Is Pay for Performance Performing?

10/11/19

Welcome!

Is Pay for Performance Performing?

Giselle Procaccianti, NEEP
Elizabeth Titus , NEEP

Poll Question 1

Webinar Logistics

- Please enter Audio pin
- NEEP will be unmuting attendees at beginning of call
- Please mute yourself when not speaking (*6)
- NEEP may mute you if there is background noise
- Feel free to communicate via chat box on the sidebar

Slides will be circulated following call

Agenda

1) **Overcoming Energy Efficiency Challenges with P4P** *(10 mins)*
   Jonathan Budner, Franklin Energy

2) **Revolutionizing Energy Efficiency Programs with P4P** *(10 mins)*
   Carmen Best, Recurve

3) **Lessons learned from existing P4P programs** *(20 mins)*
   Julia Szinai, University of California, Berkeley
   Patti Boyd, DC Sustainable Energy Utility (DCSEU)
   Zoe Dawson, Vermont Energy Investment Corporation (VEIC)

4) **P4P program evaluation requirements** *(10 mins)*
   Sarah Caster, Energy Trust

5) **Conclusions** *(5 mins)*
   Giselle Procaccianti, NEEP

Questions?

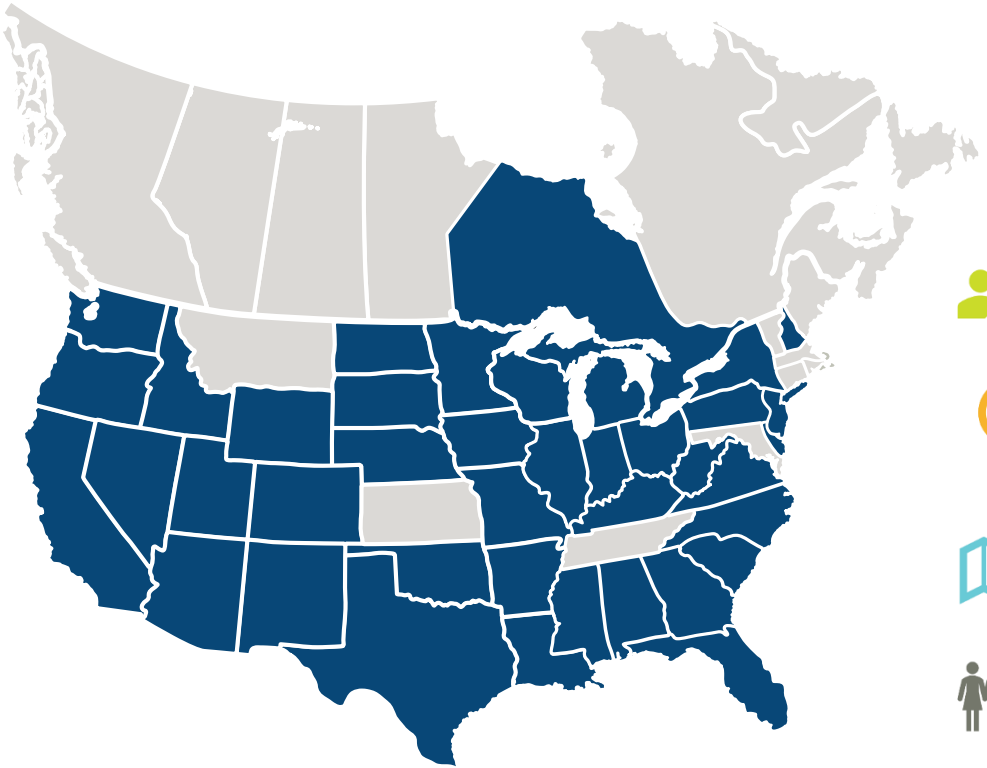
Please type them in the chat box.

Jonathan Budner

Director, Business Development

11 October 19

The Franklin Energy Story



150+ utility clients

500+ utility programs

63 offices across US and Canada

1,200+ employees

PG&E

FRANKLIN ENERGY

Build It Green

Cool Savers

Qualification

*Because Franklin takes the financial risk, program is limited to **high-potential customers,** as measured by AMI data from previous 12 months, based on shoulder to peak season, among other metrics*

NMEC

*Normalized Metered Energy Consumption (NMEC) generates weather-adjusted energy usage from YoY against this **actual energy performance.** Implementers gets paid per peak/off-peak BTU.*

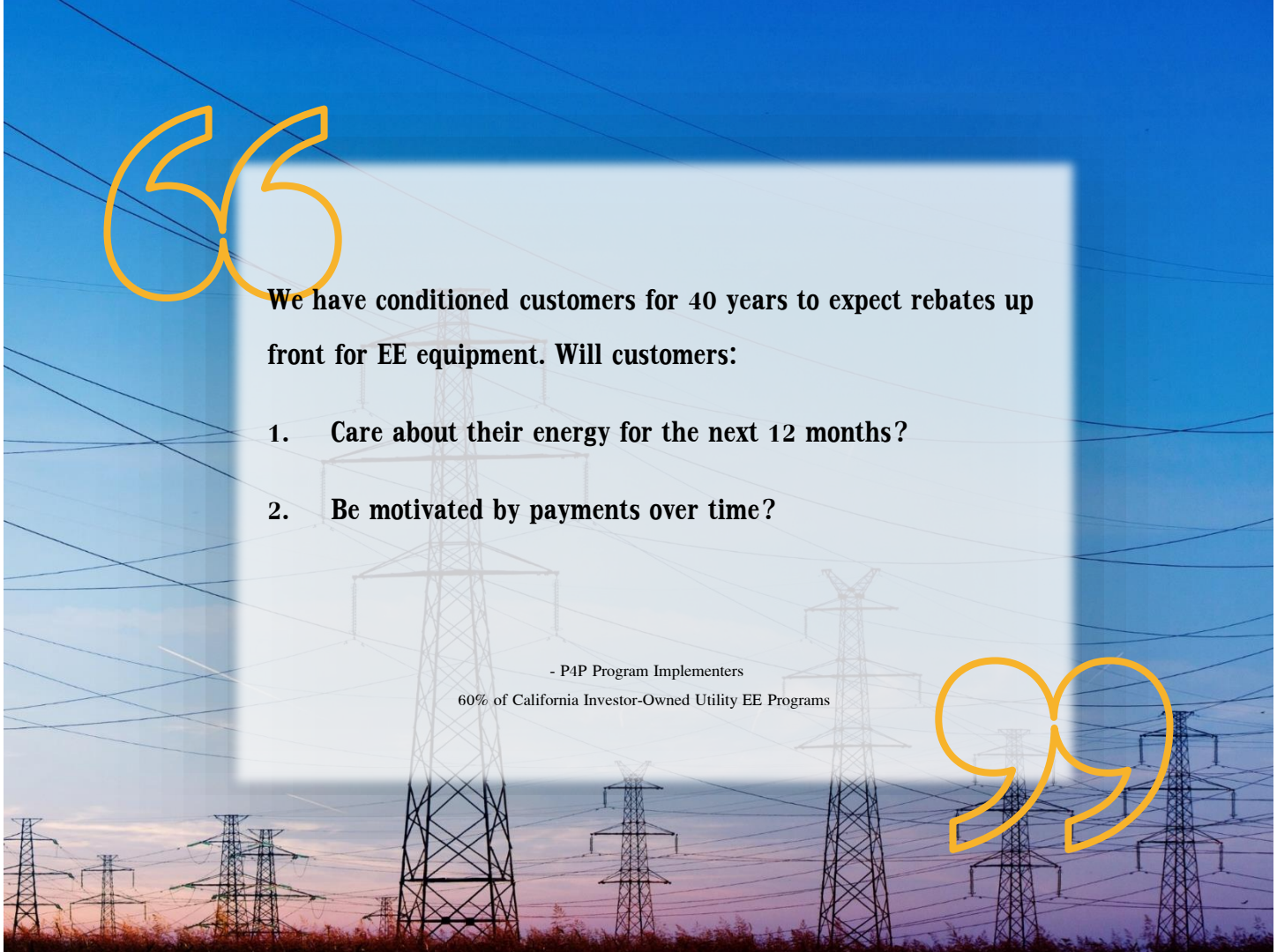
Sector

*Single-family, detached homes with no solar, no EVs, and **no other program participation** in previous 12 months or future12 months.*

Comprehensive

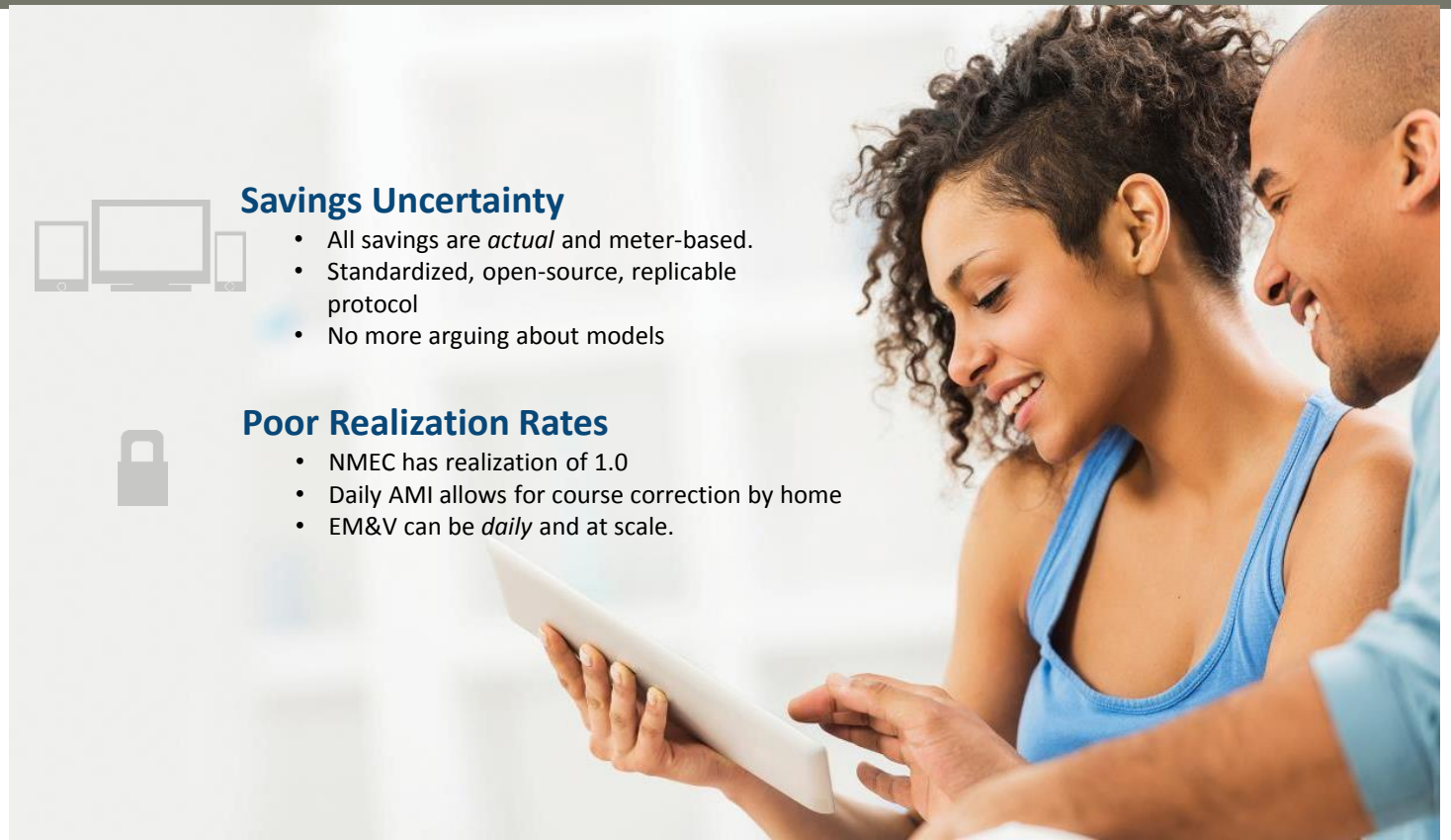
Scope is from LEDs/aerators to full HVAC system replacement. The greater the percentage of HVAC upgrades the more valuable to the utility and to Franklin

The P4P Challenge


We have conditioned customers for 40 years to expect rebates up front for EE equipment. Will customers:
1. Care about their energy for the next 12 months?
2. Be motivated by payments over time?
- P4P Program Implementers
60% of California Investor-Owned Utility EE Programs

Challenges

Cool Savers



Savings Uncertainty

- All savings are *actual* and meter-based.
- Standardized, open-source, replicable protocol
- No more arguing about models

Poor Realization Rates

- NMEC has realization of 1.0
- Daily AMI allows for course correction by home
- EM&V can be *daily* and at scale.

Challenges

Cool Savers

Challenge: Grid Impacts

- NMEC saving *are* grid savings
- Can be reported as frequently as AMI and processing allow
- Can be reported by location and time

Draining Rebate Budget

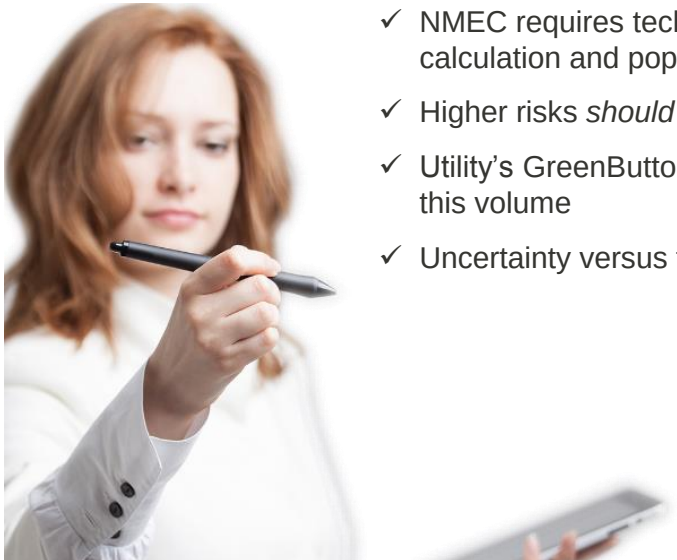
- Pay Implementers for NMEC savings
- Paces spend over 12 months, or per contract
- Puts risk on the implmementers.

AM Conservation Group

Challenges

Cool Savers

Lessons Learned



- ✓ Manage financial risk to implementer
- ✓ For cash flow, utility payment terms are critical
- ✓ NMEC requires technical partner for savings calculation and population analysis
- ✓ Higher risks *should* mean higher returns
- ✓ Utility's GreenButton systems were not designed for this volume
- ✓ Uncertainty versus future growth

Thank you!

FRANKLIN ENERGY

Jonathan Budner
Director, Business Development
jbudner@franklinenergy.com
323-905-2453

RECURVE
SHAPE THE FUTURE OF ENERGY

Performance as a Resource

Pathways to Scale

Carmen Best
Director of Policy & Emerging Markets
carmen@recurve.com

CALTRACK

- Standard M&V Calculation Methods
- Monthly, Daily, and Hourly
- Public Stakeholders Empirical Process
- www.CalTRACK.org

LF ENERGY
OPENEEMETER

- Python CalTRACK Engine
- Open Source Apache 2.0
- How It Works: https://goo.gl/mhny2s
- Code Repo: https://goo.gl/qFdW4P

LF ENERGY

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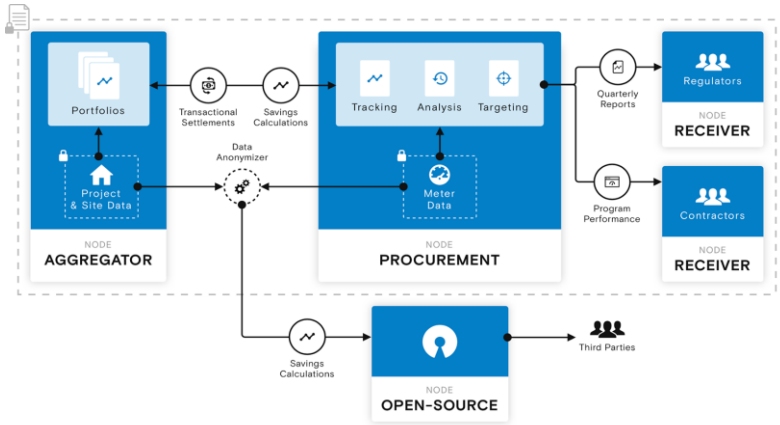
Recurve SaaS Platform

- Telemetry, Targeting, and Analytics
- CalTRACK Compliant
- SaaS “OpenEEmeter Inside”
- Data Pipeline (ETL)
- Secure, Encrypted, and Scalable

Distributed Nodes



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Meter-Based Pay-for-Performance

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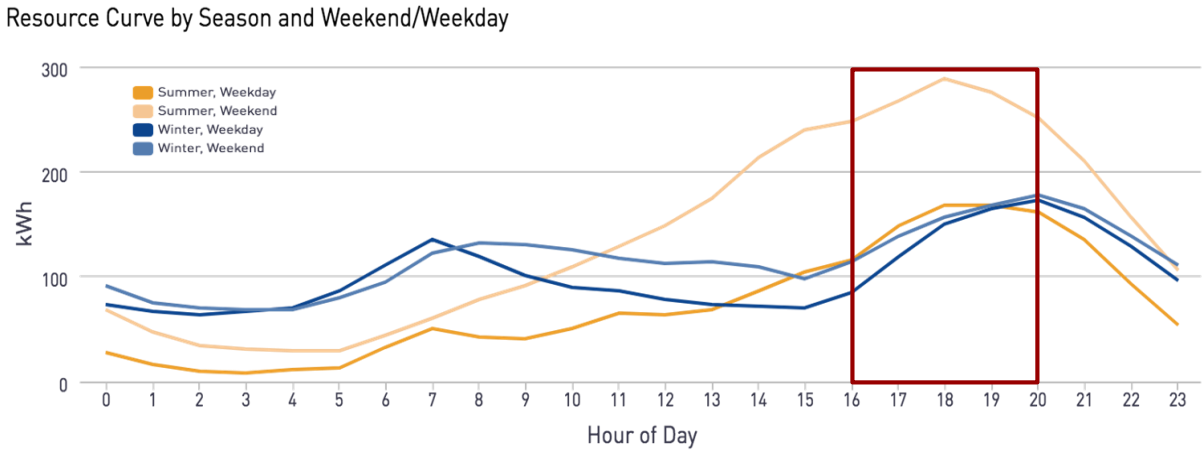
What is Meter-based Pay-for-Performance?

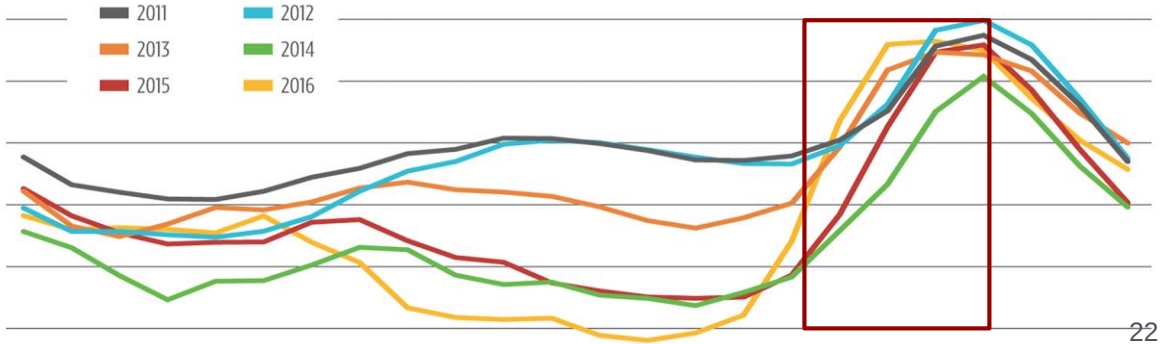
- Whole building analysis at customer meter
- Hourly interval meter data enables time valuation
- Aggregated portfolio savings are the basis of payment not individual buildings
- Performance settlement is between administrators and aggregators not direct settlement with customers

Sending the Right Price Signal

Resource Curve



Duck Curve



Track Carbon Reductions Hourly

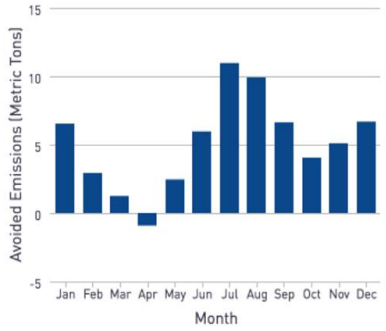
FILTERS (1) ▾ **Portfolio** Weatherization

45	0.207	0.09	436
Portfolio Avoided GHG Emissions [Metric Tons]	Avoided Emissions Factor [Metric Tons/MWh Saved]	Participant Avoided GHG Emissions [Metric Tons]	Participant Normal Year kWh Savings

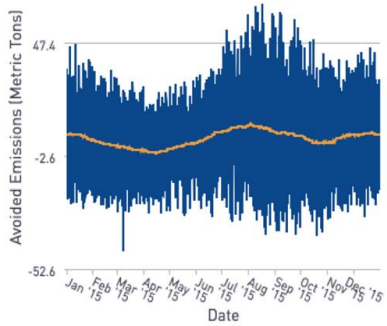
Avoided Electric GHG Emissions (Kilograms Carbon)

HOUR	1	2	3	4	5	6	7	8	9	10	11	12
1	14.1	8.3	-1.4	-6.4	1.0	8.8	14.6	10.1	0.4	2.8	1.2	5.3
2	4.2	7.5	-1.5	-5.1	1.8	5.8	11.1	6.9	-9.1	-3.3	4.2	9.9
3	5.5	4.8	2.3	-3.6	-0.4	0.6	4.1	2.9	-3.0	-2.8	5.5	2.5
4	8.0	6.8	0.9	-0.8	-3.6	2.5	1.9	3.3	-3.1	-3.9	0.2	6.6
5	8.0	8.7	1.2	-0.8	-0.6	1.8	0.2	3.3	2.8	-0.9	1.8	8.4
6	3.8	1.0	2.9	-4.1	0.7	0.9	-1.6	-6.9	-0.1	0.5	3.5	3.5
7	3.3	1.8	-0.2	2.1	0.6	0.0	2.7	-2.8	-4.9	-0.4	5.2	3.7
8	5.5	4.1	3.0	2.5	1.8	2.5	1.1	-3.3	3.8	-0.6	2.0	6.9
9	10.7	5.2	3.1	1.6	3.9	1.8	-0.7	-1.3	0.8	7.4	4.5	7.4
10	10.9	3.6	5.3	3.6	-0.2	0.9	3.5	10.2	9.7	8.6	13.3	9.7
11	8.5	0.0	2.2	-1.7	1.0	-0.4	-1.9	-3.6	0.6	1.4	1.5	9.1
12	3.6	0.2	1.3	0.2	-3.2	-1.5	0.2	-3.3	-2.6	2.7	2.7	5.0
13	2.7	-1.9	-2.8	-4.2	-1.1	-1.4	1.6	0.8	-2.9	-3.5	-1.0	-2.8
14	-0.3	-2.3	-3.1	-3.2	0.4	2.4	4.9	0.3	-0.7	-2.9	-2.8	1.1
15	0.0	-0.6	-3.1	-1.6	3.1	3.5	2.9	3.6	-1.9	-0.6	0.4	2.7
16	1.4	-6.0	-4.6	-3.9	2.7	4.6	12.6	9.0	3.3	-0.6	0.2	3.6
17	3.6	-4.1	-4.4	-4.5	1.3	7.3	16.4	19.9	9.8	8.7	8.1	10.9
18	4.4	3.2	1.7	0.0	2.7	12.5	17.5	20.6	18.4	13.6	6.6	9.5
19	2.2	4.2	3.0	1.9	7.3	13.6	25.8	29.2	26.1	19.8	11.3	11.1
20	11.0	3.7	2.3	4.6	9.2	22.5	26.3	27.1	22.3	12.6	8.9	7.3
21	9.2	9.0	4.0	1.2	7.5	15.2	30.4	26.1	26.8	11.7	18.3	6.3
22	15.0	6.0	7.5	1.4	10.2	17.3	31.8	31.6	21.4	14.1	7.8	10.1
23	8.6	2.2	6.9	0.4	8.1	14.3	30.1	36.4	26.2	9.2	14.2	15.2
24	13.2	5.1	3.6	-1.7	4.9	7.8	27.7	18.0	15.2	3.6	4.9	7.4

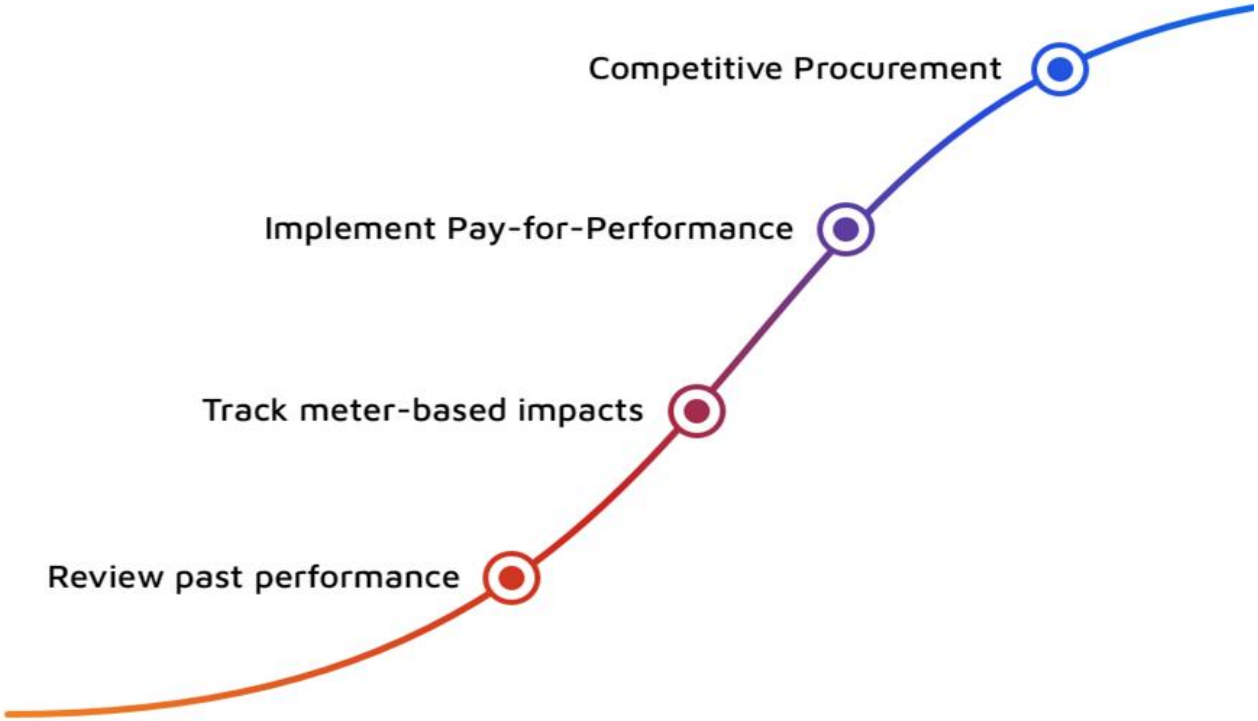
Avoided GHG Emissions By Month (Metric Tons)



Hourly Avoided GHG [Drag to Zoom]



A Path to Scaling Efficiency



Pathways to Meter-Based Pay-for-Performance

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Three Generic Categories of Adoption

Market Focus

Large scale pilot with focus on market development

New York: *Business Energy Pro, a Pay-for-Performance initiative*

Executive direction for grid level improvements, coupled with State Authority leadership

Scaled Pilots & 3P

Large scale pilots and third-party procurements

California: *Pacific Gas & Electric Residential Pay-for-Performance, and Third-party Solicitations*

Legislation, regulatory authorization, and utility administrator leadership

Contractor Focus

Step-wise testing with contractors delivering existing programs

Oregon: *Energy Trust Pay-for-Performance Pilot*

Third-party administrator initiative coupled with Governors executive order

Policy Pathways to Meter-Based Pay for Performance, IEPEC 2012

Table 2. Similarities and Difference in Establishing Pay for Performance

	New York: NYSERDA/ConEd Business Energy Pro	**California:** Pacific Gas & Electric Residential	**Oregon:** Energy Trust Pay for Performance Pilot
Automated M&V platform for performance payment	✓	✓	✓
Offer solicitations for market vendors to propose new program designs	✓	✓	O
Offer existing program vendors modification to payment structure	O	O	✓
Market outreach to shape program design	✓ (public input)	O	✓ (current contractors)
Rules and guidelines established at the program/initiative level	✓	✓	✓
Regulatory rules and guidelines	O	✓	O

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Policy Pathways to Meter-Based Pay for Performance, IEPEC 2019

Early Lessons Learned

Market Focus

- Coordination required
- Data standards
- Limits of tools and models
- Input from market actors is critical
- Test to create broad learnings to enable utility adoption at scale

Scaled Pilots & 3P

- Diversity and creativity
- Implementer business models are shifting
- Impact analysis enables adaptation
- Embedded M&V adopted w/ or w/o P4P
- Savings claims still pending guidance

Contractor Focus

- Familiarity with M&V tools is the focus
- Incremental adjustment allows for discrete questions
- Reconciliation of methods
- Stress points to applying meter-based methods at scale

Policy Pathways to Meter-Based Pay for Performance, IEPEC 2012

Staged Creation of Market Environment

Step 1	Step 2	Step 3	Step 4	Step 5
Get legislative, regulatory, or utility to **commit to pay-for-performance, via meter-based savings,** as central to achieving goals.	Designate an agency or entity to **deploy staged pilots at scale** to build market experience and work through enabling rules / infrastructure.	Adopt **open & transparent, meter-based measurement & verification methods** such as CalTRACK to set consistent expectations for measuring performance.	Issue **solicitations for meter-based pay-for-performance as a primary path** for capturing changes in consumption, & track performance.	Leverage insights and intelligence gained in the process and from others to **initiate, iterate and improve**.

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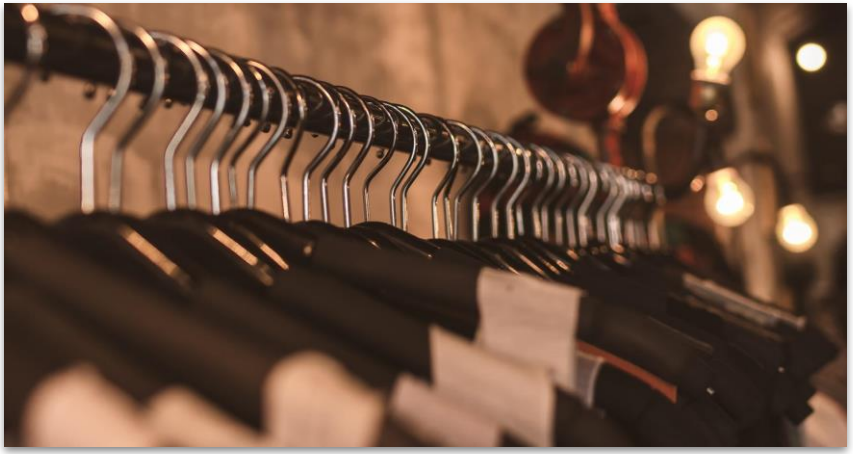
Policy Pathways to Meter-Based Pay for Performance, IEPEC 2019

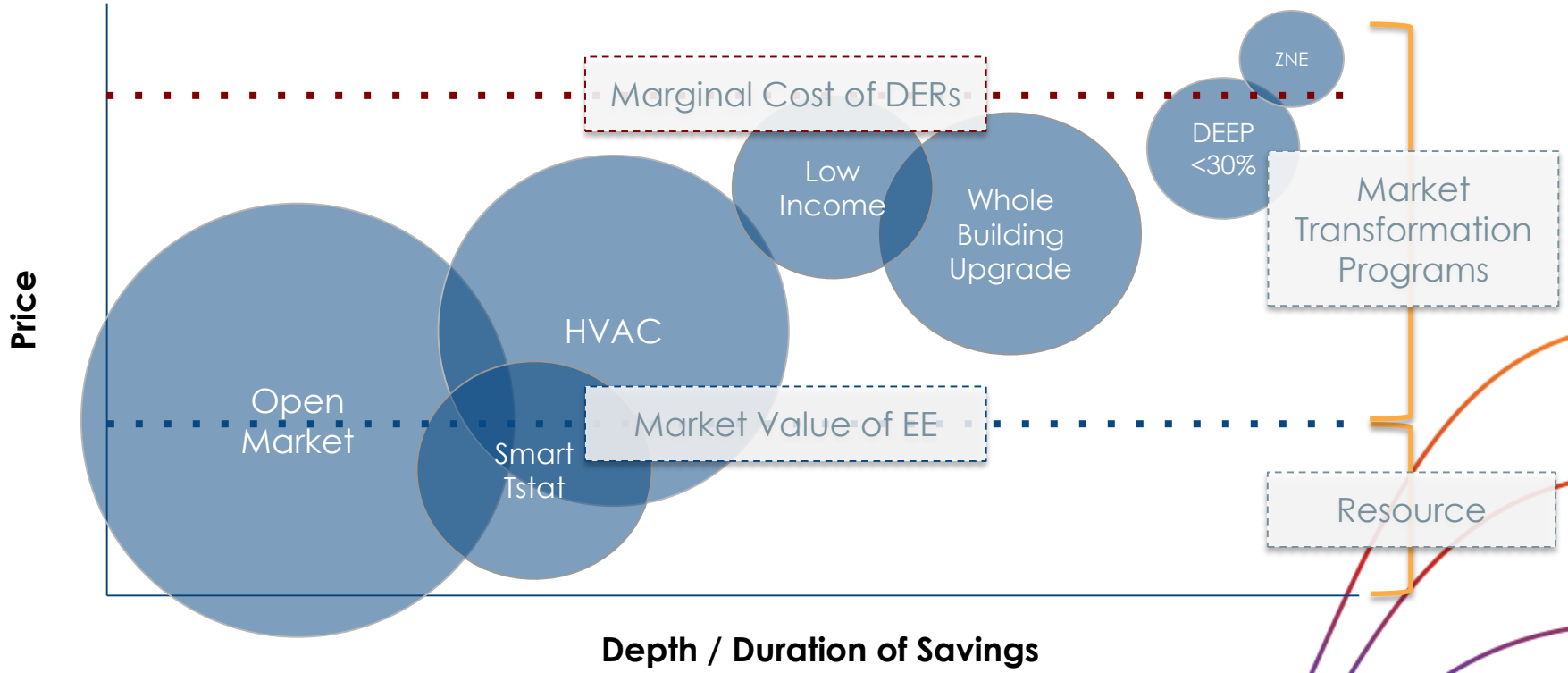
One size does not fit all

(But it’s close!)



- Market Engagement
- Education & Communication
- Practice through pilots
- Incremental Testing
- Robust evaluation measurement & verification approaches

P4P Flexibility: Program Design => Market Design



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Questions?

carmen@recurve.com

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Appendix: Performance Program Case Studies

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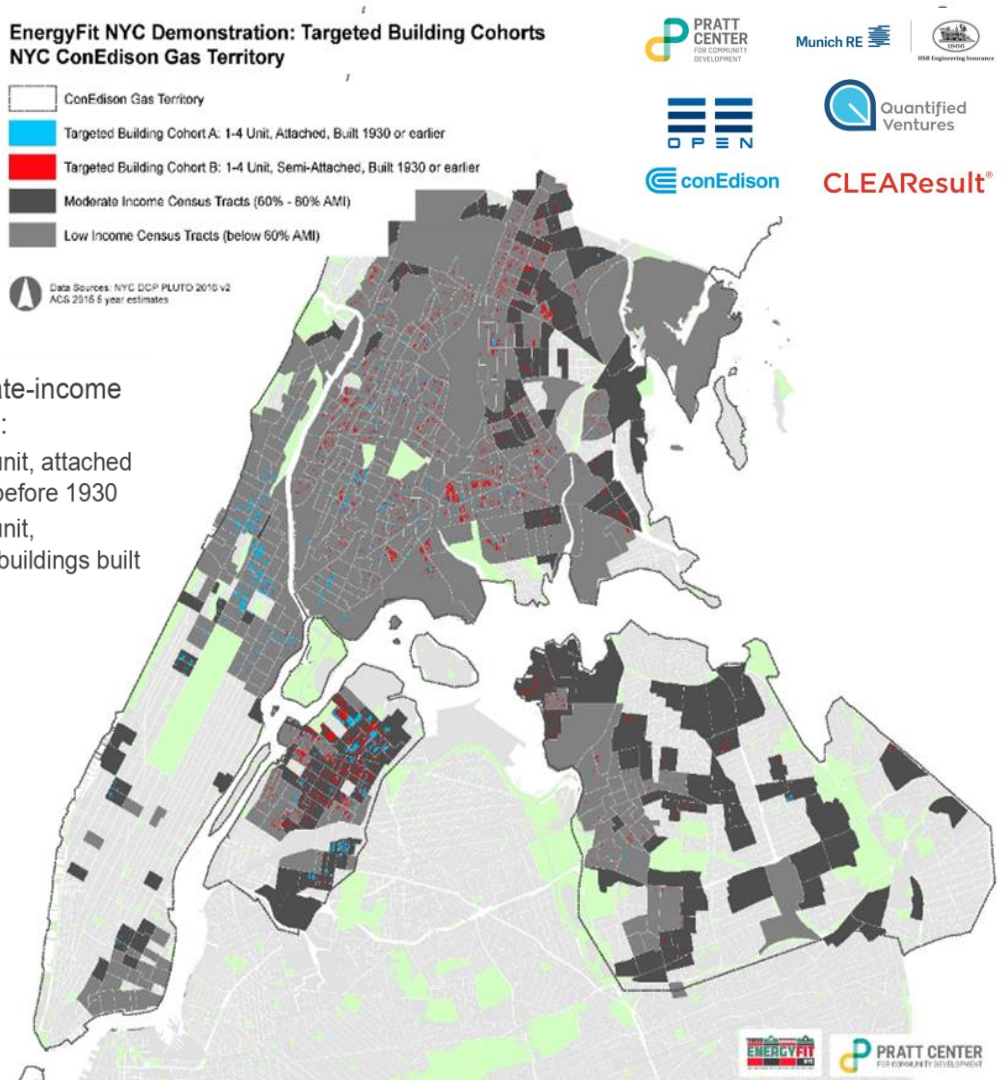
Con Edison EnergyFit LMI P4P Rev Demo



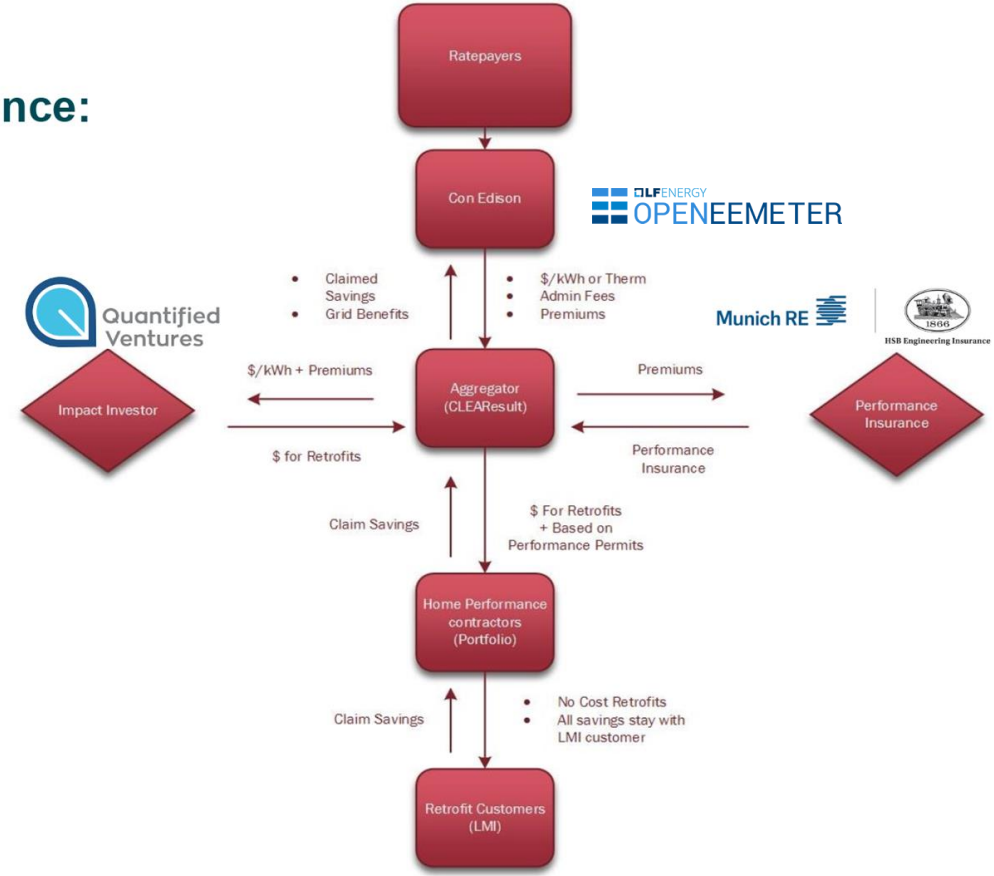
Low- and moderate-income residents living in:

- **Group A**: 1-4 unit, attached buildings built before 1930
- **Group B**: 1-4 unit, semi-attached buildings built before 1930

Con Edison EnergyFit LMI P4P Rev Demo

Project Finance:

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



CASE STUDY

PG&E P4P: Residential

- Performance payments made monthly based on OpenEEmeter running CalTRACK 2.0
- Four (4) Aggregators with varied business models
- $25M total payments based on kWh & Resource Curve (time based savings)

Unparalleled flexibility to pursue a range of improvements and activities over time to achieve residents' savings goals

Retrofit

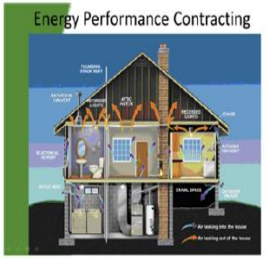
- Whole House
- HVAC
- Lighting
- Outdoor/Pool Deck

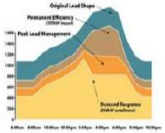
Operational

- Smart Thermostats
- Home Energy Management Systems
- Smart Appliances

Behavioral

- Homeowner Incentives
- Demand Response
- Other specially designed programs





CASE STUDY

PG&E P4P: Residential

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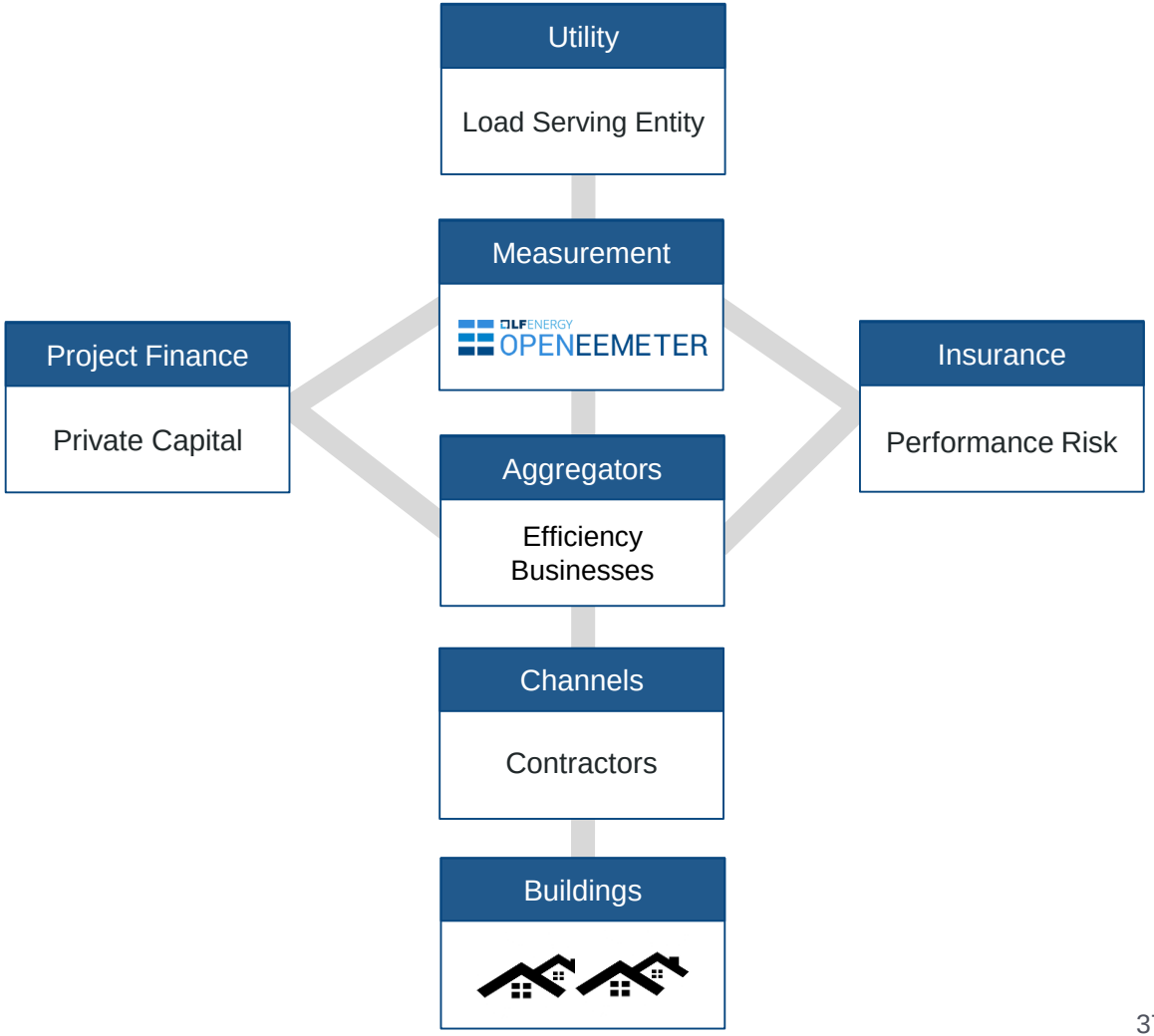


Energy Efficiency in California Is Moving to 3rd Party Programs

Energy Savings Acquisition

Delivering, or supporting the delivery, of the most cost-effective savings possible from the target market.

Hard-To-Reach Customers & Disadvantaged Communities

Addressing the unique barriers and proving benefits of Hard-to-Reach Customers and Disadvantaged Communities.

Market Transformation

Creating long-lasting sustainable changes in the market by reducing barriers to EE adoption and advancing next generation technologies and approaches.

EE as a Grid Resource

Providing measurable, verifiable energy savings aligned and targeted to the right time and location of grid needs.

4 – Grid Resource (3 of 3)

- In addition, to better align the benefits of the EE portfolio with the dynamic operations of the grid and position EE programs to be a significant contributor to the emerging Distributed Energy Resources ("DER") market, PG&E is requesting Grid Resource program designs that:
  - Are informed by data that reflects the needs of the grid which varies by the time of day, the time of year, and geographic location on the grid
  - Can target the right customers with the right measures at the right time and the right location

Geographic Alignment	Delivery Window	Meter-Based
	• Savings Delivery Windows – programs that are able to align energy savings to the unique delivery window for each DPR are preferred. Bidders should utilize this data to build an effective program design (i.e. within a defined planning region, target the appropriate customers with the appropriate measures to deliver savings within the savings delivery window specified for that planning region).	• Preference for programs that utilize AMI customer data to support near real-time M&V ("M&V 2.0") and deliver verified energy savings and/or capacity that can be substantiated to a specific time and geographic location.

Putting Your Money Where Your Meter Is

A Study of Pay-for-Performance Energy Efficiency Programs in the U.S.

Julia Szinai, UC Berkeley

Northeast Energy Efficiency Partnerships, P4P Webinar

October 11, 2019

Berkeley
UNIVERSITY OF CALIFORNIA

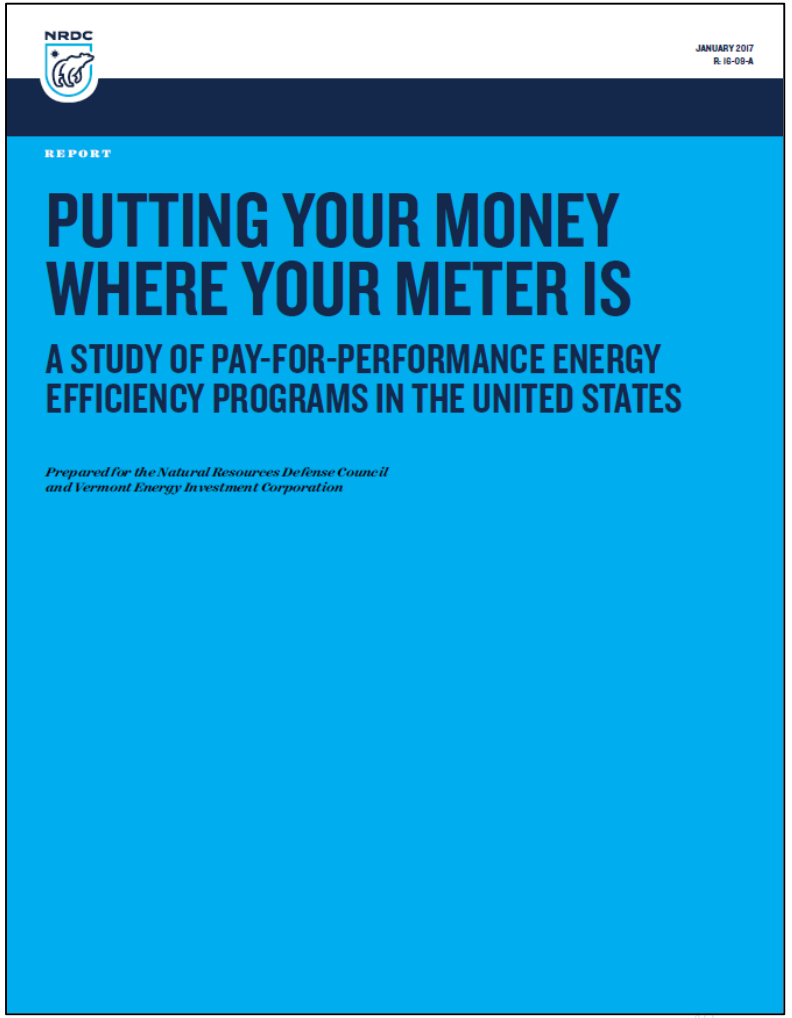
NRDC
NATURAL RESOURCES DEFENSE COUNCIL

Vermont Energy Investment Corporation

Agenda

- Overview of P4P program features
- Lessons learned and recommendations from P4P case studies

Download the Issue Brief and Report here: https://www.nrdc.org/resources/putting-your-money-where-your-meter

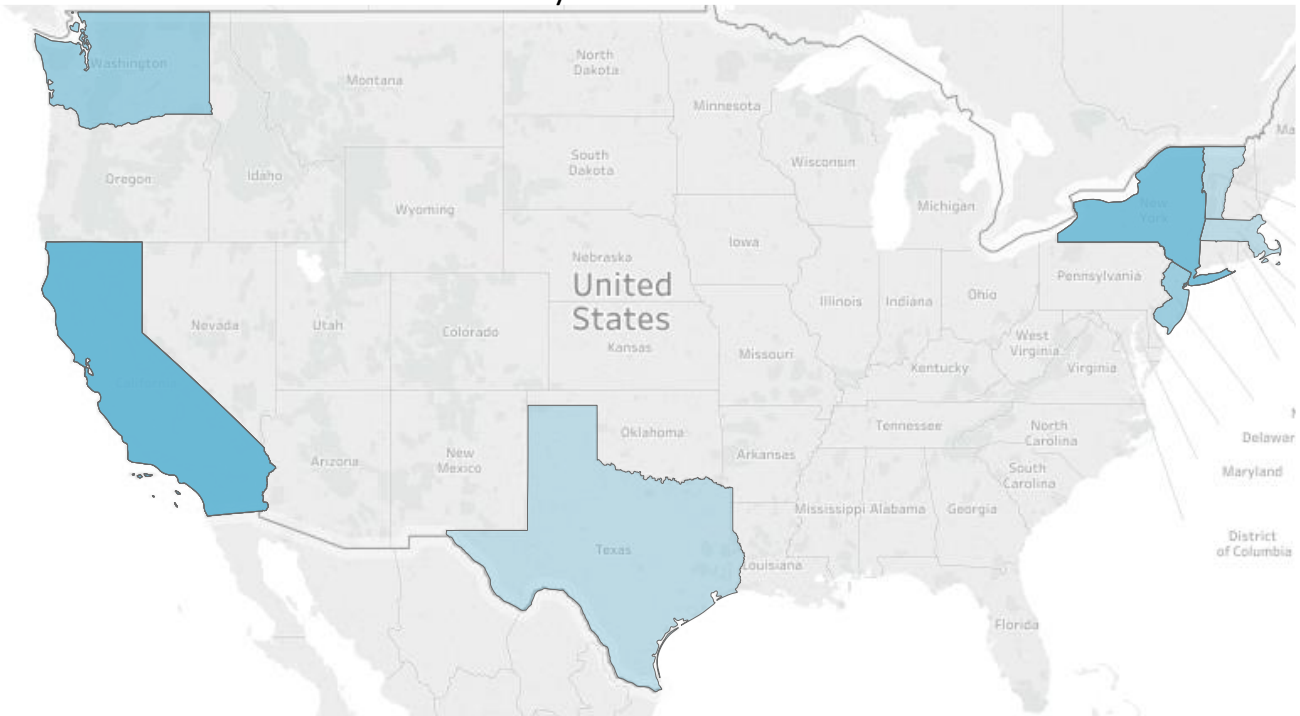


P4P not new, but little understanding of past experiences and potential upsides and pitfalls

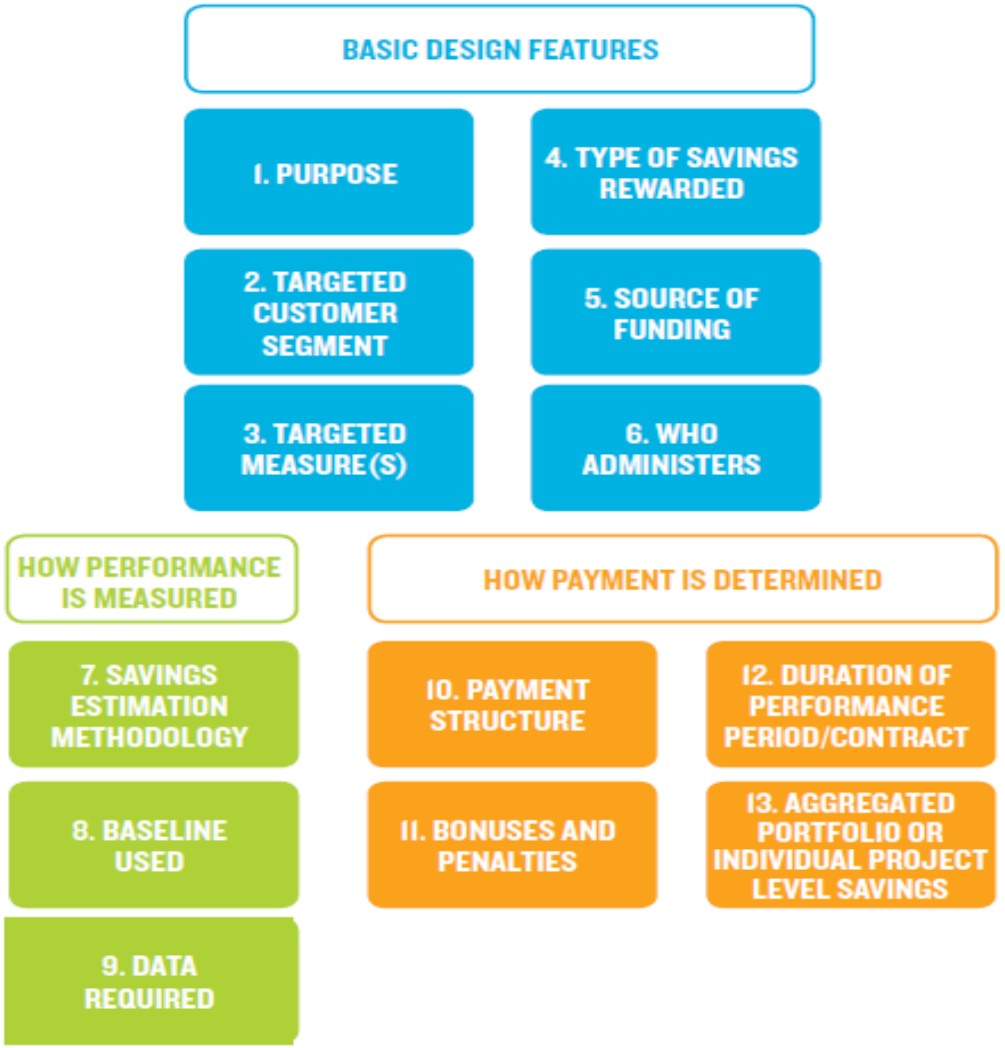
Report analysis of key elements and lessons learned from:

- 21 case studies from late 1980s to present across U.S.
- 24 expert interviews

P4P Case Study Locations Across the US



Analysis of Case Studies through P4P Taxonomy Framework



Basic Design Features – *Findings from Case Studies*

Program motivation:

- Determines the M&V, EE measures, payment structure

Targeted sector:

- Almost all commercial sector, some industrial, few examples in residential

Targeted measures:

- First gen programs mainly lighting, newer programs have multiple measures including operational/behavioral savings.

Basic Design Features – *Recommendations*

Avoid "cream-skimming" and encourage deeper savings:

- Minimum savings requirements
- Tiered incentives
- Requirements for multiple measures

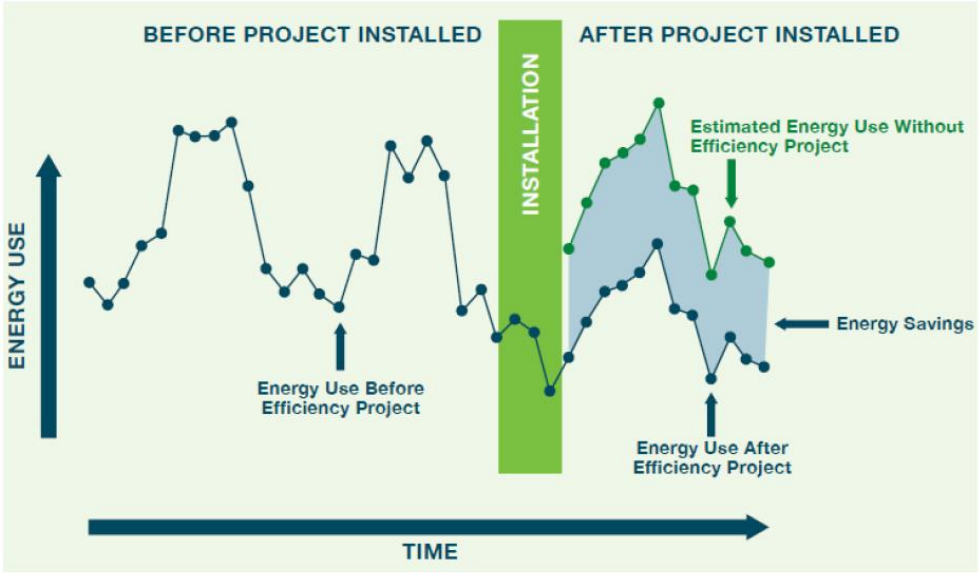
Image source: pge.com

How Performance Is Measured – *Findings from Case Studies*

Range of Savings Estimation Methods:

- 7 of 21 cases used normalized meter/bill data to estimate savings, enabling multi-measure retrofits and operational savings

- Even with best models, some buildings are difficult to predict



State and Local Energy Efficiency Action Network. 2012.

How Performance is Measured – *Recommendations*

To improve accuracy and certainty of savings estimates:

- Screen out unpredictable buildings
- Estimate for a portfolio of buildings
- Have a backup savings estimation methodology

To streamline M&V and reduce costs:

- Performance metrics to compare savings models
- Standardize and agree in advance on methods and data

How Payment is Determined – *Findings from Case Studies*

Incentive Structure:

- Most programs had payments for milestones (installation) and savings performance ($/kWh saved).

Bonuses/Penalties:

- High penalties for programs relying on EE to replace infrastructure; programs with bonuses for higher savings had fewer lighting-only measures.

Duration of Payments:

- Wide range of performance periods from 1 year to 25 years

How Payment is Determined - *Recommendations*

Mitigate performance risk for customers, implementers, utilities

- Milestones for installation alongside performance incentives
- Quality standards and insurance for EE projects
- Diversified portfolio of buildings

Regular feedback and visibility of savings trajectory

Consider tradeoffs of payment duration

- Longer periods motivate persistence but prolong risk exposure

Overall Policy Considerations - *Potential P4P Applications*

P4P can leverage access to smart meters and improved analytics (M&V 2.0):

- savings from a wider range of EE projects, especially complex, interactive, multi-measure, whole-building efficiency projects

P4P can deliver efficiency as a verified energy or capacity resource

Pge.com

Overall Policy Considerations - *Potential P4P Limitations*

- Not one-size-fits-all approach, especially with unpredictable buildings
- Most programs in commercial sector, less experience in residential, low-income, small business
- If implemented alongside other EE programs, avoid double-dipping incentives or double-counting savings

Thank You!

Download the Issue Brief and Report here:
https://www.nrdc.org/resources/putting-your-money-where-your-meter

Julia Szinai

PhD student researcher

Energy and Resources Group,

Goldman School of Public Policy

UC Berkeley

jszinai@berkeley.edu

Report Contributing Authors:

Merrian Borgeson

Senior Scientist, Energy Program

Natural Resources Defense Council

mborgeson@nrdc.org

Emily Levin

Manager – Program Strategies

VT Energy Investment Corp.

802-540-7694

elevin@veic.org

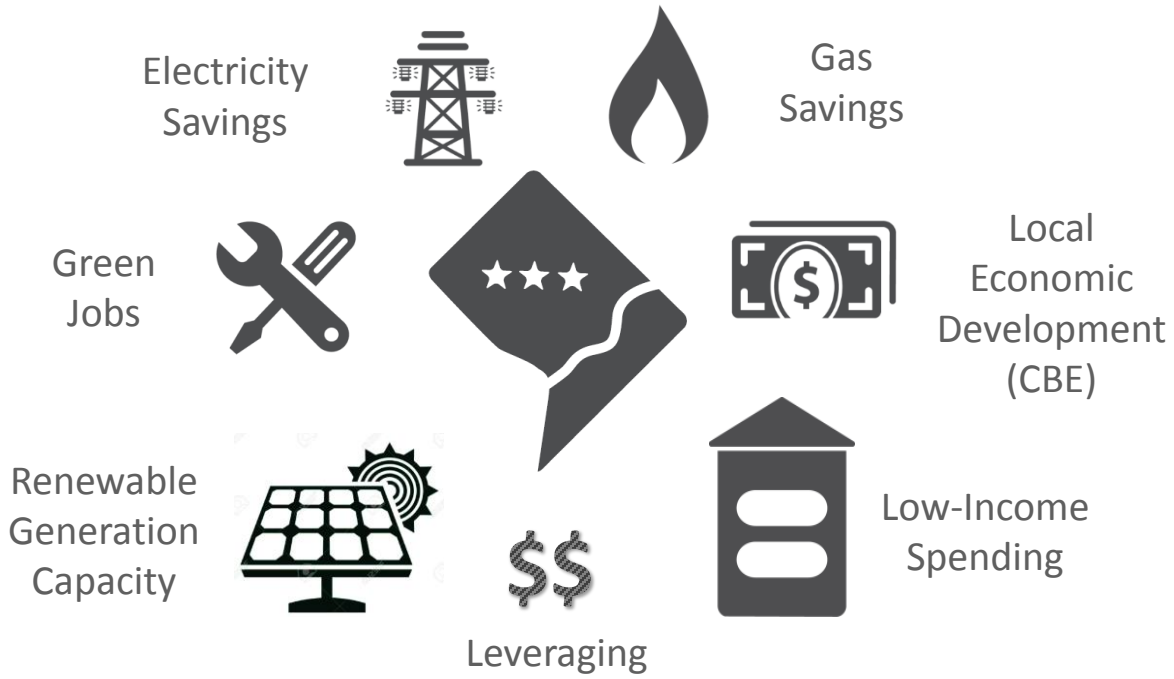
DC SUSTAINABLE ENERGY UTILITY

Pay for Performance in the District of Columbia (Update)

Patti Boyd
DCSEU Senior Technology Strategist

October 11, 2019

The DC Sustainable Energy Utility
DCSEU



DCSEU P4P Timeline/History

FY	Activities
FY 17 – 18	Developed Internal pilot/plan, obtained approval
FY 19	Developed the market: • 4 Preferred Partners enrolled • 3 projects closed • 20 projects underway! • End of year Market Transformation effort
FY20 – 21	Develop pipeline and close projects: • DC Building Energy Performance Standard (BEPS) • Develop baselines for newest projects • Enroll additional Preferred Partners

Lessons Learned

- Vendors –
  - Traditional vs. P4P (applicability of their solution)
  - Complementary solutions– EMIS & energy audits
- Customers –
  - Communication
  - Expectations on required information
  - Multiple simultaneous efforts – regression analysis segmentation
- Internal –
  - Ramp up of data analysis capability

Thank you!

Patti Boyd

pboyd@dcseu.com

11 October 2019

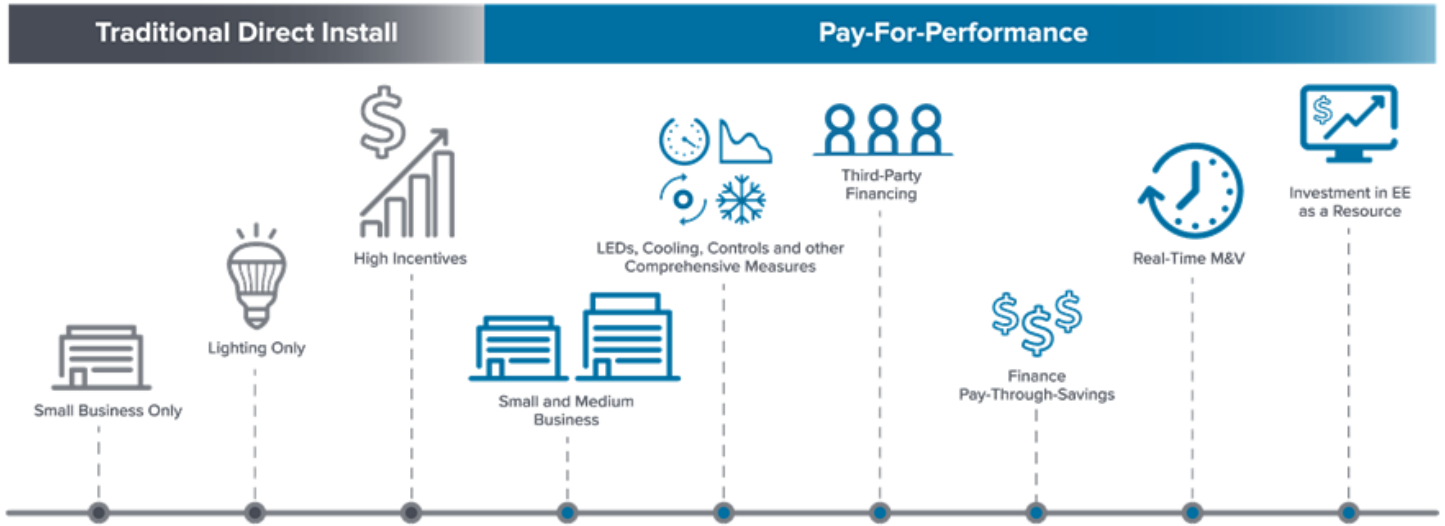
NYSERDA's Pay for Performance Pilots

Zoe Dawson, Senior Consultant VEIC zdawson@veic.org

NYSERDA Pilot Approach

- Issuing RFPs on an annual cycle during the 2019-2021 timeframe for a total of ***three phases***
- NYSERDA is budgeting ***$56 million*** over the course of the three phases
- Savings will be measured using the ***CalTRACK methodology*** via the Recurve platform.
- Phases will seek to ***scale the model*** into other sectors and/or geographies
- Ultimate goal is to ***prove the cost effectiveness*** of the approach and ***hand-off the initiative*** to utilities for longer term adoption

Pay for Performance Evolution



- Implementers are compensated per deemed savings based on TRM
- Prescriptive measures
- Single engagement
- Realized savings unknown until program evaluation

- Implementers are compensated by actual savings based on normalized data
- Comprehensive measures, not limited to TRM
- Longer payment period to incentivize longer customer relationships
- Advanced measurement & verification

Con Edison Business Energy Pro: Commercial P4P Phase 1 Design & Approach

Geography	**Staten Island and Westchester**
Sector	Small/medium business; Service classes 2 and 9 (<300kW)
Utility Data	Advanced metering infrastructure and Green Button will be utilized
Payments	Quarterly for a duration of 3 years; based on normalized metered data plus x2 gas kicker payment during Jan/Feb)
Measures	Measure agnostic; multiple measure packages preferred
Bidding	Levelized bid ceiling of $12/MMBtu
Funding	Approximately $10 million available to Portfolio Managers
Program Overlap	Participating customers may not access utility, NYSERDA, or other publicly-funded incentives for the measures installed through the P4P Pilot

National Grid Home Energy Saving: Residential P4P Phase 1 Design & Approach

Geography	**Onondaga, Oneida, or Oswego counties**
Sector	Single-family (1-4 units) residential; Standard Service Rate SC-1
Utility Data	National Grid will transfer monthly gas and electric data to the AMV Platform
Payments	Quarterly for a duration of 3 years; based on normalized metered data
Measures	Measure agnostic; multiple measure packages preferred
Bidding	Levelized bid ceiling of $14/MMBtu based lifetime savings
Funding	Approximately $6 million available to Portfolio Managers
Program Overlap	Participating customers may not access utility, NYSERDA, or other publicly-funded incentives for the measures installed through the P4P Pilot

Pilot Project Package Requirements

- Multi-measure (bids need to go beyond lighting and lighting controls)
- Reduce baseline electric and/or gas consumption by at least 5% at the meter
- Provide statistical confidence in portfolio results (sufficient number of projects and depth of savings)
- No renewables or energy distortion activities

LIGHTING

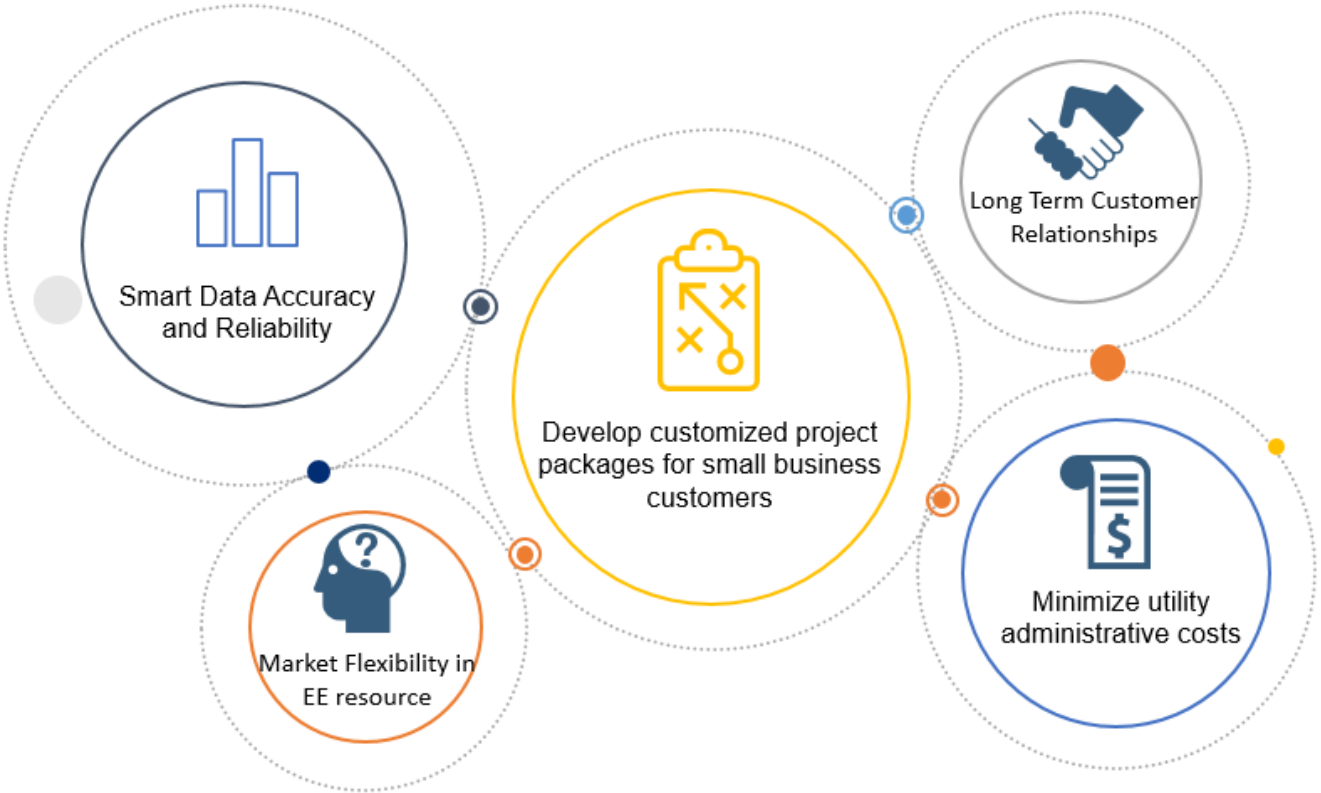
REFRIGERATION

HEATING/COOLING

WINDOW/DOOR

Behavioral

Pay for Performance Design Considerations



Pay for Performance Design Questions

- Customers –
  - Who will be eligible? Who do we want to target?
  - What are mandatory vs. optional requirements for a customer to be eligible? How many eligible customers are needed for a successful pilot? How can we increase the number of eligible customers?

- Portfolio Managers –
  - What qualifications does a PM need? How many PMs are needed for a pilot?
  - How do we ensure PMs will be able to construct large enough portfolios to ensure statistical confidence in savings?

- Pilot Outcomes –
  - What outcomes are we looking to drive? What hypothesis are we looking to test?
  - What savings are we specifically looking to obtain, and how would we incentivize them? Do we have the data and technical infrastructure to support this?
  - What additional market support do you need to provide? How are you going to evaluate success?

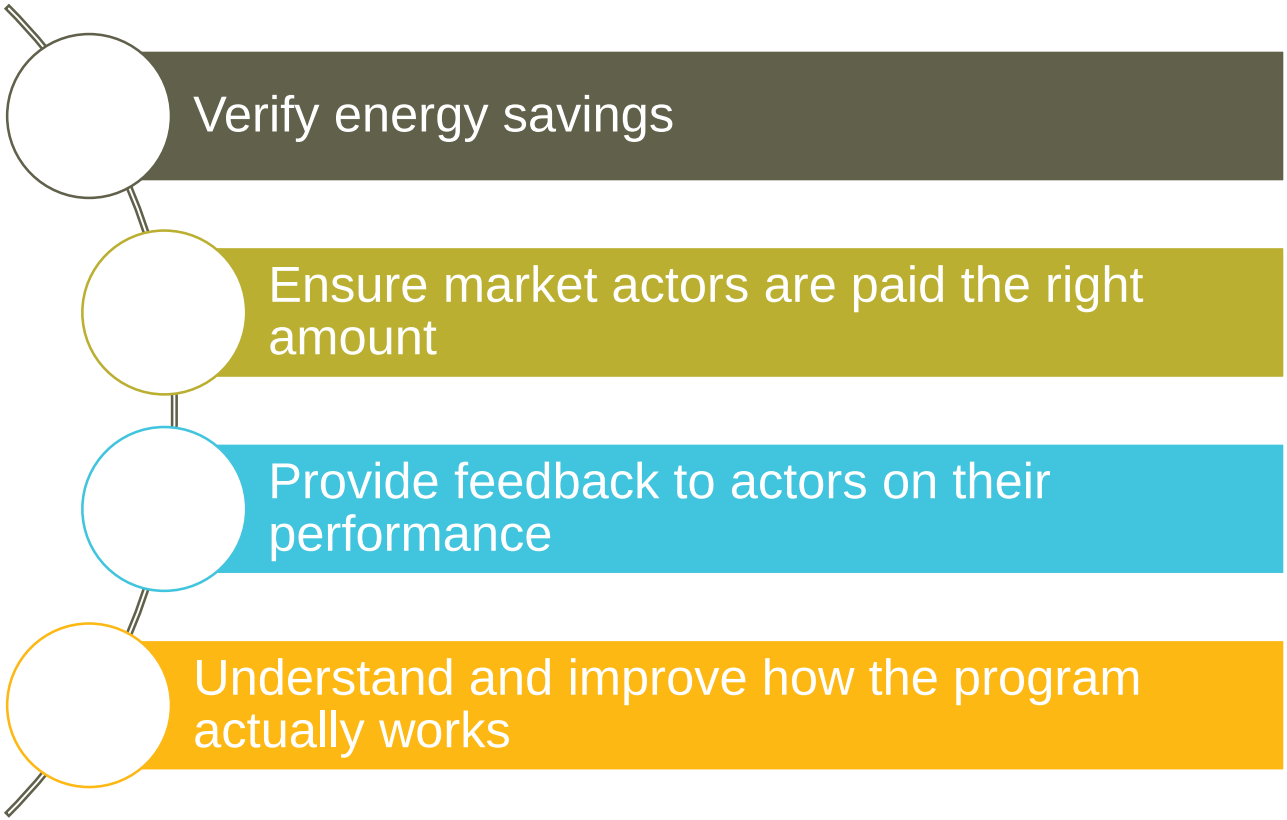
Thank you

Zoe Dawson
Senior Consultant, VEIC
E zdawson@veic.org
T 802-658-6060 x7699

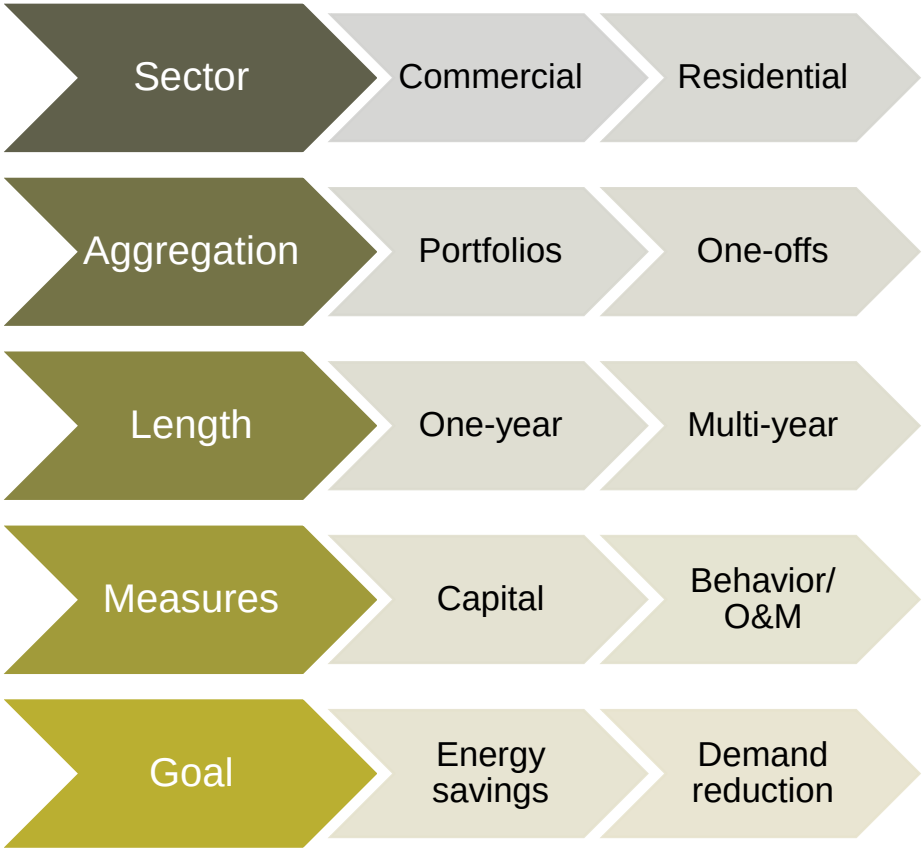
Evaluation of P4P Programs

Energy Trust of Oregon

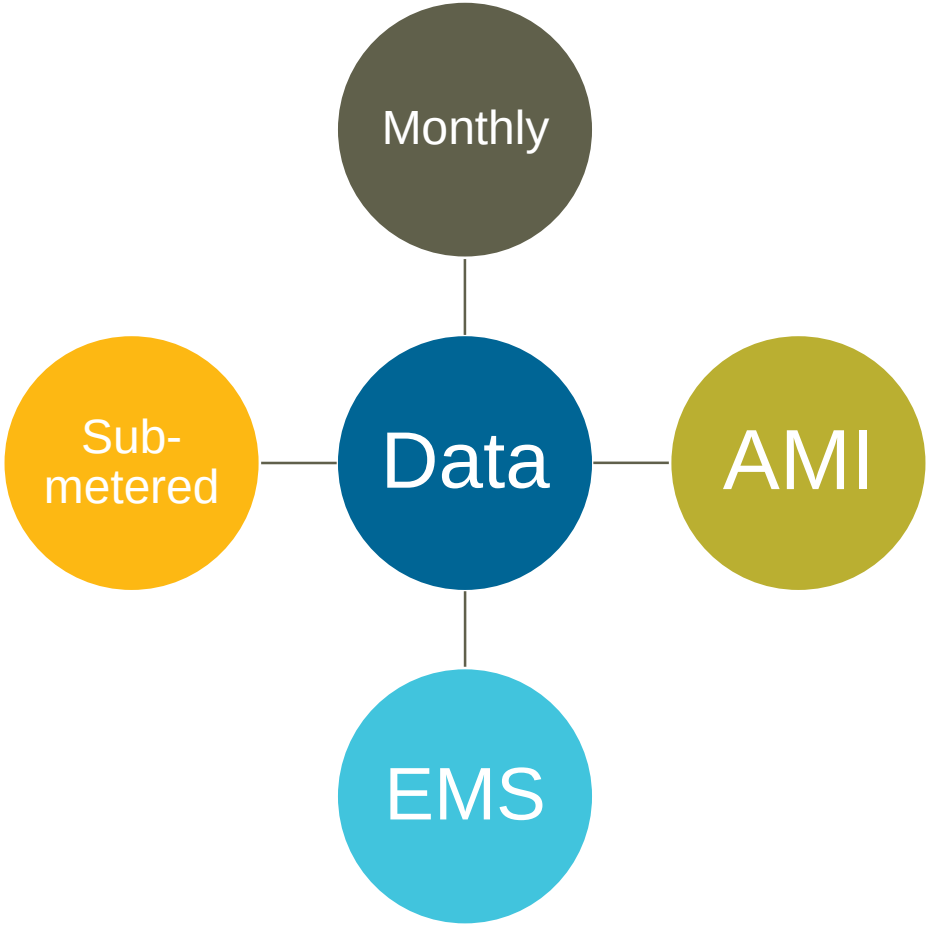
Goals of P4P Evaluation



Evaluation Requirements Will Depend On…



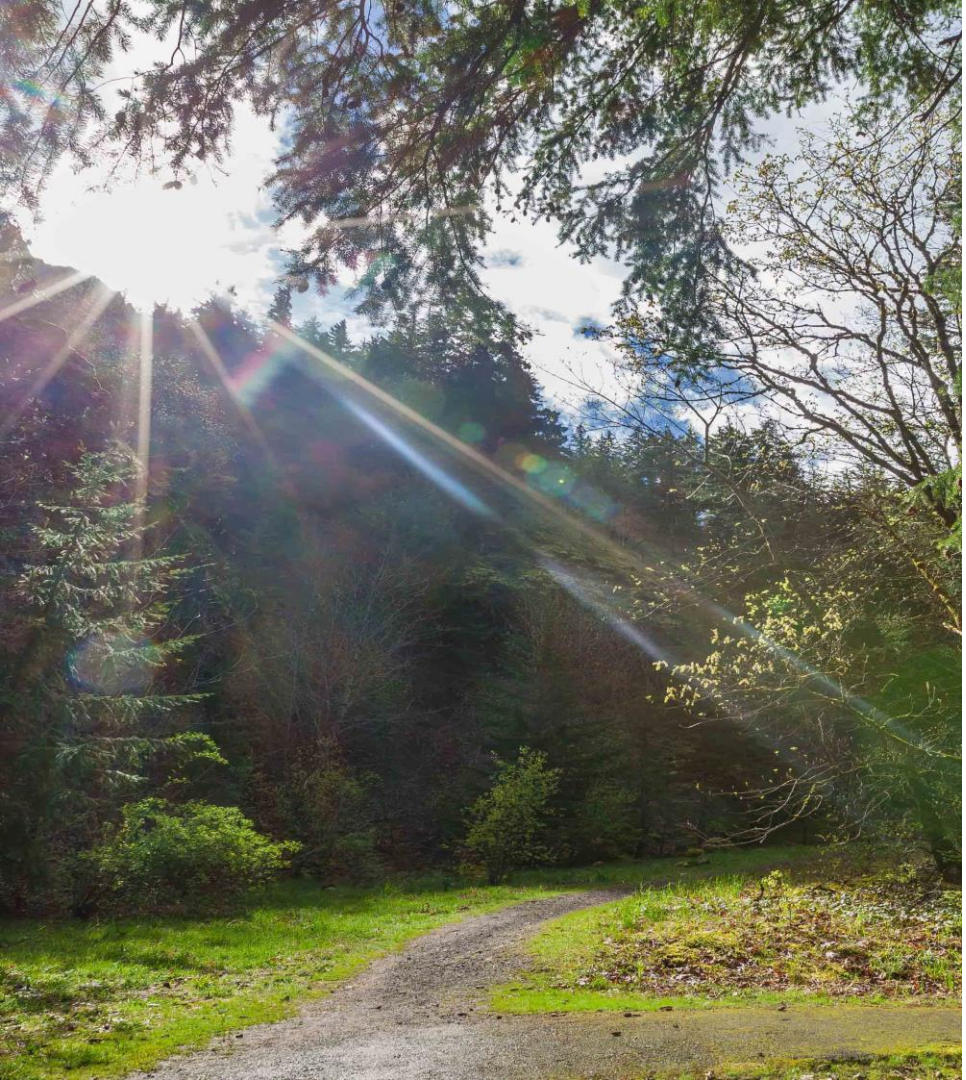
Metered Data



Qualitative Data

Regardless of Program Design

- Know what your evaluation needs to accomplish
- Get your evaluation methods set in advance
- Make sure your methods are understood
- Look at process, not just impact



Sarah Castor

Evaluation Sr. Project Manager

sarah.castor@energytrust.org

Energy Trust of Oregon

Upcoming NEEP Events

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

Poll Question 2

Thank you!