or no upfront contributions • Longer and more comprehensive relationships with clean energy solution providers	• Flexibility to design services around what customers want • Minimized transaction costs and administrative burden • Multi-year cash flows that can support finance solutions and add-on services • Portfolio level performance to manage risk and achieve scale	• Elevate EE as a utility resource, with potential temporal and locational impacts • Start to shift performance risk to the market • Longer term visibility into system impacts of EE • Resource views as “portfolios”, not projects

The connection between M&V 2.0 and current P4P programs

M&V 2.0 Definition

M&V 2.0 refers to the increasing granularity of available energy consumption data, and the enabling of automated M&V methods that continuously analyze the data and provide early, accurate and valuable insights to various stakeholders about energy savings estimates.

~Rocky Mountain Institute

Technologies that support M&V 2.0

- Advanced Metering Infrastructure (AMI)
- Building Energy Systems
- Smart meters and connected devices
- Ubiquitous networks (e.g. Wi-Fi, Bluetooth etc.)
- Powerful data analytics tools

What does M&V 2.0 promise?

Better accuracy

More reliability

Higher levels of transparency

Modernize Energy Efficiency Markets

Create innovative delivery mechanisms

Revise policies and standardize approaches to tracking energy savings

The purpose of Pay for Performance Programs Today

To track and reward energy savings as they occur

M&V 2.0 supports this by:

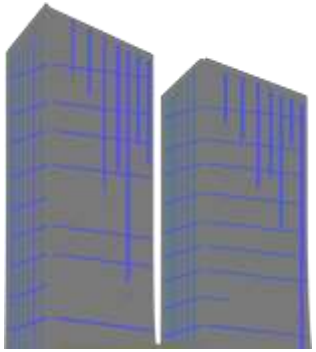
1) Increasing the granularity of energy usage data
2) Providing improved data access and advanced analytics

Pay-for-Performance

vs.

Traditional Program Designs

Current Paradigm



Program Implementers

Utilities

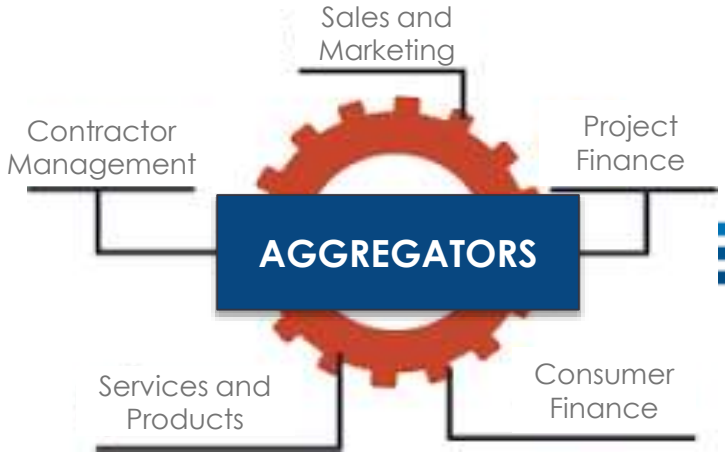
Regulators

Evaluators

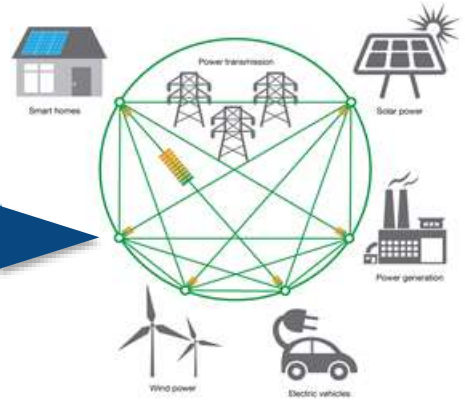
Contractors

Customers

Market Pay-for-Performance



Resource Curve



Grid Resource

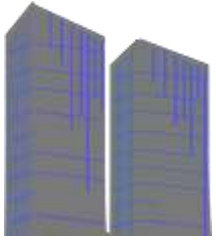
Business Models

Savings Comfort Health

Payment Models

STANDARD MODEL

Implementers propose an itemized budget



Rebates/ Incentives

PAY-FOR-PERFORMANCE

Aggregators bid a unit savings price

Flexibility in business models

Quantifying Savings

DEEMED

DEER
(Database of Energy Efficiency Resources)

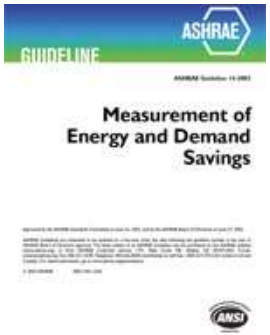
MODELED

OpenStudio

EnergyPlus

METERED

Uniform Methods Project for Determining Energy Efficiency Program Savings



CALTRACK

OPEN

CALTRACK

- Standard Calculation Methods for Energy Efficiency and Electrification
- Monthly, Daily, and Hourly
- Public 60 Stakeholders Empirical Process
- www.CalTRACK.org

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- Python CalTRACK Engine
- Open Source Apache 2.0
- Available Without Restriction
- How It Works: https://goo.gl/mhny2s
- Code Repo: https://goo.gl/qFdW4P

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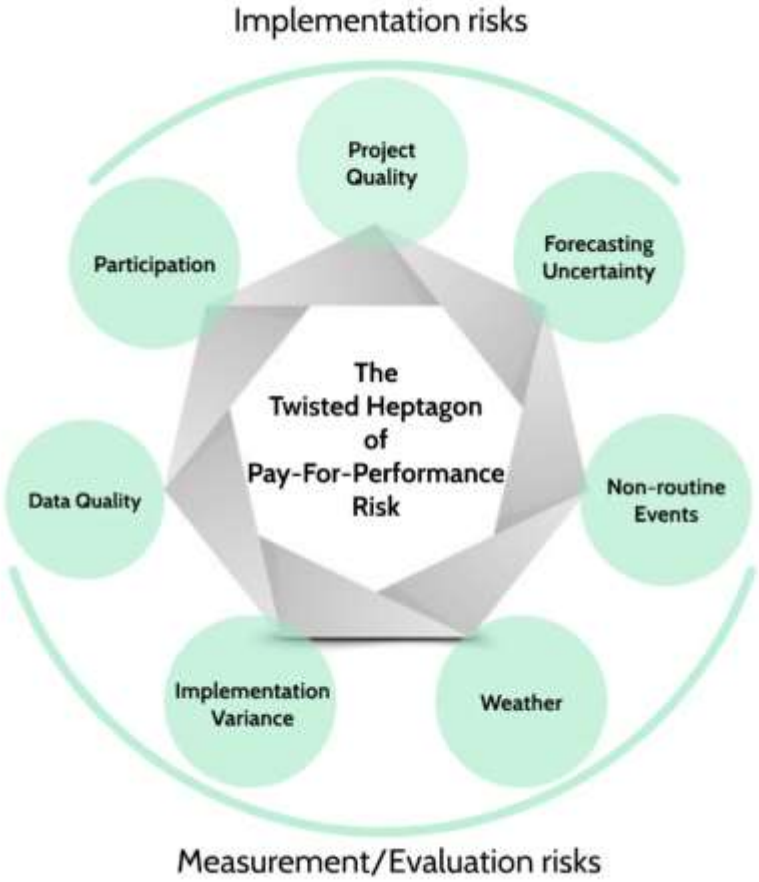
Performance risk is unavoidable, but quantifiable



https://www.openee.io/post/playing-with-fire-and-not-getting-burned-risk-management-in-pay-for-performance-efficiency

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Risk Reallocation

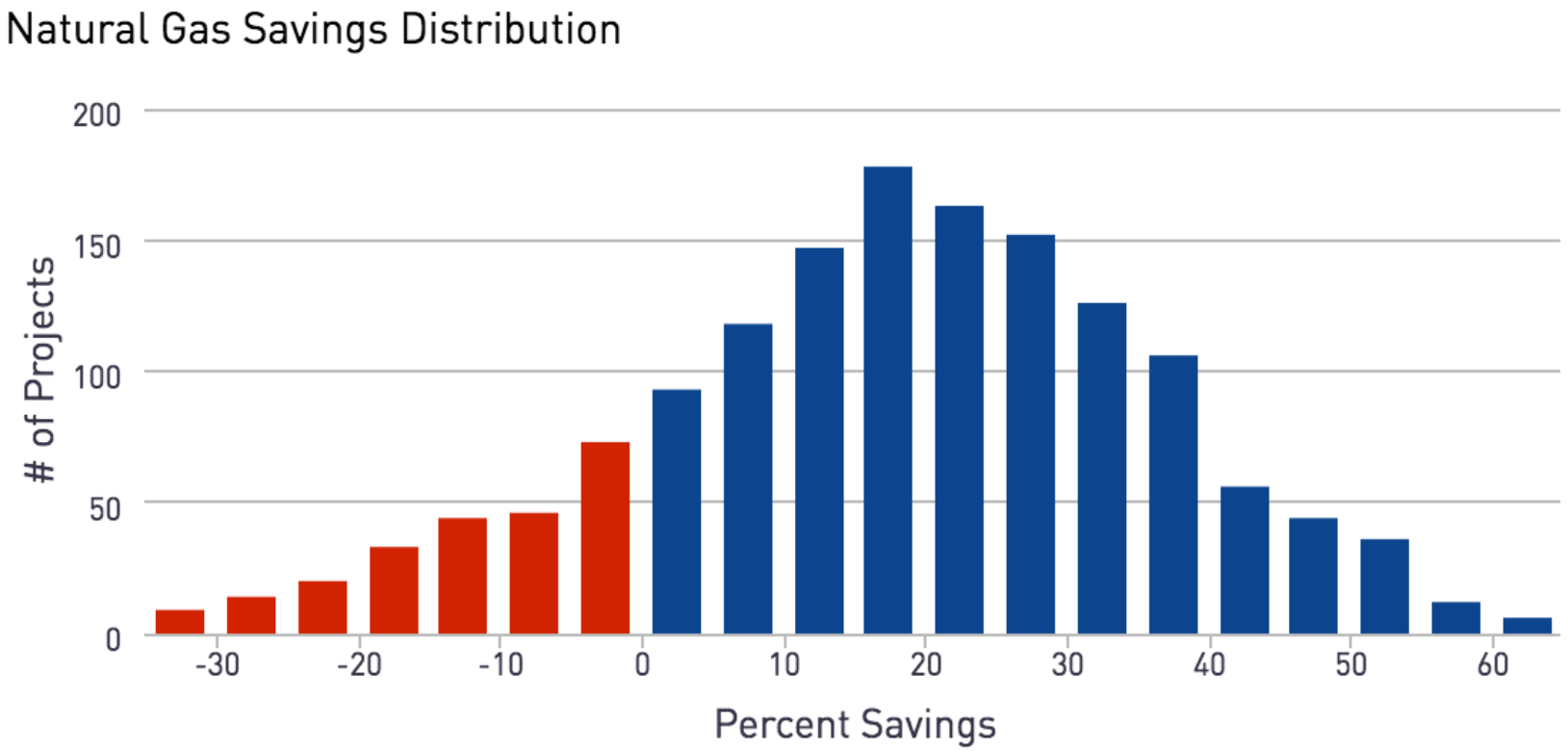
STANDARD MODEL

- Utilities and their ratepayers are exposed to the bulk of performance risk.
- Risk is expressed through the realization rate.
- High level of evaluation risk.

PAY-FOR-PERFORMANCE

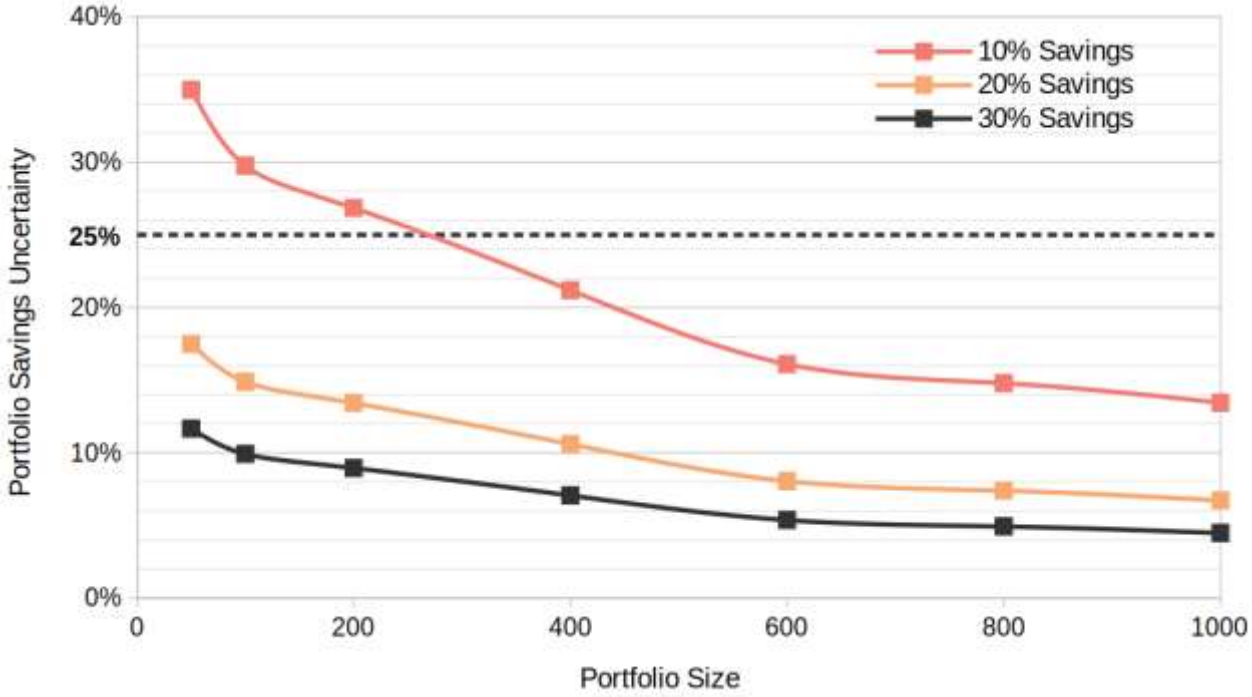
- Aggregators shoulder most of the implementation risks.
- They are also best positioned to control and mitigate them.
- Evaluation risks can be mitigated using standard weights and measures.

Performance Risk is Manageable in Portfolios



Aggregation Delivers Confidence in Savings

How big does a portfolio need to be?



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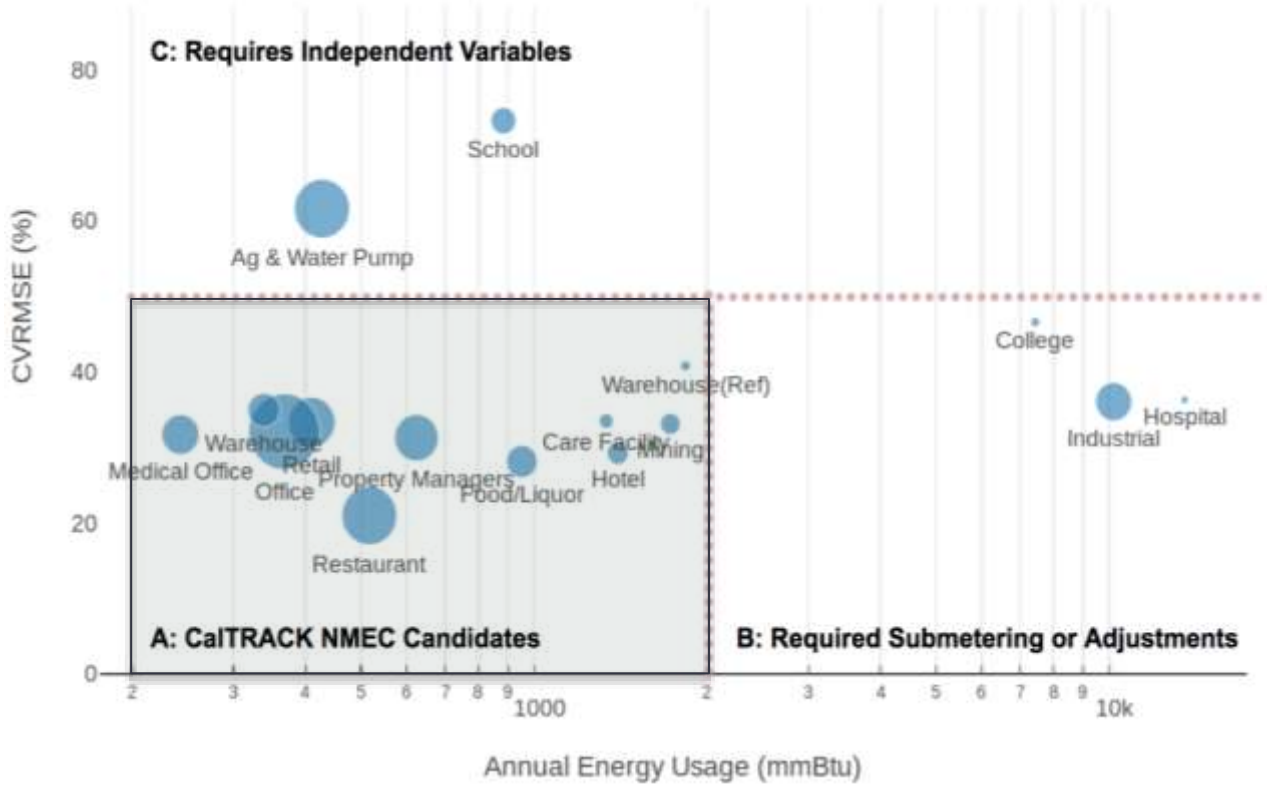
On What Types of Buildings Will This Work?



*Based on out of sample test on 50 Million IOU meters in California through the CEC using 2014 and 2015 data.

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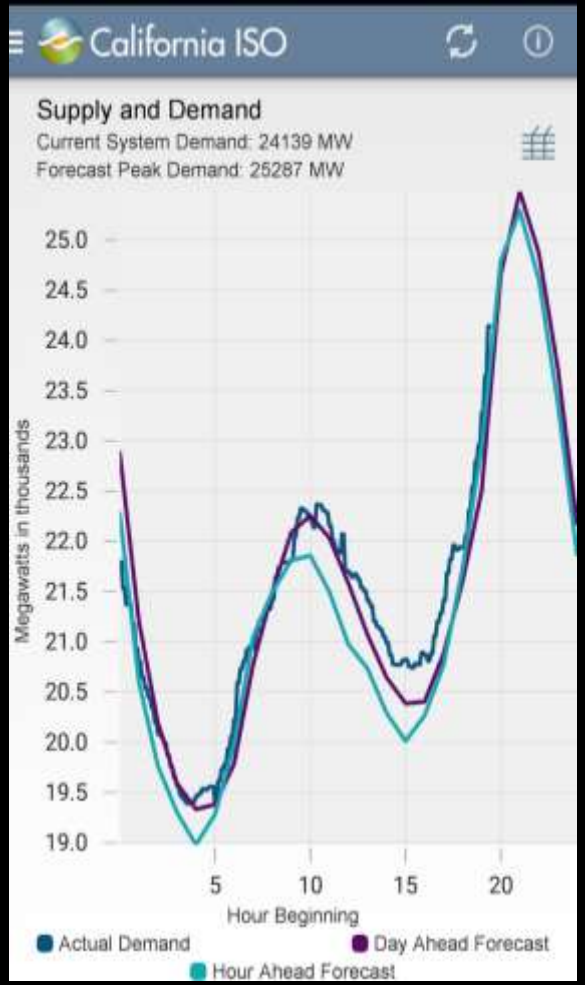
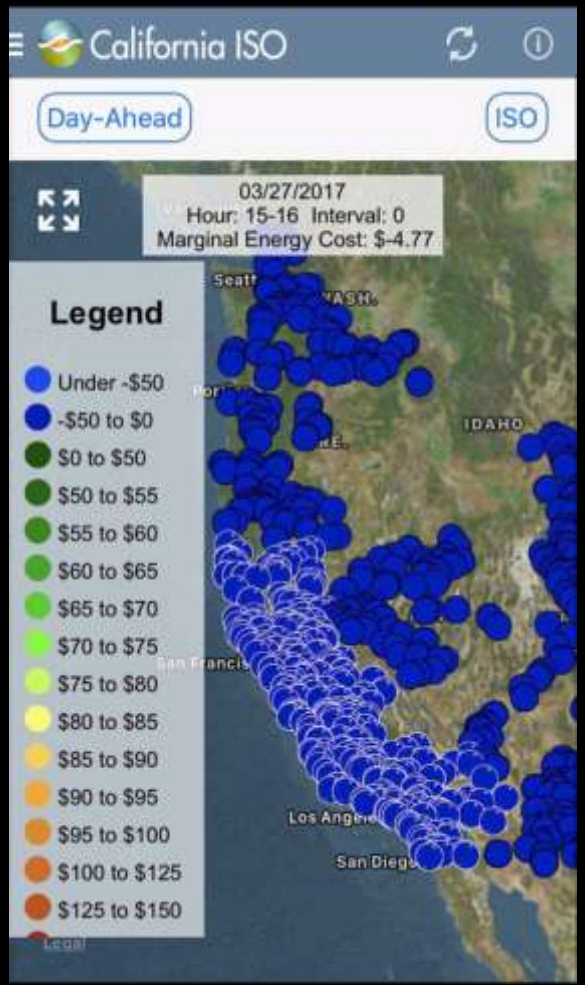
POLL

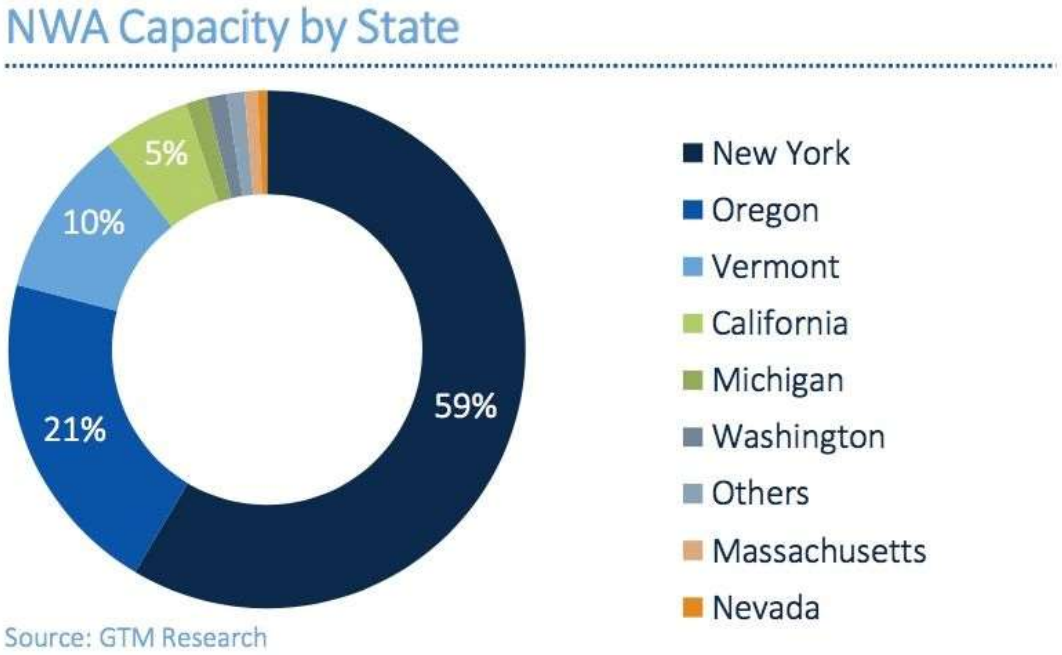
Key Drivers for Pay-for-Performance

The Big Bad Duck: Lots of Renewables but Nobody Buying





Non-Wires Alternatives To T&D Investments



Nontraditional measure aimed at deferring, mitigating or eliminating the need for traditional utility transmission and distribution investments.

Electrification to Decarbonize and Build Load

Declining Electric Loads

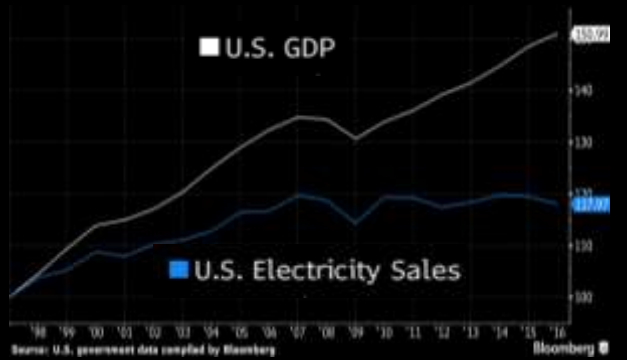
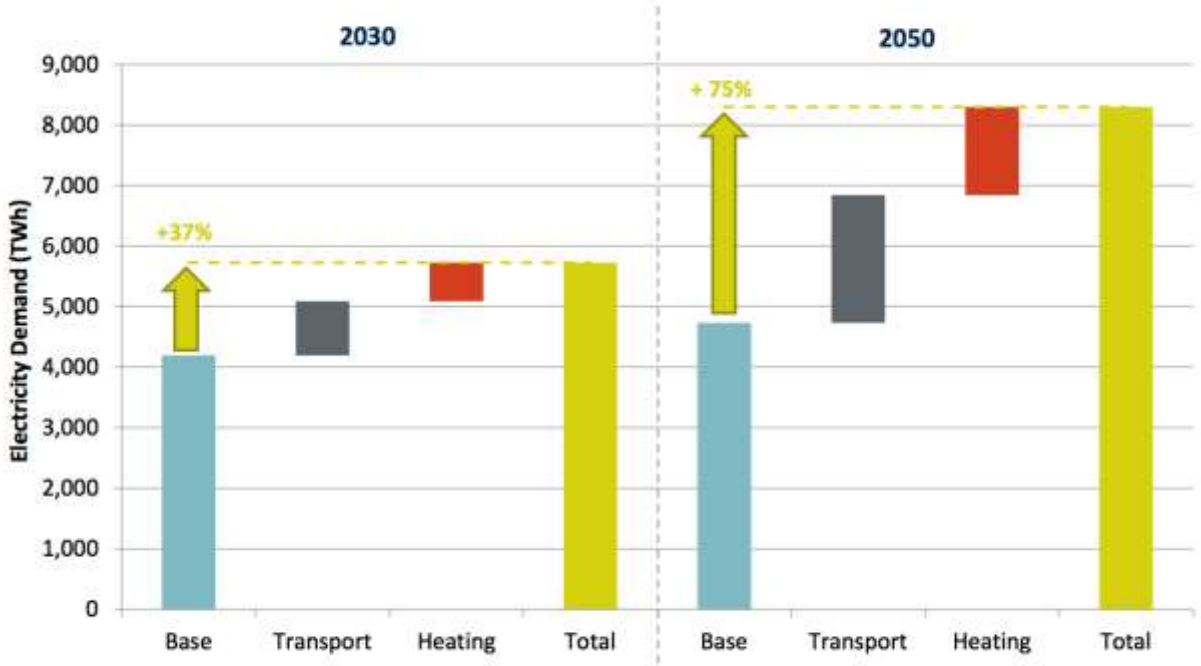


FIGURE 6 Incremental Electricity Sales due to Electrification of Heating and Transport



Source: AEO 2015, NREL 2016, The Brattle Group analysis

What Is the Problem We Need to Solve?

California Average System Emission Intensity

HOUR	1	2	3	4	5	6	7	8	9	10	11	12
1	0.22	0.22	0.19	0.16	0.14	0.14	0.21	0.25	0.25	0.23	0.22	0.23
2	0.22	0.22	0.19	0.16	0.15	0.14	0.22	0.25	0.25	0.23	0.22	0.23
3	0.22	0.21	0.19	0.16	0.15	0.15	0.22	0.25	0.25	0.23	0.22	0.23
4	0.21	0.21	0.19	0.16	0.14	0.14	0.22	0.25	0.25	0.23	0.22	0.22
5	0.21	0.21	0.18	0.16	0.14	0.14	0.21	0.24	0.24	0.22	0.22	0.23
6	0.20	0.19	0.17	0.14	0.13	0.14	0.21	0.24	0.24	0.22	0.21	0.21
7	0.19	0.19	0.17	0.14	0.14	0.14	0.20	0.23	0.24	0.22	0.20	0.20
8	0.19	0.18	0.16	0.11	0.09	0.09	0.16	0.17	0.20	0.20	0.18	0.20
9	0.13	0.11	0.10	0.09	0.08	0.08	0.11	0.13	0.13	0.12	0.11	0.13
10	0.11	0.09	0.09	0.08	0.08	0.08	0.11	0.11	0.12	0.10	0.10	0.11
11	0.10	0.09	0.09	0.08	0.08	0.08	0.10	0.11	0.11	0.10	0.10	0.11
12	0.10	0.09	0.09	0.08	0.08	0.08	0.10	0.11	0.11	0.10	0.10	0.10
13	0.10	0.09	0.09	0.08	0.08	0.08	0.10	0.11	0.11	0.10	0.10	0.11
14	0.10	0.09	0.08	0.08	0.08	0.08	0.11	0.12	0.12	0.10	0.10	0.11
15	0.11	0.09	0.08	0.08	0.08	0.07	0.12	0.13	0.13	0.10	0.11	0.12
16	0.16	0.11	0.09	0.08	0.08	0.08	0.13	0.15	0.15	0.12	0.17	0.18
17	0.19	0.18	0.13	0.09	0.09	0.09	0.14	0.16	0.17	0.16	0.18	0.19
18	0.17	0.17	0.15	0.12	0.10	0.10	0.14	0.16	0.17	0.16	0.17	0.17
19	0.17	0.16	0.14	0.11	0.10	0.10	0.15	0.17	0.18	0.16	0.17	0.18
20	0.17	0.16	0.14	0.12	0.11	0.11	0.14	0.17	0.19	0.17	0.18	0.18
21	0.18	0.18	0.15	0.12	0.11	0.11	0.16	0.19	0.20	0.19	0.18	0.19
22	0.20	0.19	0.16	0.13	0.11	0.11	0.17	0.20	0.22	0.21	0.20	0.21
23	0.22	0.21	0.18	0.14	0.12	0.12	0.18	0.22	0.24	0.22	0.21	0.22
24	0.22	0.21	0.19	0.15	0.13	0.13	0.20	0.24	0.25	0.23	0.22	0.23

Resource Curve Distribution

HOUR	1	2	3	4	5	6	7	8	9	10	11	12
1	0.12	0.07	-0.01	-0.07	0.01	0.08	0.11	0.08	0.00	0.01	0.01	0.04
2	0.04	0.07	-0.02	-0.09	0.02	0.04	0.09	0.05	-0.07	-0.02	0.03	0.07
3	0.05	0.04	0.02	-0.04	0.00	0.00	0.03	0.02	-0.02	-0.02	0.05	0.02
4	0.06	0.06	0.02	0.00	-0.04	0.03	0.01	0.02	-0.02	-0.03	0.03	0.05
5	0.06	0.07	0.01	-0.01	-0.01	0.02	0.00	0.02	0.02	-0.01	0.01	0.07
6	0.04	0.00	0.03	-0.04	0.01	0.01	-0.01	-0.05	0.00	0.00	0.03	0.03
7	0.03	0.01	0.00	0.02	0.00	-0.01	0.03	-0.02	-0.03	0.00	0.04	0.03
8	0.05	0.04	0.03	0.03	0.03	0.03	0.01	-0.03	0.03	-0.01	0.02	0.04
9	0.11	0.04	0.04	0.03	0.04	0.03	-0.01	-0.01	0.01	0.04	0.04	0.07
10	0.12	0.05	0.08	0.05	0.00	0.01	0.03	0.11	0.09	0.09	0.13	0.10
11	0.09	0.00	0.03	-0.02	0.02	-0.01	-0.02	-0.04	0.01	0.02	0.01	0.10
12	0.04	0.00	0.02	0.00	-0.05	-0.02	0.00	-0.04	-0.03	0.03	0.03	0.06
13	0.03	-0.02	-0.04	-0.07	-0.01	-0.02	0.02	0.01	-0.03	-0.04	-0.01	-0.03
14	0.00	-0.03	-0.04	-0.05	0.01	0.04	0.06	0.01	-0.01	-0.03	-0.03	0.01
15	0.00	-0.01	-0.05	-0.03	0.05	0.06	0.04	0.04	-0.02	-0.01	0.00	0.03
16	0.01	-0.07	-0.06	-0.06	0.04	0.07	0.16	0.11	0.03	0.00	0.00	0.03
17	0.03	-0.04	-0.05	-0.06	0.02	0.12	0.21	0.23	0.10	0.09	0.07	0.10
18	0.04	0.03	0.02	0.00	0.04	0.19	0.21	0.23	0.18	0.13	0.06	0.09
19	0.02	0.05	0.03	0.03	0.11	0.21	0.30	0.31	0.25	0.19	0.10	0.10
20	0.10	0.04	0.02	0.07	0.13	0.31	0.28	0.26	0.20	0.12	0.08	0.06
21	0.09	0.08	0.04	0.01	0.10	0.21	0.31	0.23	0.22	0.10	0.15	0.06
22	0.12	0.05	0.08	0.02	0.13	0.20	0.29	0.25	0.16	0.11	0.04	0.08
23	0.07	0.02	0.07	0.00	0.09	0.16	0.25	0.27	0.19	0.07	0.11	0.12
24	0.11	0.05	0.04	-0.01	0.06	0.09	0.22	0.13	0.11	0.03	0.04	0.04

Resource Curve

Time And Locational Savings

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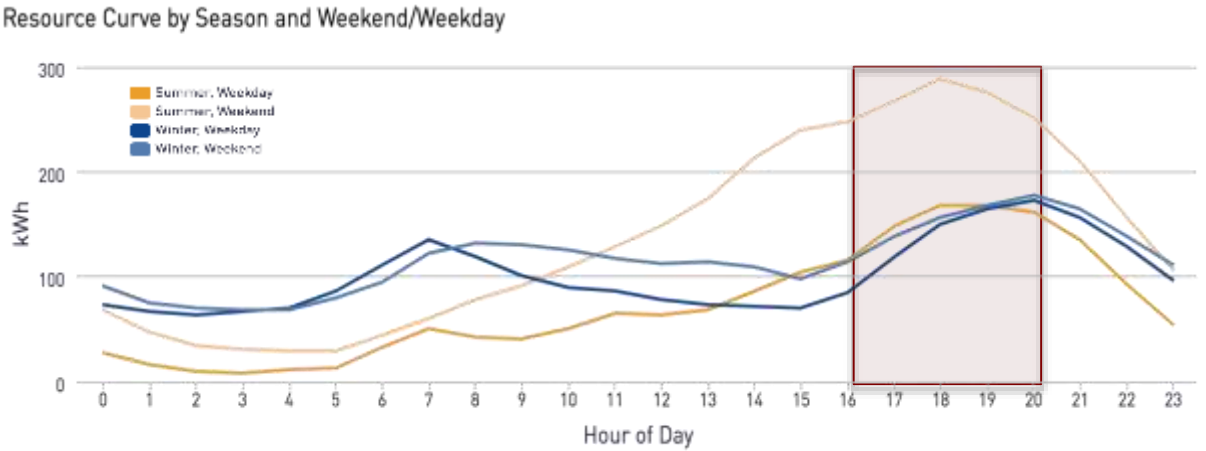
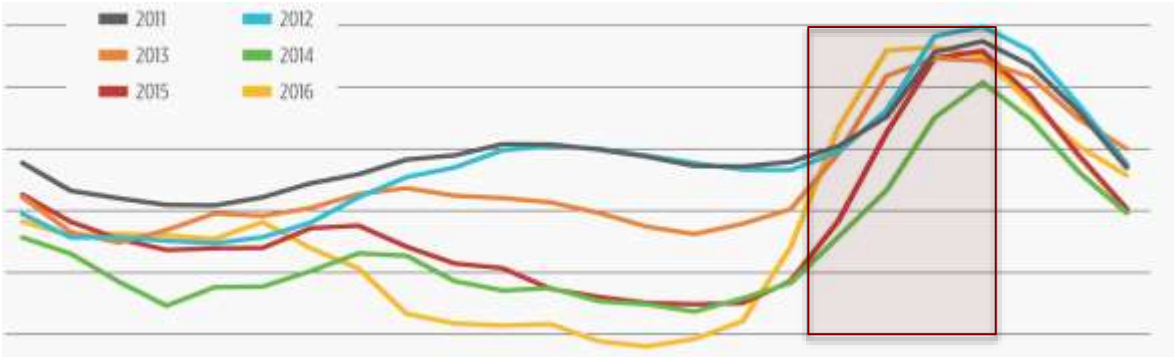
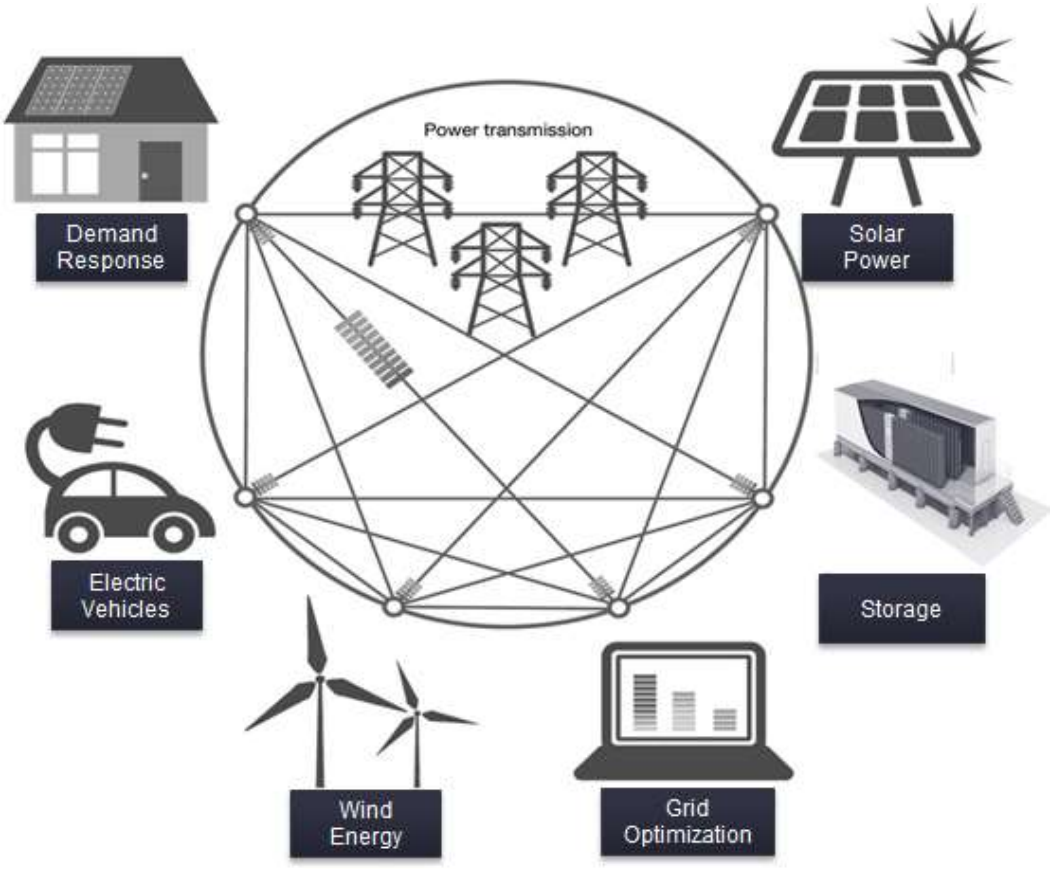
Resource Curve



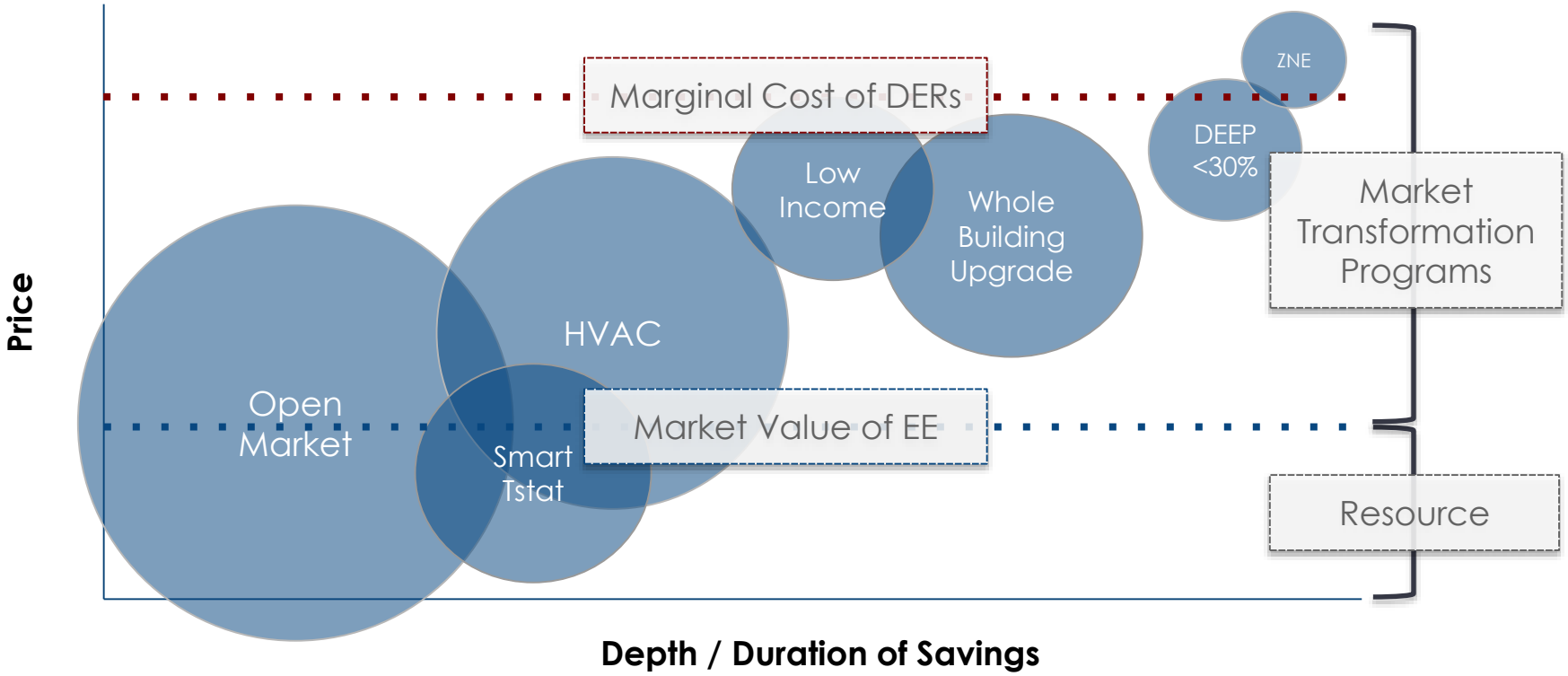
Duck Curve



Fitting Flexible Demand into Distributed Energy Resource Markets



Program Design ➔ Market Design



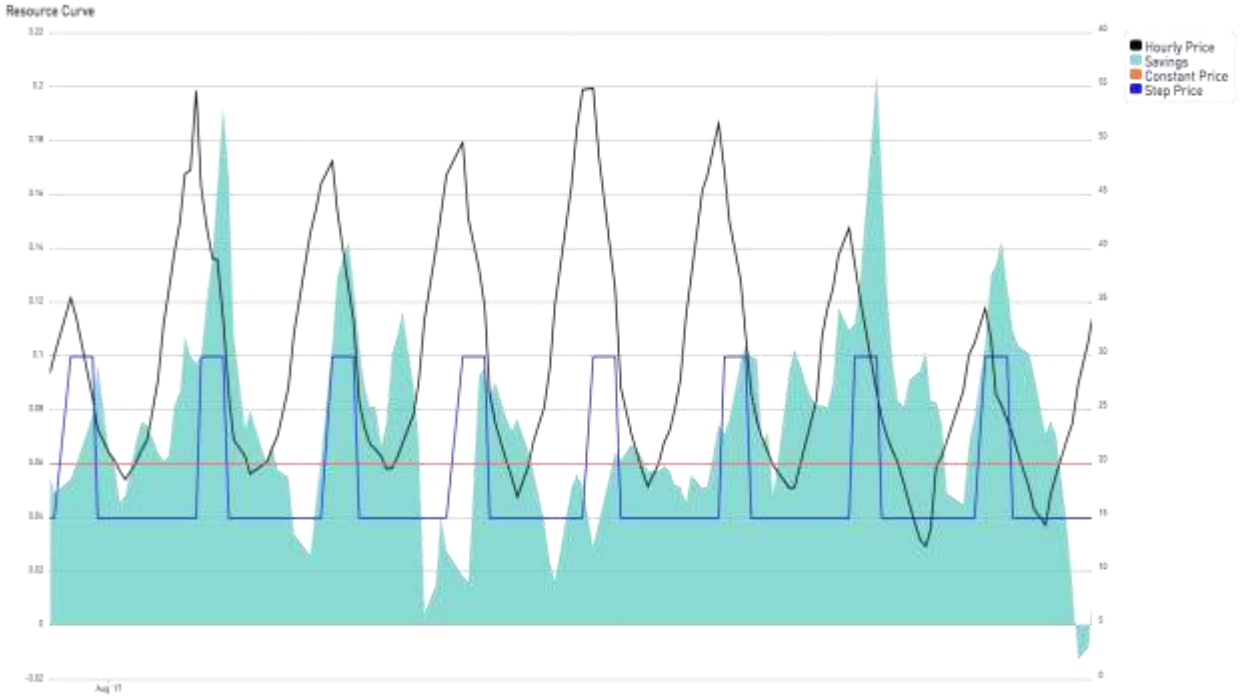
The Future of Pay-for-Performance: Flexible Demand as a Resource

Meter-Based Pay for Performance

Case Study: PG&E Residential P4P

- Performance payments made monthly based on OpenEE Platform running CalTRACK 2.0
- Four (4) Aggregators with varied business models (2 underway, 2 in contracting)
- $25M total payments based on kWh & Resource Curve (time based savings)

Sending the Right Price Signal



- Savings Purchase Agreement (SPA)
- kWh rate + 3x Kicker for savings from 4pm to 8pm
- Payments based on CalTRACK / OpenEEmeter

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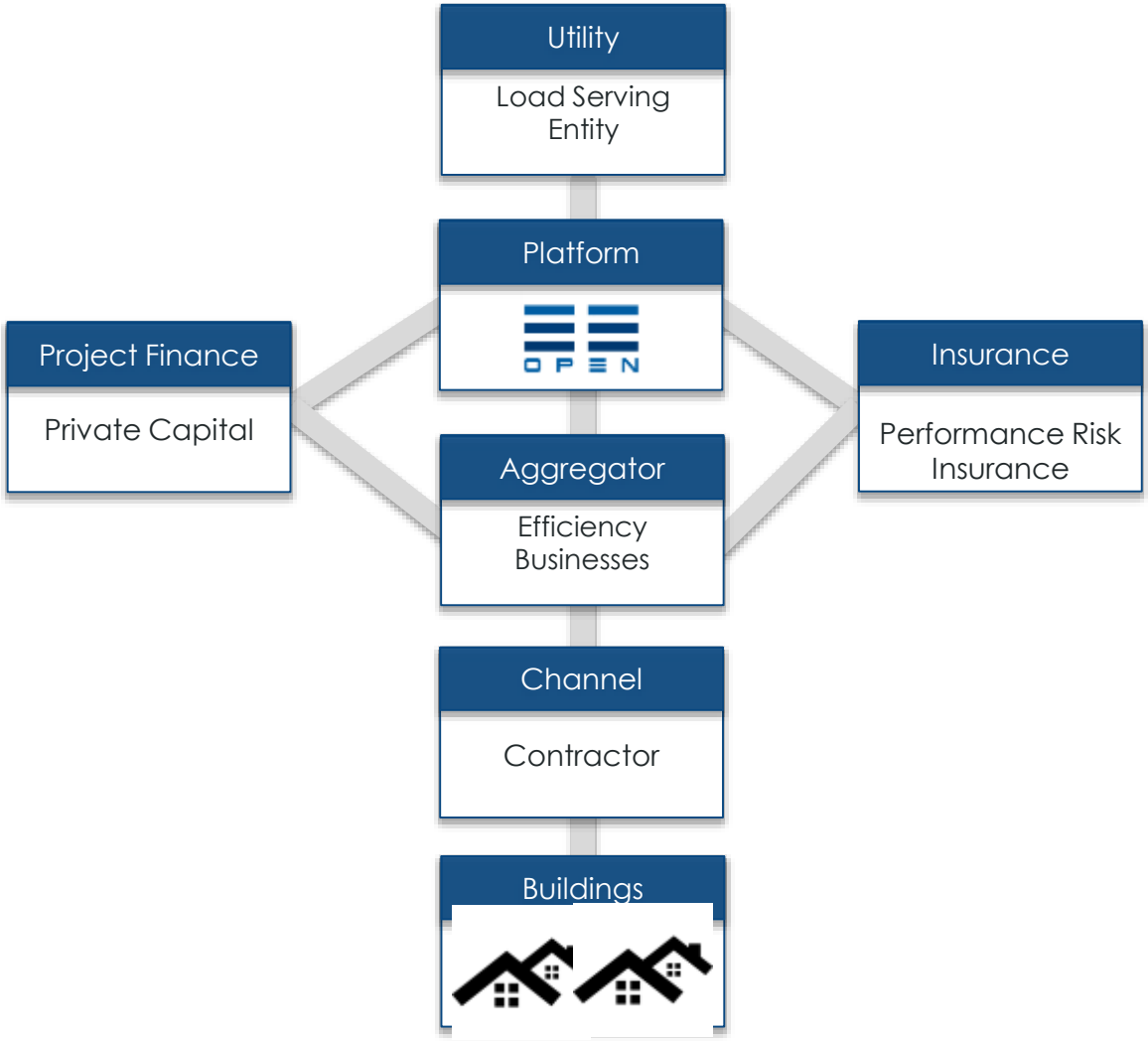
OPEN EE METER

Pay-for-Performance Deal Structure and Financing

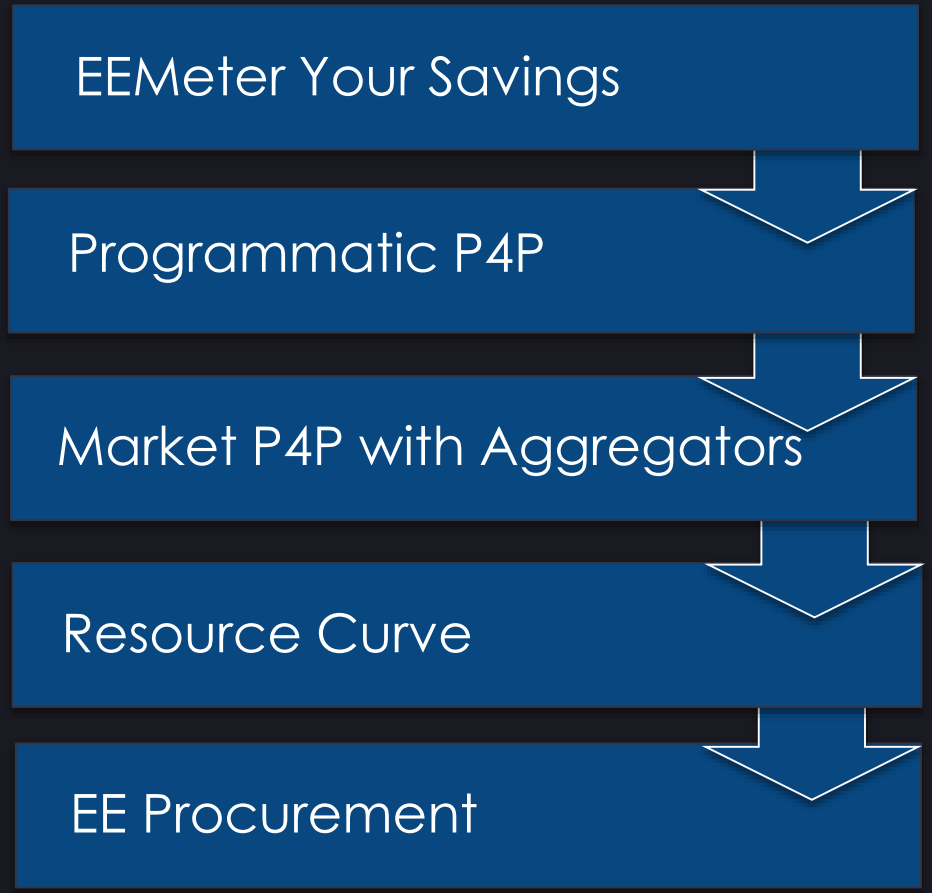


Project Finance: The long-term financing of projects based upon projected cash flows rather than the balance sheets of its sponsors.

Metered Efficiency Performance Insurance

- Savings Performance Insurance based on OpenEEmeter Measurement
- Portfolio-level coverage of efficiency projects
- Underwritten based on actuarial data

Roadmap To Flexible Demand Markets



NYSERDA's Pay for Performance Program

Pilot Phase Approach

- ***Three-phased approach*** of issuing RFPs on an annual cycle during the 2019-2021 timeframe
- NYSERDA is committed to deploying ***$56 million*** over the course of the three phases
- Pilot will rely on an Advanced Measurement and Verification Platform that will use a ***standard savings calculation methodology***
- Phases will seek to ***scale the model*** into other sectors and/or geographies
- Ultimate goal is to ***hand-off the initiative*** to utilities for longer term adoption
- Initial phase will focus on small/medium businesses with ***Con-Ed*** and homeowners with ***National Grid***

Con Edison P4P

- Small and medium commercial customers
- Target market: Westchester County and Staten Island
  - Approximately 70,000 customers (under 300 kW peak demand)
- Pilot will leverage Con Ed strengths and resources
  - Con Ed brand, access to customers, marketing resources and customer engagement channels
  - Customer targeting strategies and data analytics
- Leverage Advanced Metering investments
- Aggregator performance management and payments
- Track and value locational and temporal impacts of portfolios

Target market scales as AMI rollout continues

Total Addressable Market

All Con Edison customers in service territories with AMI infrastructure

Total Achievable market

Customers with AMI infrastructure in Staten Island and West Chester

Pilot market potential

SC 2+9 AMI customers in Staten Island and West Chester with sufficient baseline record

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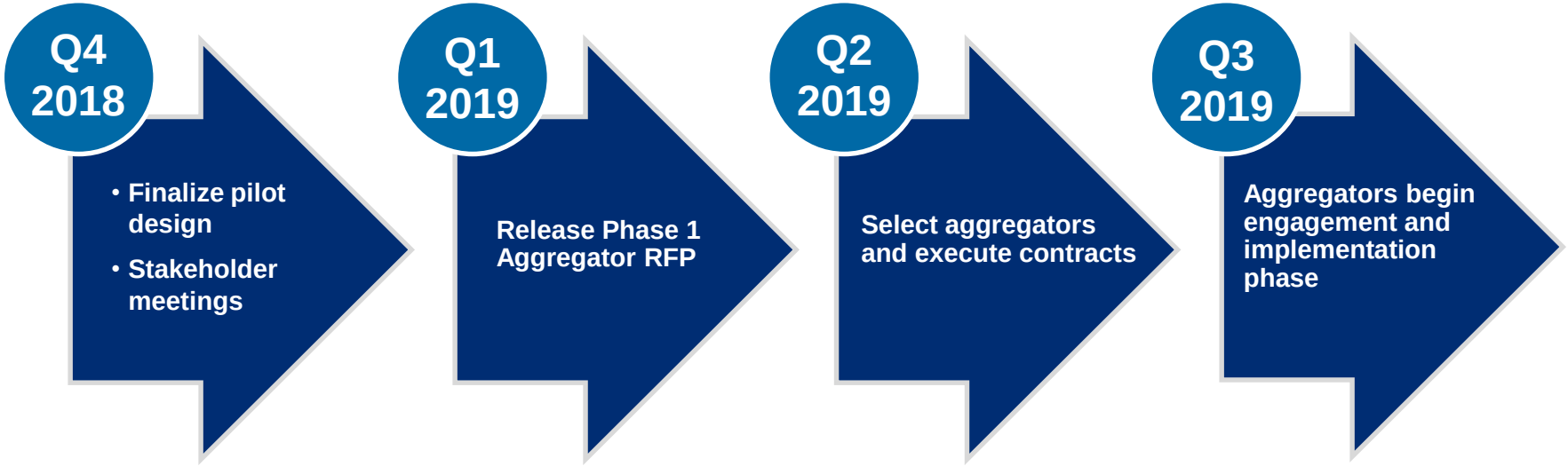
Advanced M&V Solution

NYSERDA is in the process of competitively securing a technology solution to support P4P. The solution will:

- Consistently and transparently measure meter-level energy savings
- Employ a standardized, automated M&V method (CalTRACK) to ensure aggregators are appropriately compensated for delivered energy savings
- Provide visualizations and data to NYSERDA, utilities, and aggregators to build confidence and manage risk
- Develop data transfer protocols with and ultimate hand-off the platform to a utility model

Timing


Q4 2018
• Finalize pilot design
• Stakeholder meetings
Q1 2019
Release Phase 1 Aggregator RFP
Q2 2019
Select aggregators and execute contracts
Q3 2019
Aggregators begin engagement and implementation phase

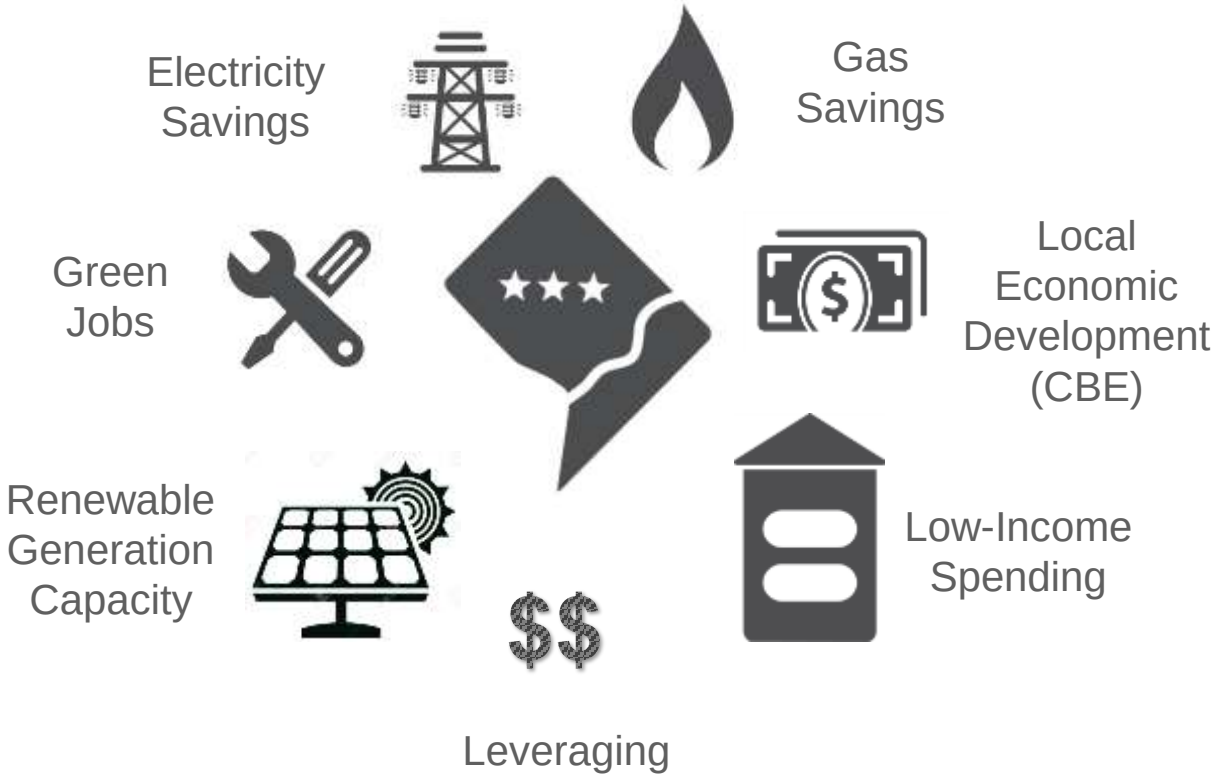
DC SUSTAINABLE ENERGY UTILITY

Pay for Performance in the District of Columbia

Patti Boyd
DCSEU Senior Technology Strategist

October 15, 2018

The DC Sustainable Energy Utility
DCSEU



DCSEU Pay for Performance Timeline/History

- <FY17 - Annual contract not favorable to P4P
- FY17 – FY18 - Develop P4P pilot/plan
- FY18 - Approval to move forward with P4P plan
- Next steps:
  - Oct 19th - Release RFP seeking “Preferred Pay for Performance Partners”
  - Start issuing P4P Incentive Agreements to customers

DCSEU P4P Objectives

- Buildings >100,000 ft^2
- Leverage advances of metering and controls technology
- Influence customers to strive for additional savings
- Engage where traditional estimation methods are unable to predict expected savings or require extensive resources to do so:
  - Duct sealing, envelope improvements, pneumatic to digital control, multiple interactive measures

DCSEU P4P Lessons Learned

- Internal stakeholder buy-in
- Data access/quality varies greatly between customers – having sufficient data before analysis is a priority
- Customer buy-in (waiting for an incentive)
- Vendor management –
  - DCSEU has limited resources
  - Vendors try to sell using DCSEU incentives

Thank you

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Questions?


POLL

Upcoming Events

- Northeast Strategic Energy Management Collaborative Workshop – Nov 6 in Burlington, VT
- M&V 2.0 Workshop – Nov 7 in Burlington, VT
- HELIX Summit – Dec 7 in Providence, RI

More information at http://www.neep.org/events

Thank you!