



This Is Your Program, This Is Your Program on Data

Wednesday

9:30 am

Panelists

- Tim Guiterman, EnergySavvy
- Jeff Perkins, ERS
- Michael Li, U.S. Department of Energy

Tim Guiterman

EnergySavvy

CONTINUOUS, EMBEDDED AND AUTOMATED

Leveraging data for your programs...with a spotlight on
Advanced M&V

Tim Guiterman, EnergySavvy
May 17, 2017

A Shift in the Market

Shaping the right experience

&

The customer conundrum in the utilities industry

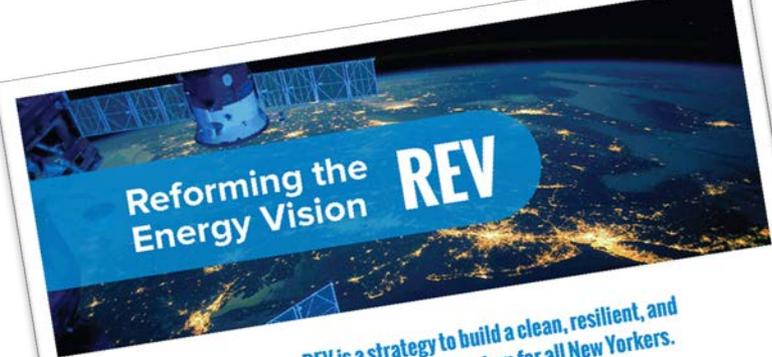
Home Events Library Jobs Viewpoints



Utility DIVE

FEATURE

No time to think: How utilities are handling the deluge of grid data



Reforming the Energy Vision REV

REV GOALS

- Making energy more affordable for all New Yorkers
- Building a more resilient energy system
- Empowering New Yorkers to make more informed energy choices
- Creating new jobs and business opportunities
- Improving our existing initiatives and infrastructure
- Supporting cleaner transportation

REV is a strategy to build a clean, resilient, and affordable energy system for all New Yorkers.

REV is transforming New York State's energy policy and initiatives to make sure energy efficiency and clean, locally produced power are at the core of the State's energy system.

REV is changing the way government and utilities work to make clean energy financially beneficial to everyone. And most importantly, REV is putting customers first by designing new initiatives to impact real people and provide individuals and communities with the opportunity to take an active role in achieving the following State energy goals by 2030.

40% Reduction in GHG emissions from 1990 levels

Reducing greenhouse gas (GHG) emissions from the energy sector—power generation, industry, buildings, and transportation—is critical to protecting the health and welfare of New Yorkers and reaching the longer term goal of decreasing total carbon emissions 80% by 2050.

gtm:

More Utilities Are Offering Services That Allow Customers to Self-Consume Their Solar Power



Leading utilities are looking at how to make money from self-consumption service offerings, not just the sale of more electrons.

by Andy Stone
August 03, 2016

Changing Expectations



Improve customer
experience and
increase relevancy



Deliver new revenue
streams



Manage growing costs
of customer
operations

What We Do

CUSTOMER EXPERIENCE TRANSFORMATION



CUSTOMER
INSIGHTS



CUSTOMER
ENGAGEMENT



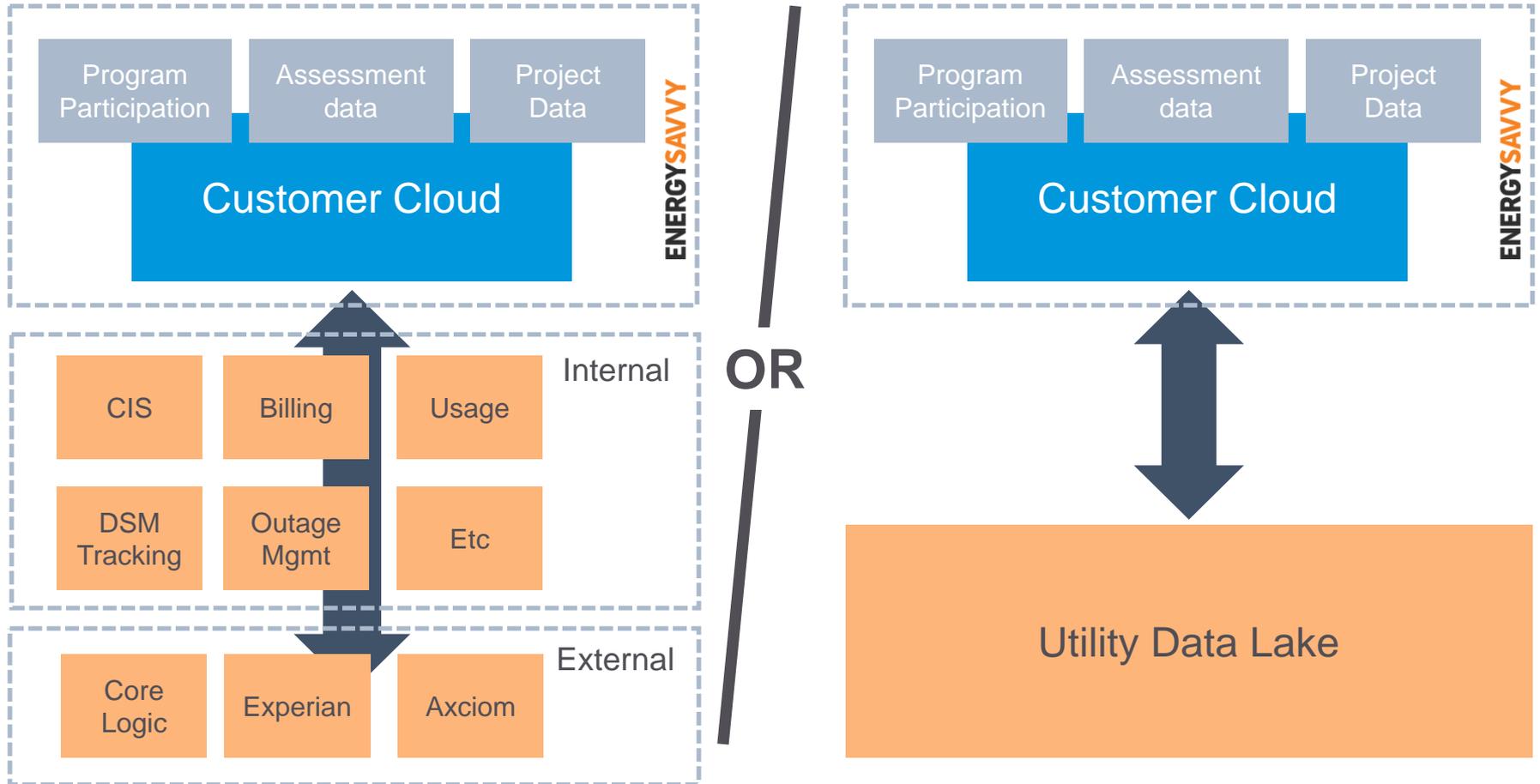
CUSTOMER
OPERATIONS



CUSTOMER CLOUD

It starts by getting data into one place...

This can be complicated...



...And turning it into actionable customer intelligence

Holistic view of the customer

Integrates 3rd-party data (property, psychographics, etc.)

Integrate data from disparate systems

John Simpson

OVERVIEW PROGRAMS & SERVICES **Past program participation** DATA SOURCES

Customer Information System [HIDE DETAILS](#)
Synced on 1/2

Account No.	Sex	Address	Phone	Email
873142906	Male	175 Main St Tacoma, WA 97210	206-539-9214	simpson@example.com

Third Party Demographic Data [HIDE DETAILS](#)
Synced on 1/2
Data available from 12/2014

Date of birth	Sex	Marital Status	Own/Rent	Ethnicity
3/14/1980	Male	Single	Own	Caucasian

[DOWNLOAD CSV](#)

Weather Data [HIDE DETAILS](#)
Synced on 1/2

Station ID: 448213 | Location: Seattle, WA 98104

Month	Temperature (°F)
Jun	72
Jul	85
Aug	65
Sep	68
Oct	62
Nov	52
Dec	48

[DOWNLOAD CSV](#)

Billing System [HIDE DETAILS](#)
Synced on 12/24

	Jul 2015	Aug 2015	Sep 2015	Oct 2015	Nov 2015	Dec 2015
kWh	525	570	620	510	489	602
\$	110.34	115.45	140.46	103.56	103.46	131.51
On-time/late payment	Late	On-time	Late	On-time	On-time	On-time

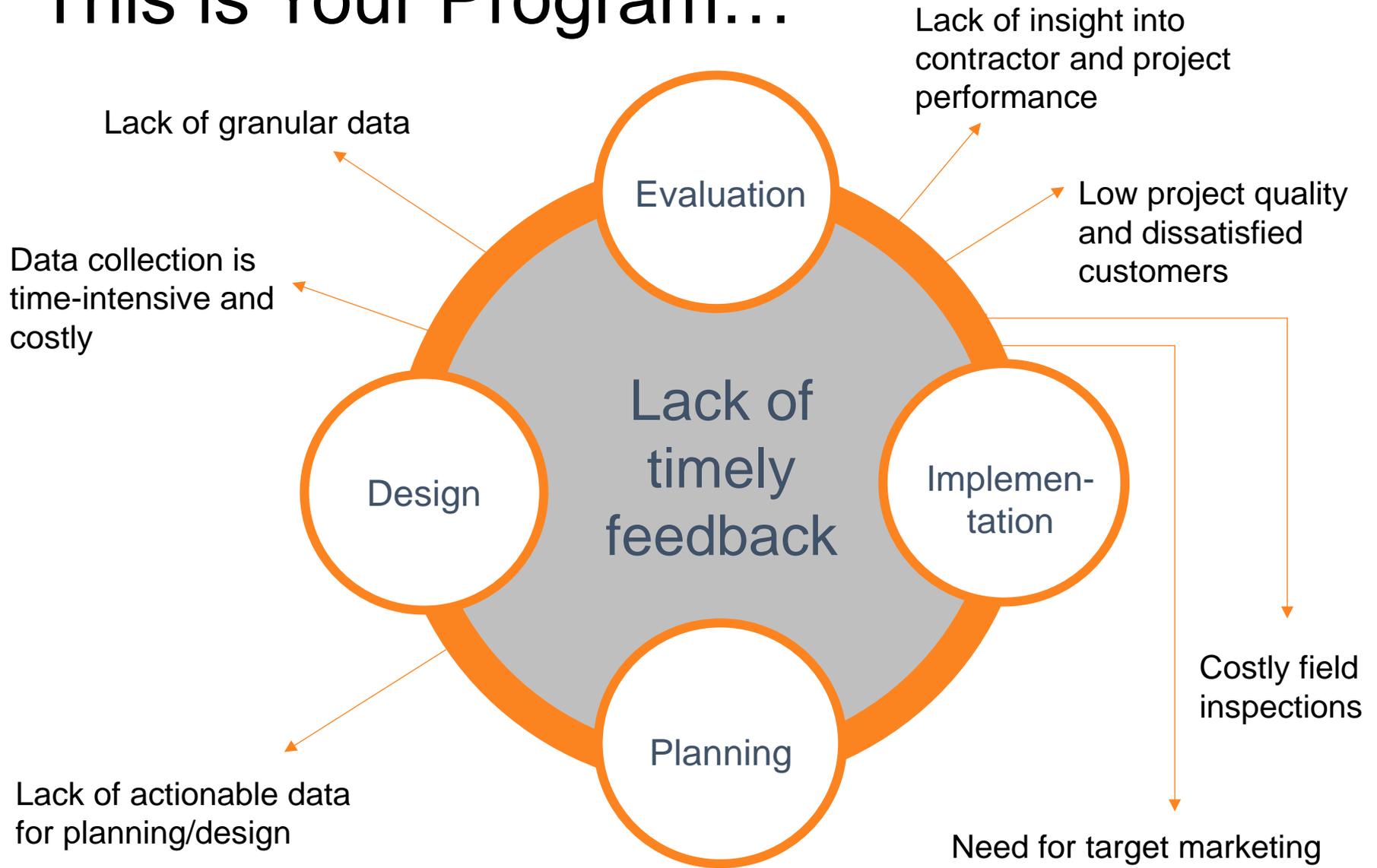
[VIEW FULL BILLING HISTORY](#)

JD

Advanced M&V

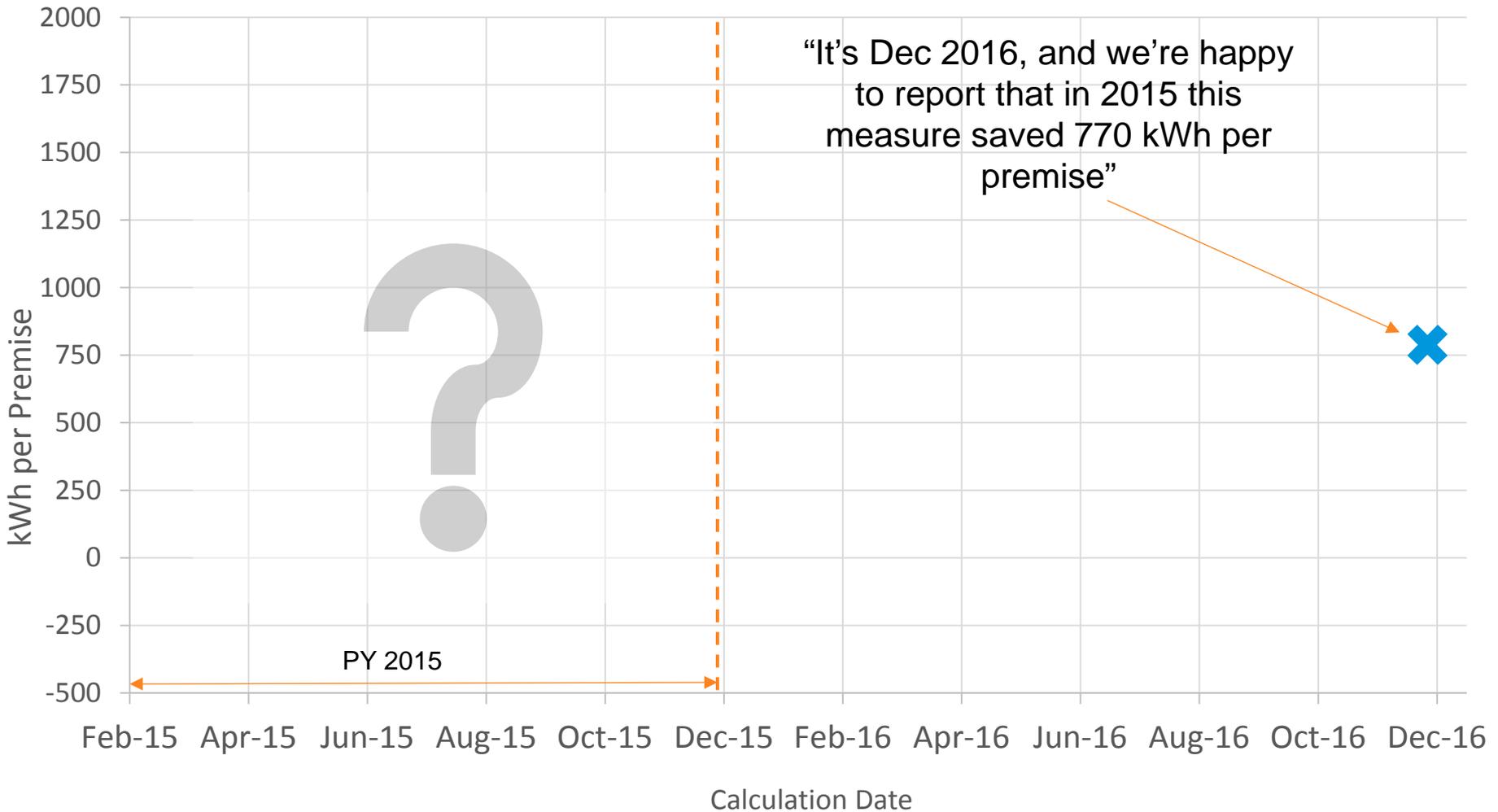
(aka M&V 2.0 or Program Optimization...)

This is Your Program...



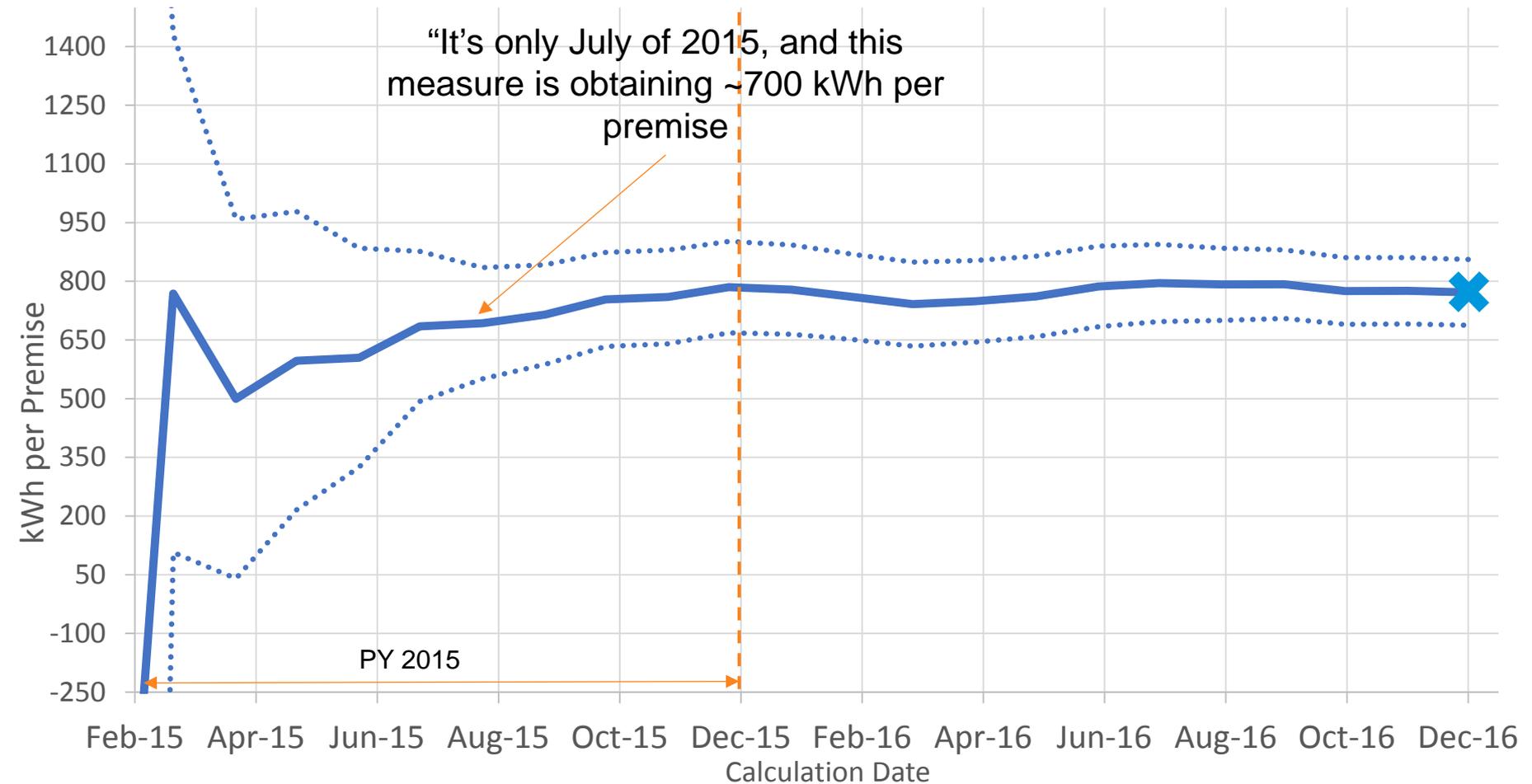
This is Your Program...

“Your program has been over for a year, now we can tell you how it did...”



This is Your Program on Data...

Reliable indicators of savings performance during implementation*



*Example is for a cooling measure-dominated program. Programs with heating and cooling measures have shown earlier results

This is Your Program...

Photo from investigation by Boston based TV news team on State EE Program



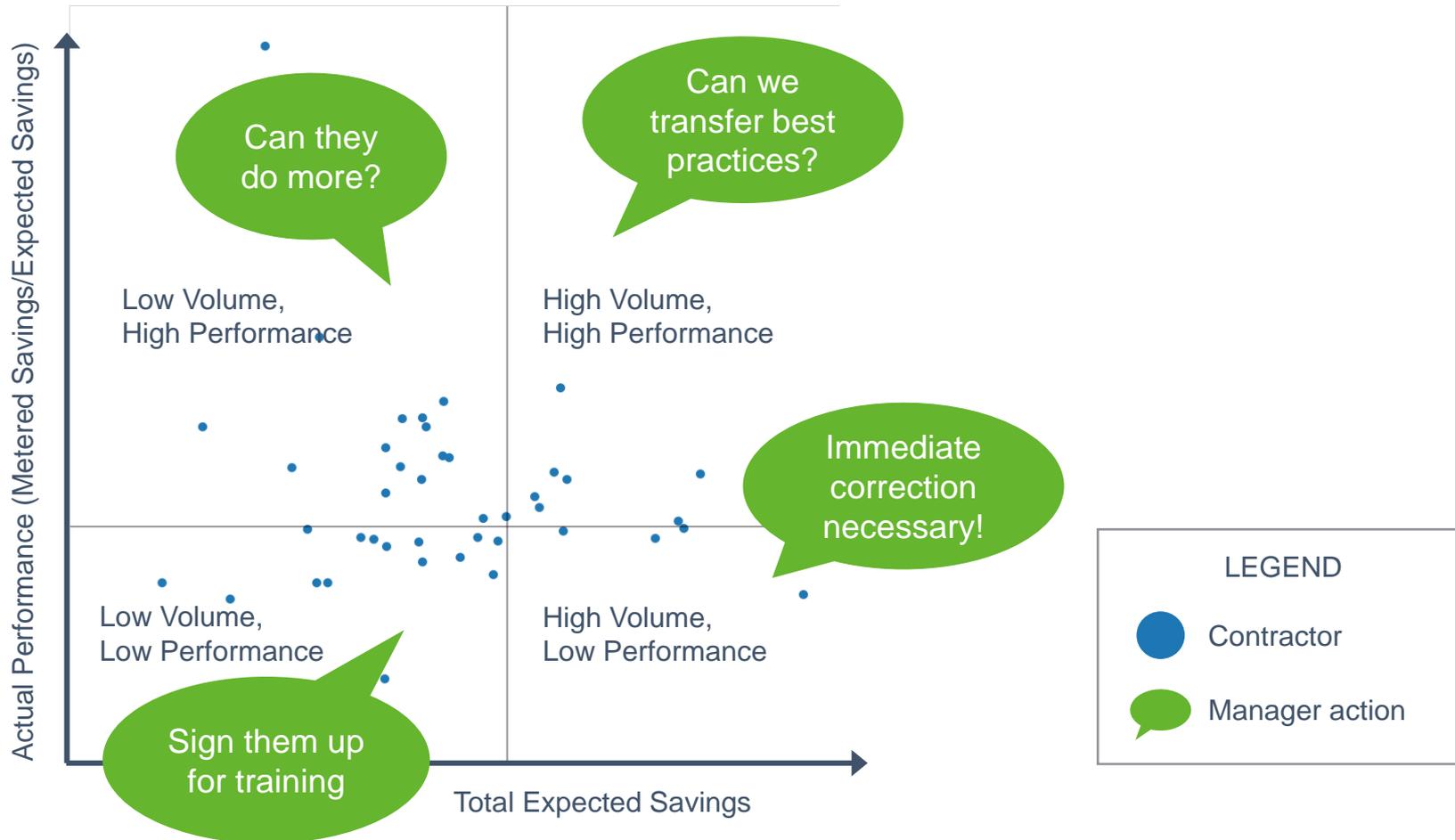
Insulation spilling from walls after residential retrofit.



Mold found in attic after insulation installation

This is Your Program on Data...

Comparing savings at the meter to expected savings reveals good, bad and ugly.



M&V 2.0 Defined...



A defining criterion for automated M&V software is that it continuously analyzes data as it becomes available.

New York Dept. of Public Service, EM&V Guidance, Nov 2016

Floating Names

M&V 2.0

Advanced
M&V
(NY REV / RMI)

EM&V 2.0

Automated
M&V
(NEEP)

ICT-Enabled
EM&V
(ACEEE)

RMI: The Status and Promise of Advanced M&V

Collaborative Study involved DOE, Utilities, Evaluators, and Analytics Firms



Automated analytics that can provide **ongoing, near-real time savings estimates**



Increased data granularity in terms of frequency, volume, or end-use detail



M&V 2.0 benefits evaluators, program administrators, regulators, grid operators and others.

“Advanced M&V can increase the value of evaluation, reduce costs through automation, enhance program targeting, allow for early adjustments to program designs and budgets, and increase accuracy of savings estimates to support EE as a resource.”

Case Studies

Contractor Scorecard



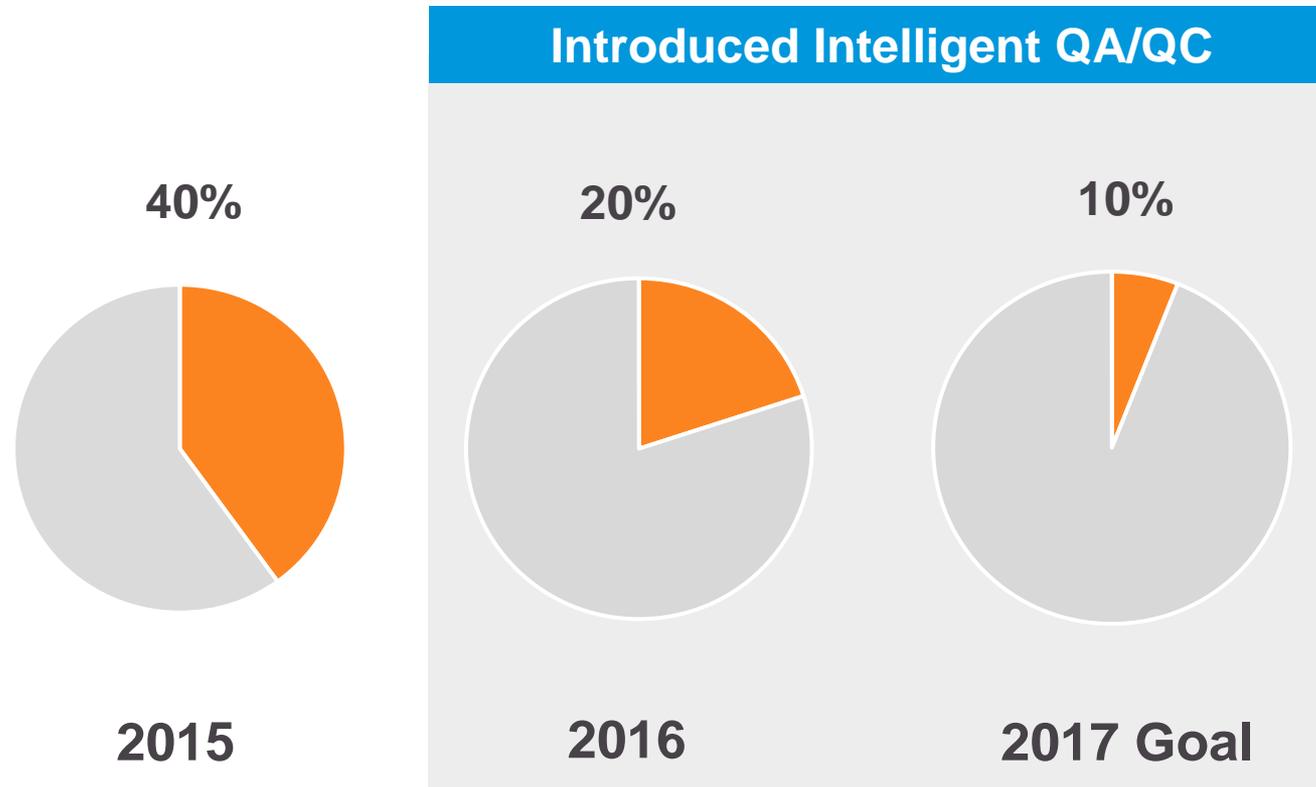
Challenge

Contractors are unaware of their project performance

Solution

Issue scorecards to contractors to communicate performance of projects

Attic Inspections



Challenge

Reduce costs and intrusiveness of QA/QC process

Solution

Use intelligent monitoring to reduce and target # of QA/QC inspections

APS shifted approximately 25% of the overall inspection budget to directly improve the program.

**All percentages are the percent of total annual projects (assumes 2,000 projects/year)*

Validating M&V 2.0

M&V 2.0 is accurate.



VALIDATION PLAN:

Outlined specific criteria by which M&V 2.0 would be judged

GOAL:

Determine if M&V 2.0 produced replicable, accurate results

Residential HVAC Program—energy savings (kWh)

✓ 2015 program-wide realization rate within 10 percentage points?

Residential HVAC Program—coincident peak demand (kW)

✓ 2015 program-wide realization rate within 10 percentage points?

Insight Behavioral Program

✓ 2015 average per-premise kWh savings have overlapping 90% confidence intervals?

Source: DTE & EnergySavvy, [Emerging Technology Summit 2017](http://bit.ly/2qUUdS1). <http://bit.ly/2qUUdS1>

Validating M&V 2.0

M&V 2.0 can produce reliable savings estimates mid-way through a program year.

One of the promises of M&V 2.0 is that it allows for program impacts to be understood during the program year due to:



Measure-as-you-Go nature of the analysis



High volume of projects that are directly analyzed



Large one-to-many comparison group methodology

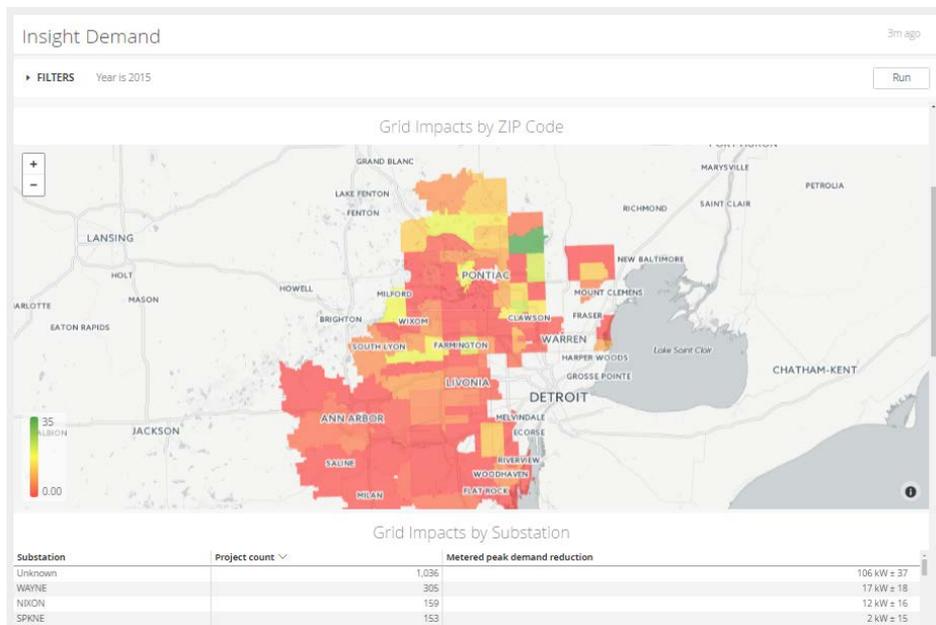


The pilot indicates that this is indeed possible.

Source: DTE & EnergySavvy, [Emerging Technology Summit](http://bit.ly/2qUUdS1) 2017. <http://bit.ly/2qUUdS1>

Validating M&V 2.0

M&V 2.0 can measure low-level energy savings (1-2% of annual energy use) & coincident peak demand reduction.



- M&V 2.0 is a good fit for behavioral programs
- Methodology can include a control group
- Tangible EE and PDR difference between lower- and higher-engagement customers

Source: DTE & EnergySavvy, [Emerging Technology Summit 2017. http://bit.ly/2qUUdS1](http://bit.ly/2qUUdS1)

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ENERGYSAVVY

Jeff Perkins

ERS

REAL TIME M&V

MEASURE, KNOW, UNDERSTAND



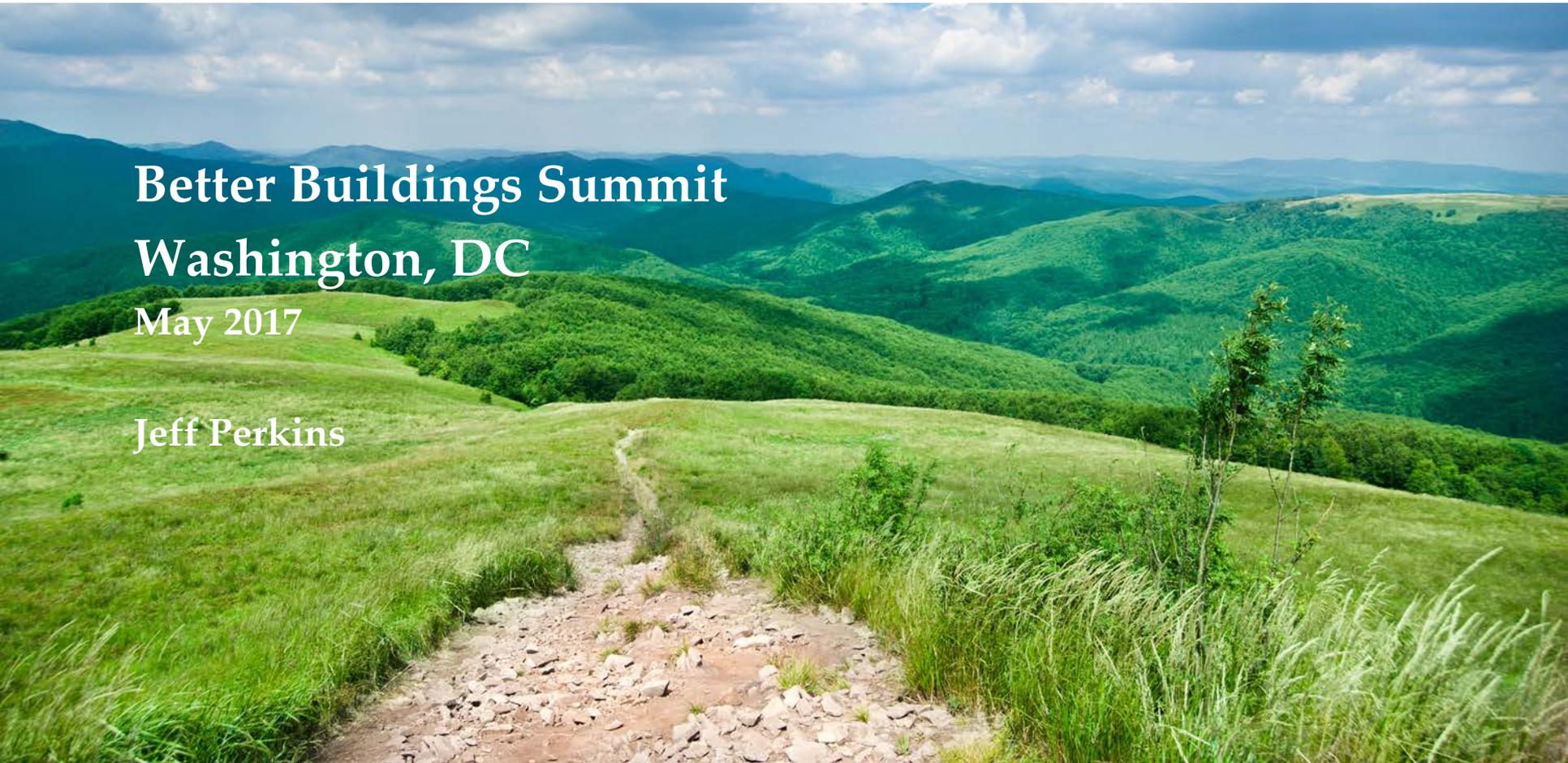
energy & resource
solutions

Better Buildings Summit

Washington, DC

May 2017

Jeff Perkins



SEEING IS BELIEVING

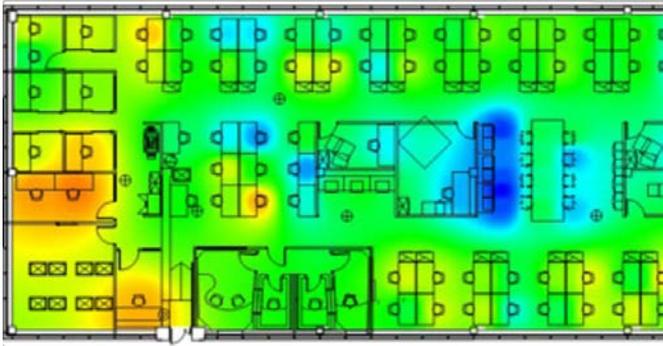


SEEING IS UNDERSTANDING

NYC Energy Data Mapping



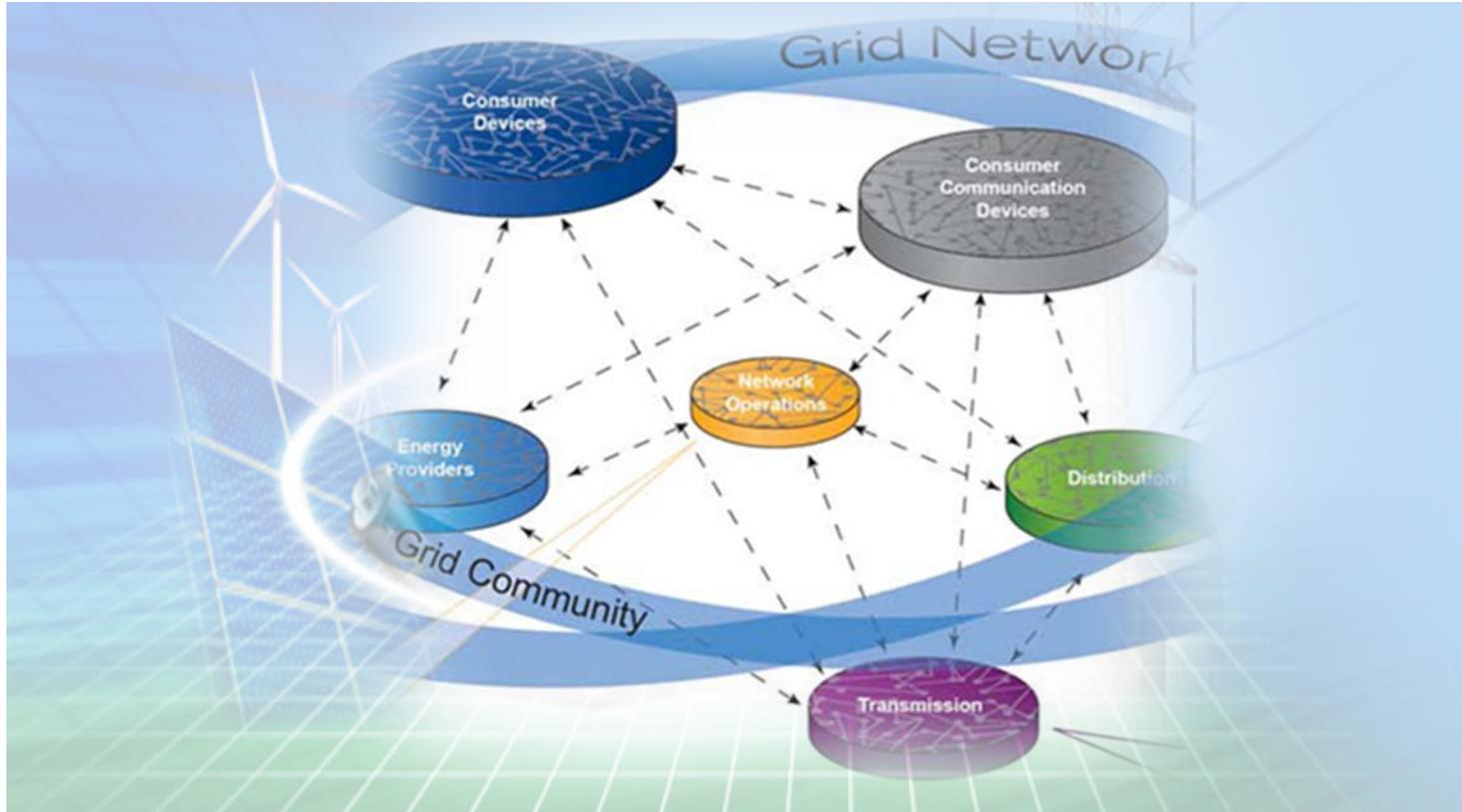
Heat Maps



THE EVOLVING GRID...



DATA

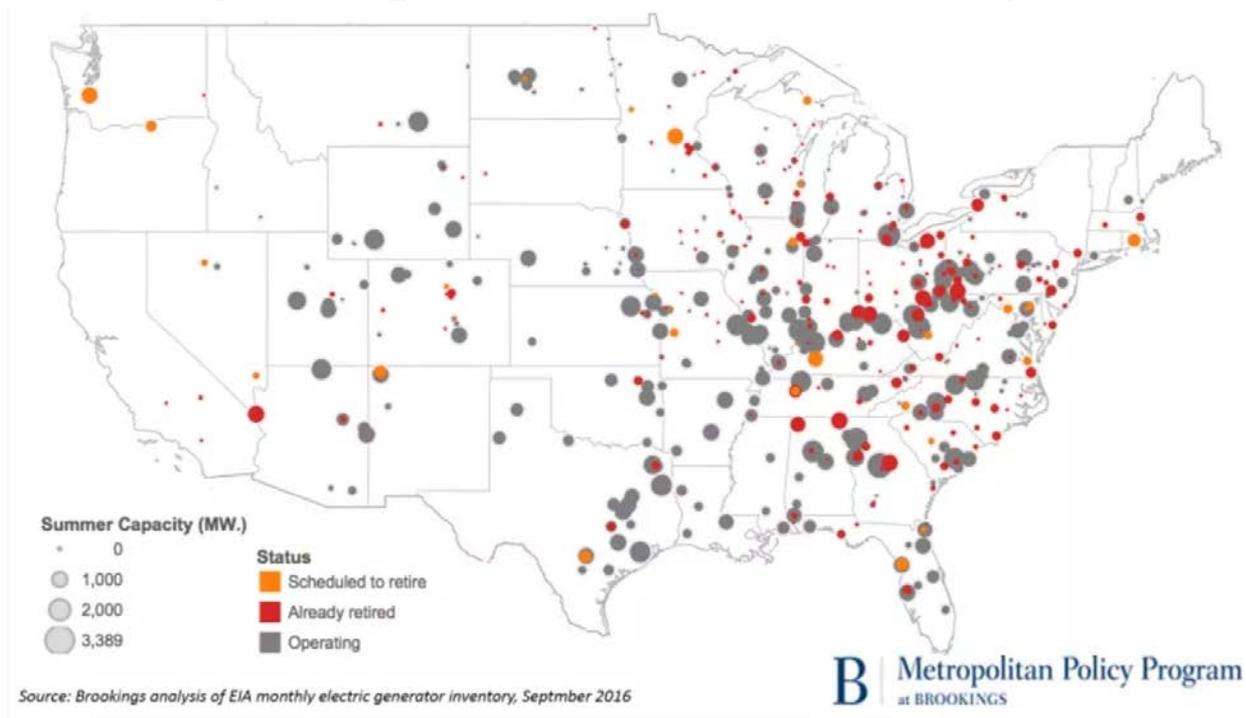


RETIRING POWER PLANTS

U.S. nuclear power plants already closed or closing



Retiring coal plants: Yellow/Closing, Red/Closed



INDIAN POINT CLOSING: WHAT SOLUTION?

NEW YORK POST

New York Has No Idea How to Keep the Lights On When Indian Point Closes

03/04/2017

THE HUFFINGTON POST

Replacing the Indian Point Nuclear Power Plant with Energy Efficiency

03/06/2017

zondits.com

What Happens When We Shut Down Indian Point?

03/13/2017



IS IT THERE IF YOU CAN'T SEE IT?

- ❑ Can Energy Efficiency Compare with:
 - Distributed Generation?
 - Renewable Energy?
 - T&D Upgrades?



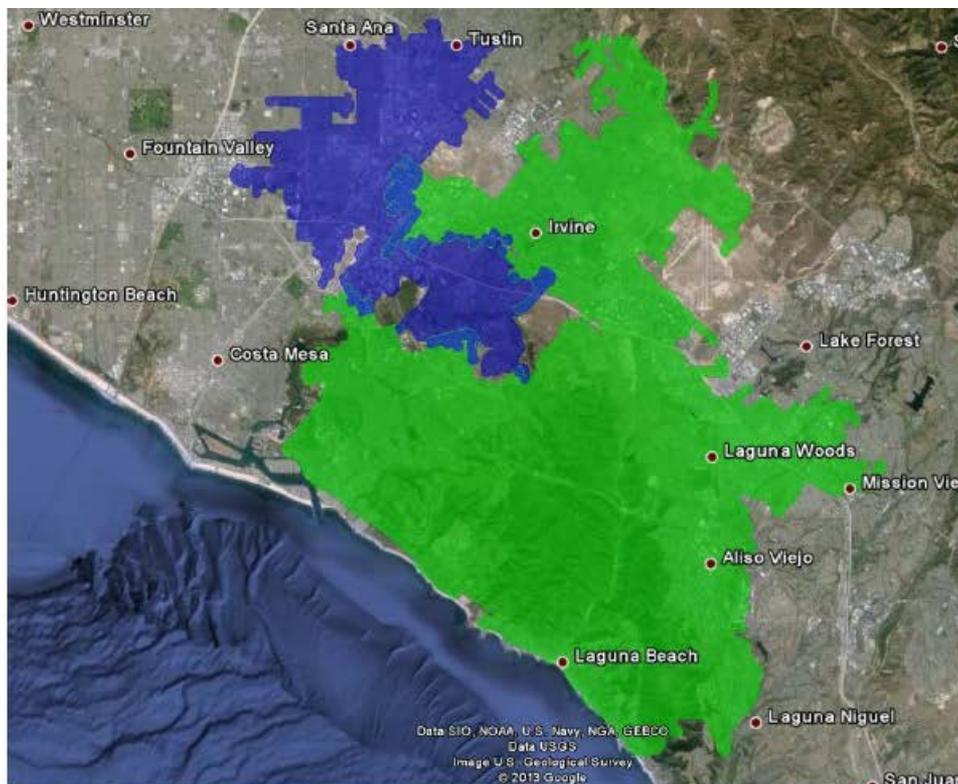
Typically, system planners have not included efficiency impacts at a substation level.

SCE: PREFERRED RESOURCES

The Pilot is exploring the intensive use of DSM to meet local area reliability needs caused by the SONGS closure.

Objectives Include:

- ❑ Demonstrate DSM can be used to meet local capacity & reliability needs
- ❑ Measure grid impact of DSM
- ❑ Implement a Preferred Resources portfolio to address local peak needs
- ❑ Minimize/eliminate the need for gas-fired generation at these locations
- ❑ Identify lessons learned to apply to other grid areas



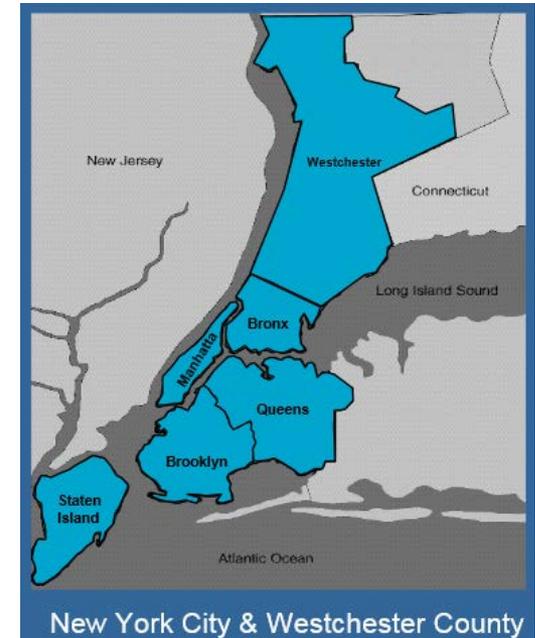
The Pilot will provide “real time, real world” experience to reduce the performance uncertainty associated with Preferred Resources

REAL-TIME EXAMPLES

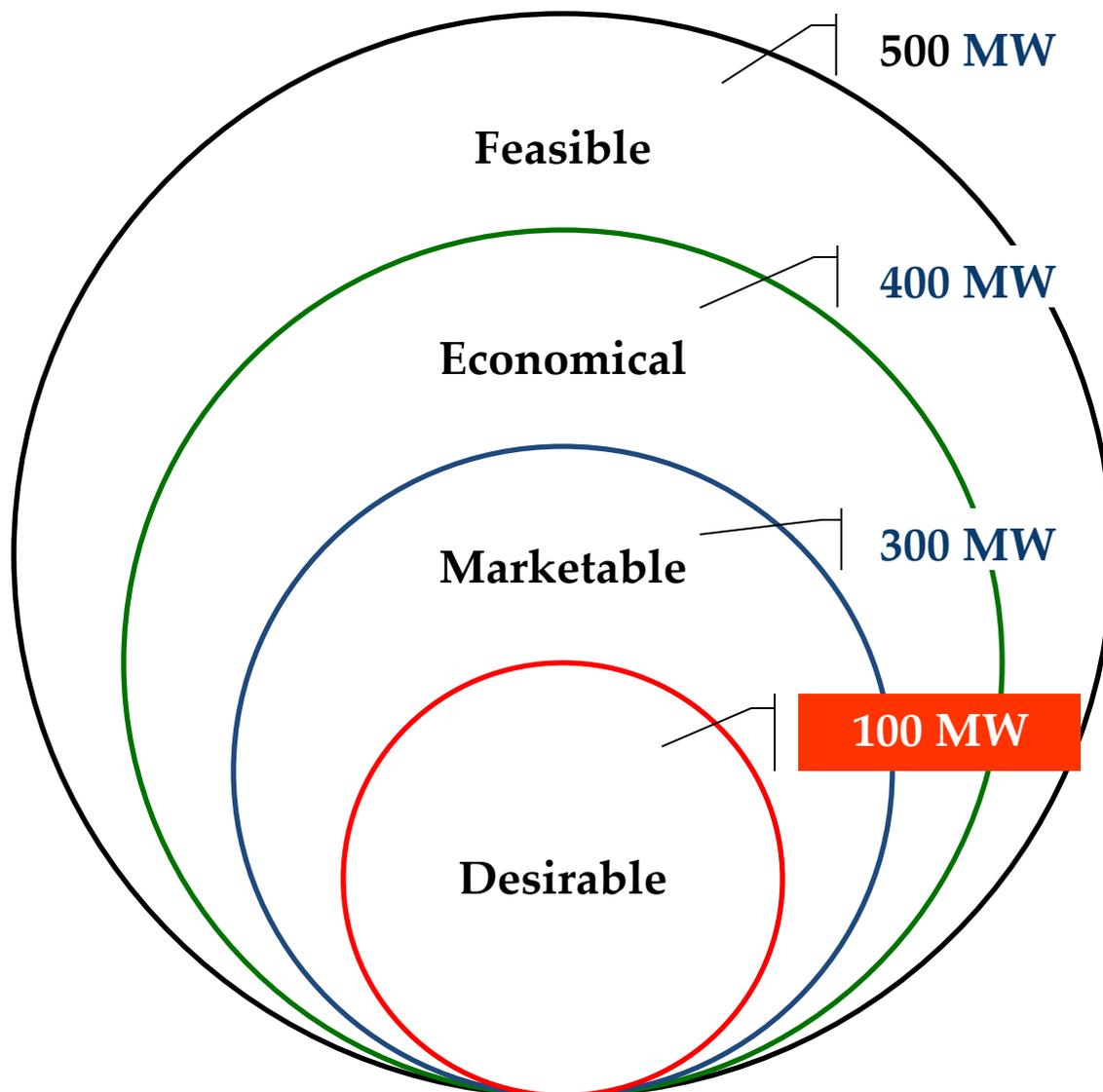
Closing Indian Point Nuclear Plant

- 2 GW to replace:
 - 1 GW Hydro-Quebec
 - Renewables
 - 25 MW of CHP
 - Energy Efficiency
 - 100 MW of Efficiency Upgrades
 - Targeted 2-6 pm, Jun-Sep
 - Demand Management Program (DMP)

- And – BQDM “non-wires” **distribution** solution
 - Install \$200 million customer side resources to defer building a \$1 billion substation



IDENTIFYING MOST DESIRABLE DSM



INCREASED VALUE OF EFFICIENCY

- ❑ Temporal & Locational Premium
- ❑ Incentives at the time of the program (2016)

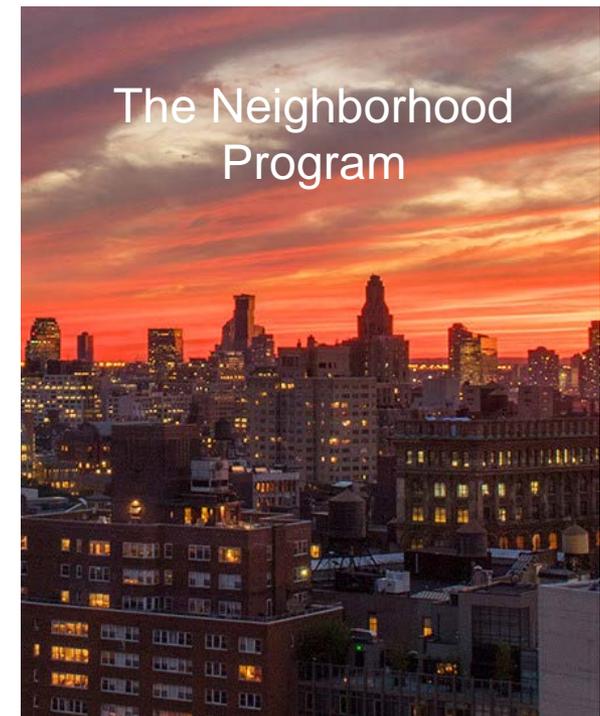
DEMAND MANAGEMENT PROGRAM

In addition to the current program offerings, increased incentive rates will be offered to eligible Con Edison electric customers for energy improvements that provide summer on-peak demand reduction.

Project Type	Current Offering	New Offering
Thermal Storage	\$600/kW	\$2,600/kW
Battery Storage	\$600/kW	\$2,100/kW
DR Enablement	\$200/kW	\$800/kW
Chiller/HVAC/BMS/Controls	\$0.16/kWh	\$0.16/kWh + \$1,250/kW
Lighting	\$0.16/kWh	\$0.16/kWh + \$800/kW

REAL-TIME M&V

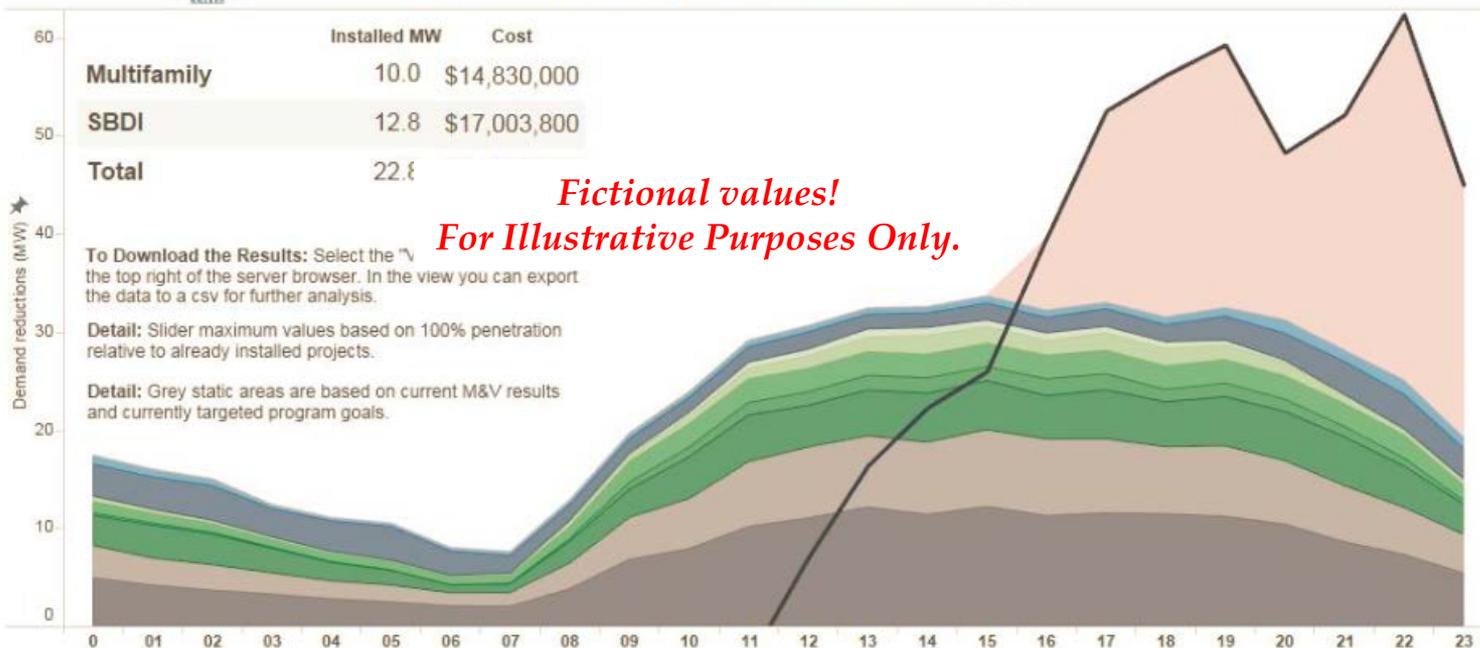
- ❑ Efficiency can target specific objectives
 - savings 2-6pm June – September
- ❑ No room for error: reliability, resiliency...
- ❑ Specific knowledge needed:
 - Which measures match needs
 - In which sectors
 - Which incentives to adjust
 - Measures to add/delete
 - How to target marketing



REAL TIME DASHBOARD



Planning & Forecasting



SBDI Office Installed MW

SBDI Retail Installed MW

SBDI Other MW

MFCA Installed MW

SBDI Grocery Installed MW

SBDI Industrial Installed MW

SBDI Restaurant Installed MW

MFIU Installed MW

Progress by Hour

	12	13	14	15	16	17	18	19	20	21	22	23
MW Needed	-23.7	-16.1	-10.3	-7.7	7.4	19.5	24.7	26.8	17.0	24.0	37.3	25.7
SBDI	10.0	10.9	11.7	11.2	10.8	11.5	10.7	10.8	10.2	9.3	8.0	5.7
MFCA	1.8	1.5	1.5	1.7	1.6	1.8	1.7	2.5	2.7	3.4	3.5	3.1
MFIU	0.7	0.7	0.7	0.8	0.8	0.7	0.8	0.9	1.4	1.2	1.5	1.2
Achieved MW	12.4	13.1	13.9	13.7	13.2	13.9	13.2	14.1	14.4	13.9	13.0	9.9



BUILDING HEALTH

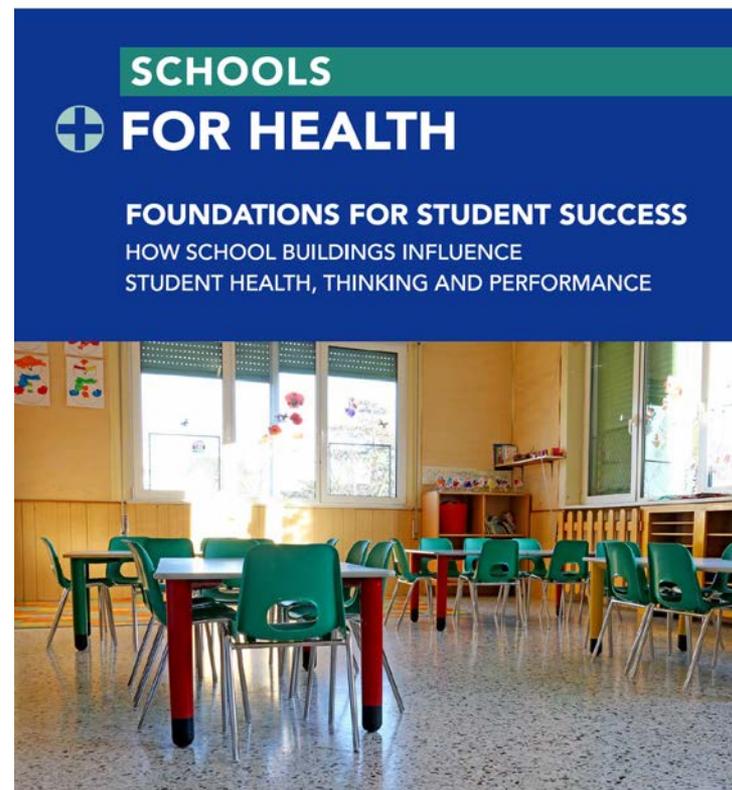
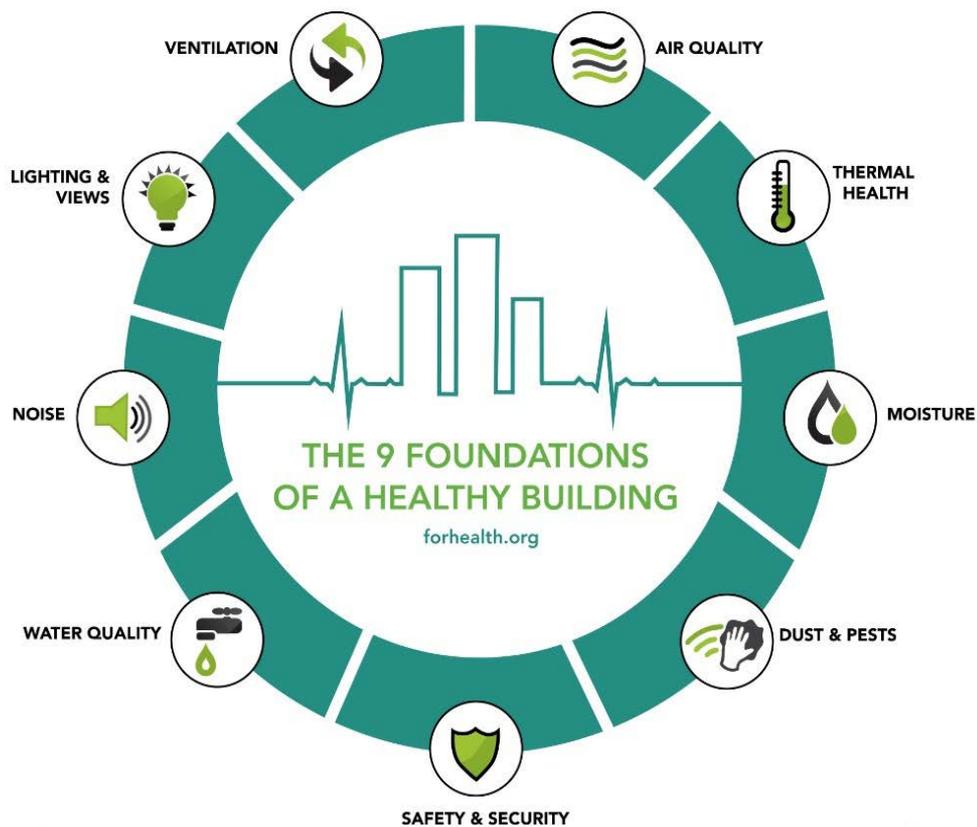
McGraw-Hill (2013) survey of property owners with non-residential buildings:

Significant benefits from healthy buildings

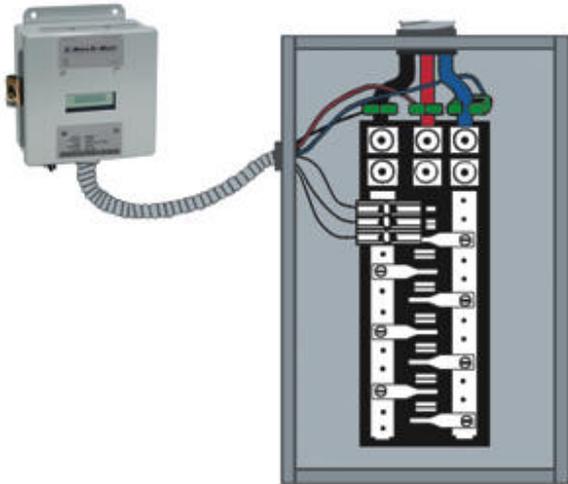
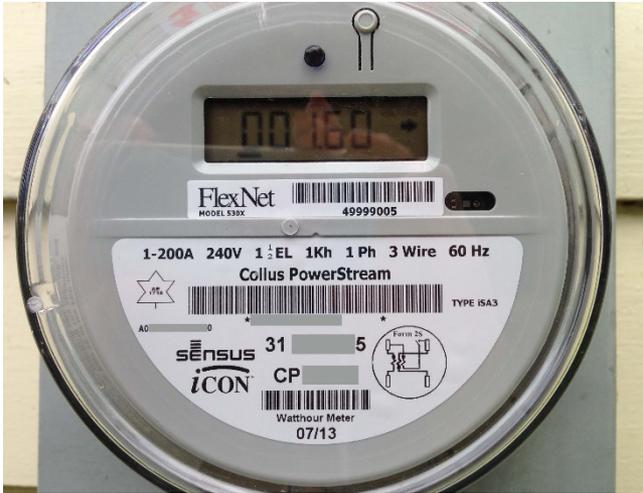
- ❑ 47% — Healthcare cost reduction of 1% to 5%
- ❑ 66% — Improved employee satisfaction
- ❑ 56% — Lower absenteeism
- ❑ 21% — Higher employee productivity

BUILDING HEALTH

Schools and learning outcomes...



SOURCES OF DATA



HAPPENING TODAY

- ❑ Advancements in wireless metering
- ❑ Multi-function data gathering devices



- Energy
- Demand
- Light
- Occupancy
- Temperature
- Noise
- Indoor air quality
- Vibration
- IR
- Etc.

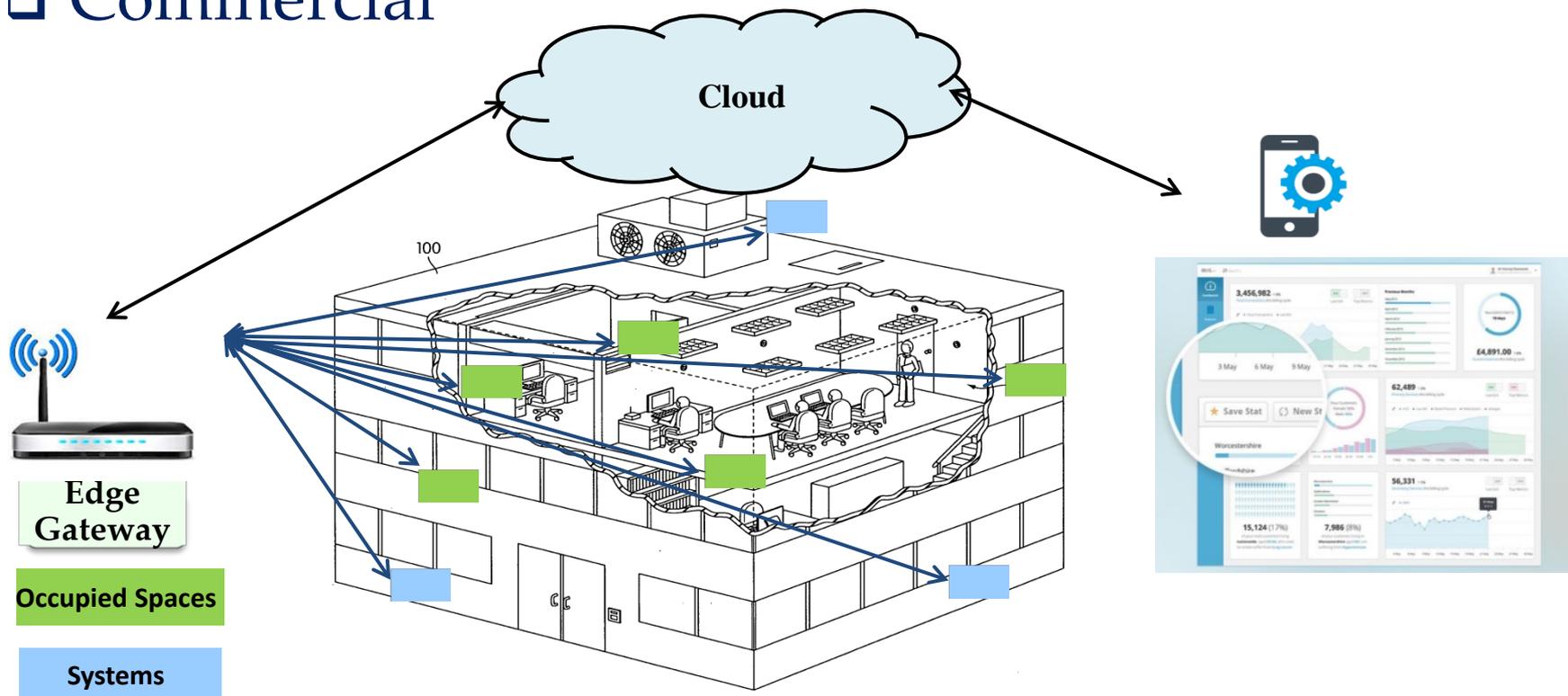


THIRD PARTY DATA SYSTEMS

□ Residential

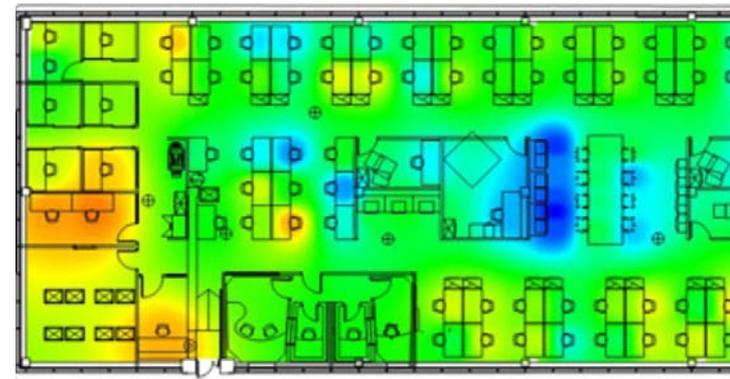


□ Commercial



USES FOR GRANULAR DATA

- ❑ Increase understanding of demand side resources
- ❑ Temporal and locational targeting of DSM
- ❑ Spot changes in use and potential negative shifts
- ❑ Heat mapping of attributes, within buildings, across neighborhoods and territories
- ❑ Better understanding of facility usage
- ❑ Workplace analytics
- ❑ Correlation of conditions to productivity

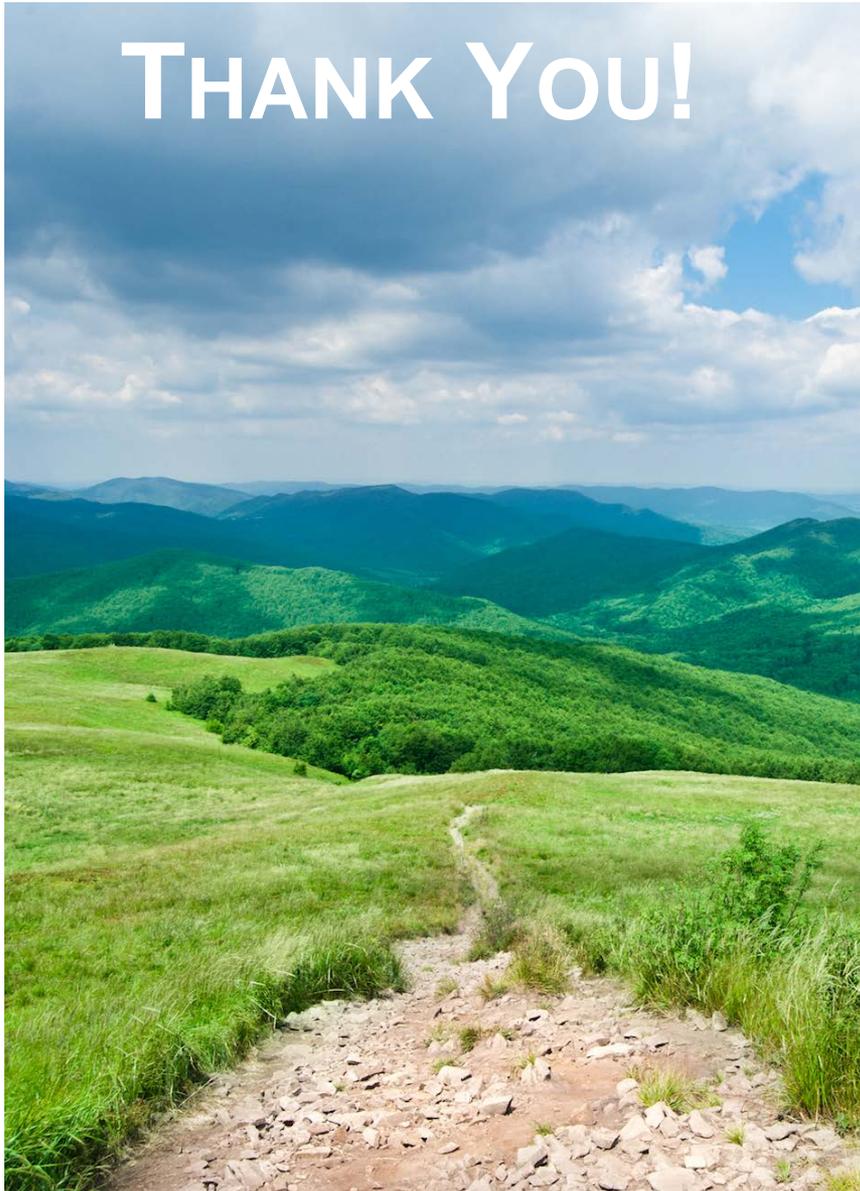


THANK YOU!



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Thank You

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