M&V 2.0: Modern Measurement

Agenda

Topics for discussion

1	M&V 2.0 Overview
2	Activities in Other States
3	Case Studies
4	NH Applications

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What is M&V 2.0?

"

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	EM&V 2.0	Advanced M&V (NY REV)	Automated M&V (NEEP)	ICT-Enabled EM&V (ACEEE)

Research from NEEP and ACEEE

Estimated savings reductions from automated consumption data analysis can provide rapid feedback to programs whether or not this analysis is used as the final evaluated savings. Such rapid feedback is useful whether it is provided as part of program delivery or as part of evaluation.

**neep** REGIONAL EVALUATION, MEASUREMENT & VERIFICATION FORUM
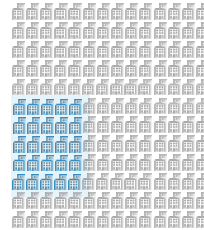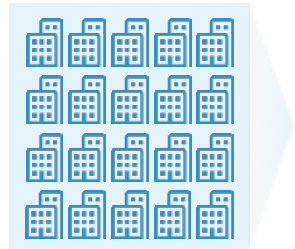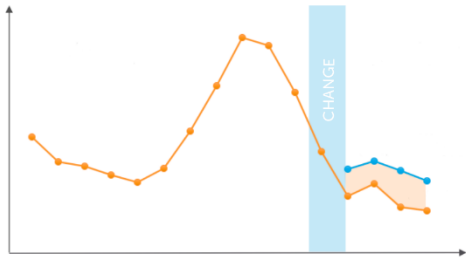
By incorporating [Information and Communication Technologies] ICT into the design and management of their services, program administrators and evaluators will be able to improve the effectiveness of their actions and reduce their operating costs.

ACEEE American Council for an Energy-Efficient Economy
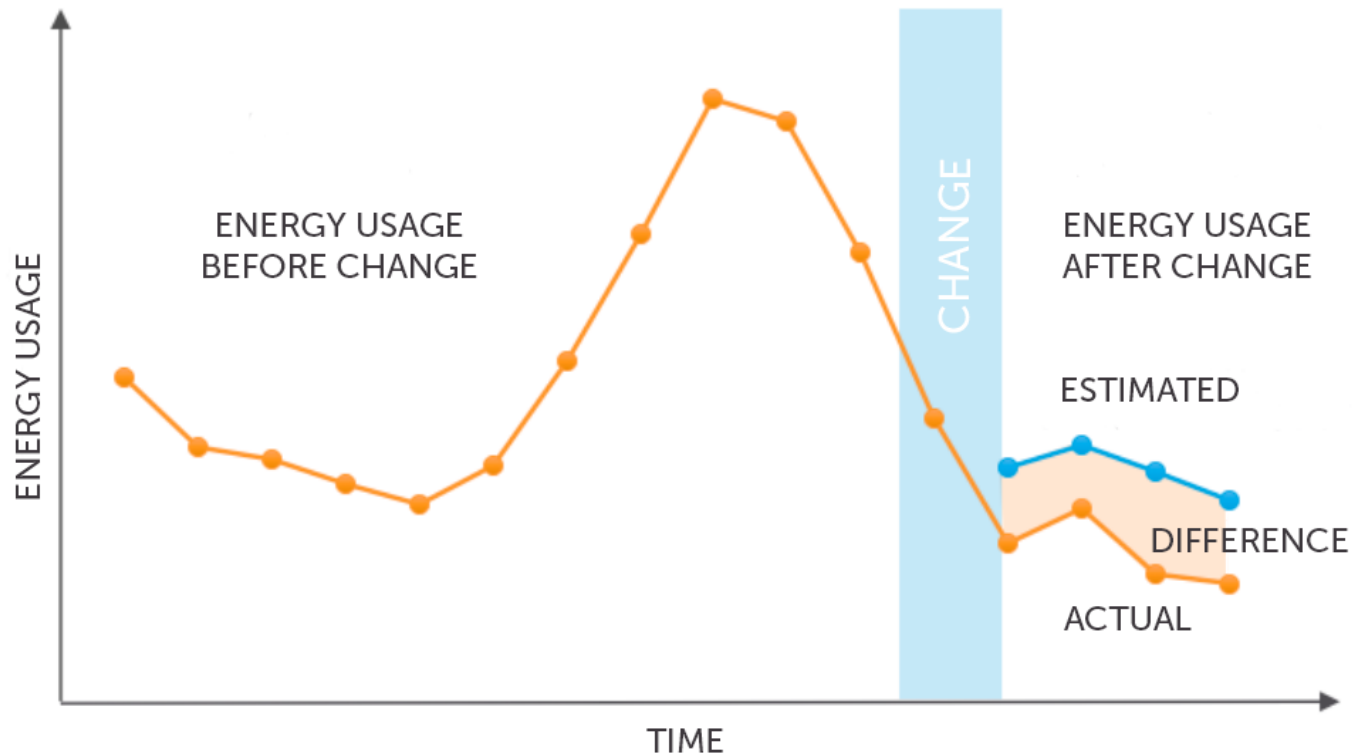
How Does M&V 2.0 Work?

How Does M&V 2.0 Work?
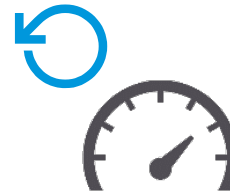
Build weather-normalized models for each customer

Compare changes in usage for treated customers vs. overall population

Repeat analysis for all customers with each new addition of data

Generate dashboard of findings, analytics and actionable insights

Estimating Savings Continuously
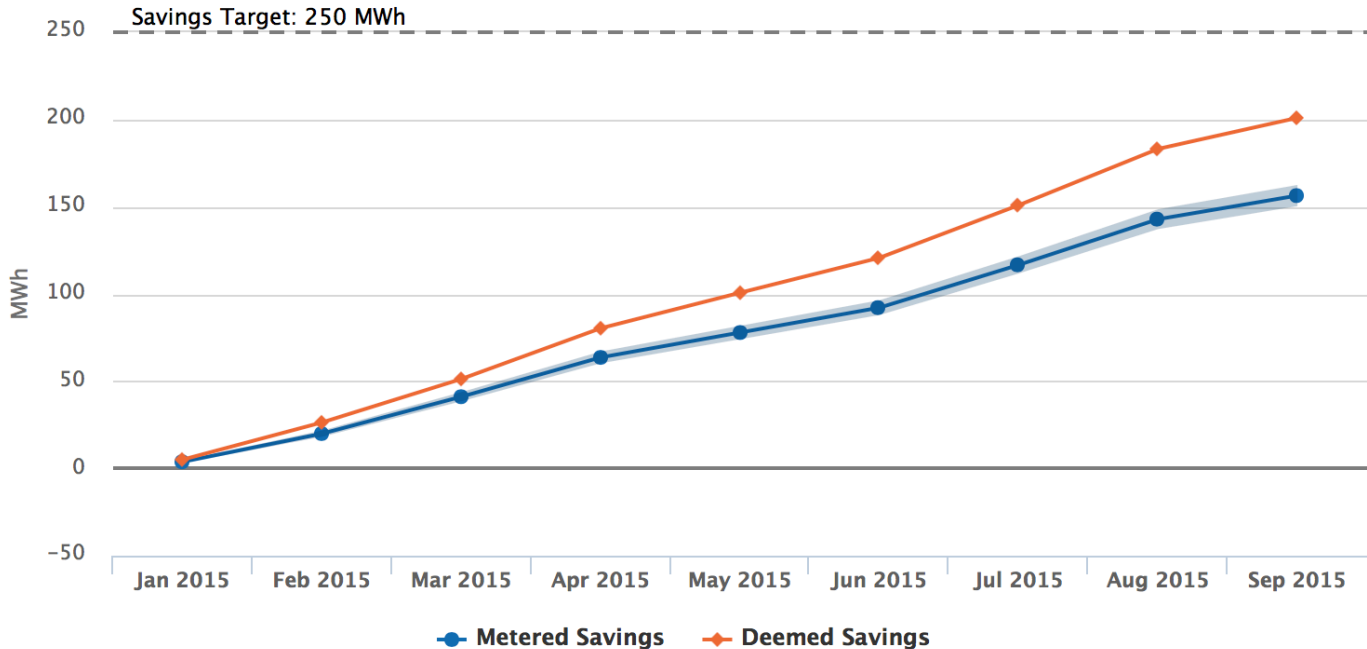
Exploring Factors Impacting Savings
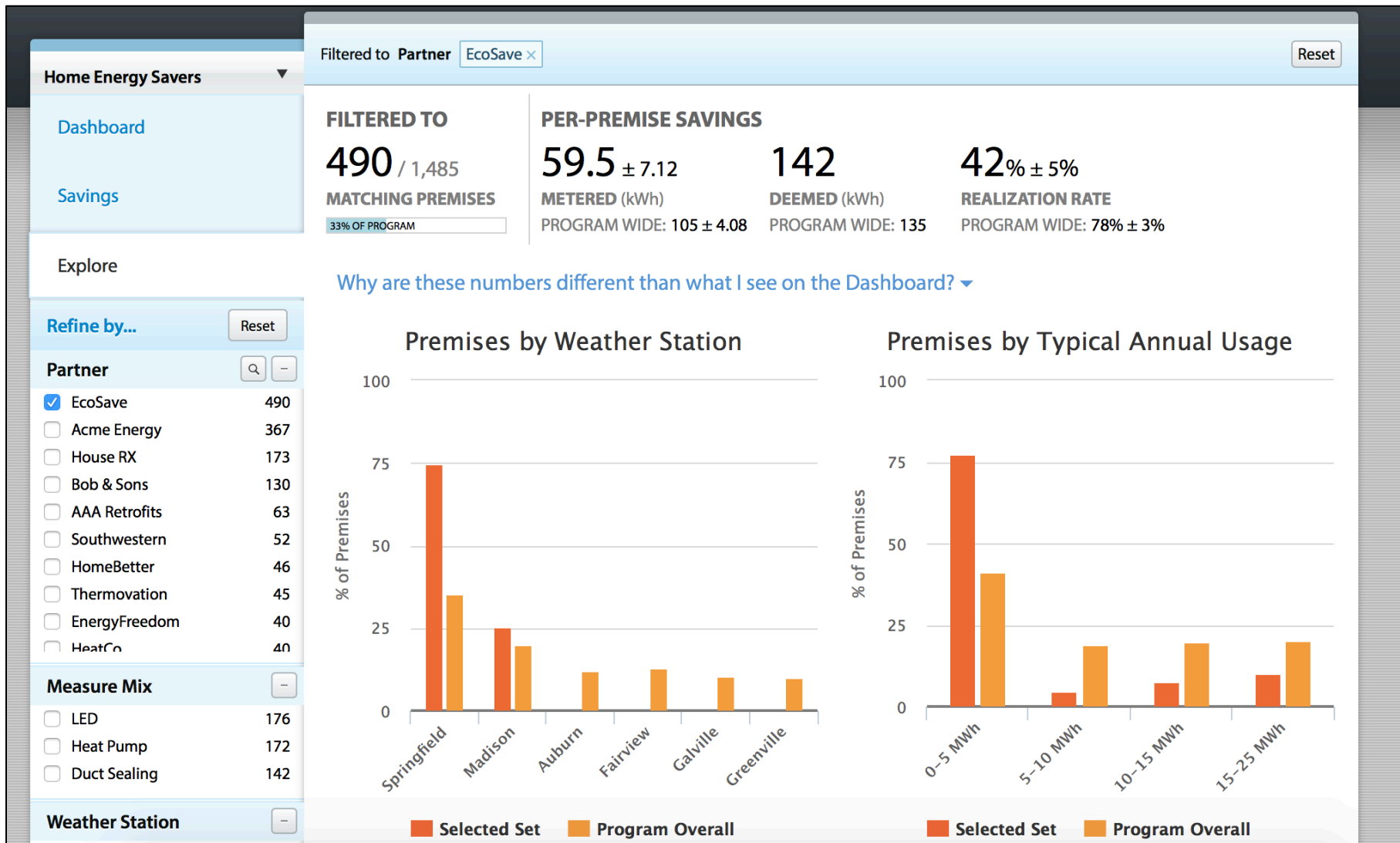
M&V 2.0: FAQ's

AMI or Interval data?
- 2.0 applications are meter agnostic and work with interval, monthly or bi-monthly meter data

10% of savings?
- A billing analysis with an M&V 2.0 approach can estimate savings down to 2-3%

Black box?
- EnergySavvy provides a written methodology to clients, evaluators and regulators. Same as done by traditional evaluators.

Replacing evaluation?
- M&V 2.0 tools enhance and support formal third party evaluation. They are not intended as a replacement.

What can M&V 2.0 do?

Capabilities offered by M&V 2.0 tools

❖ Updating deemed savings with local actual data

❖ Assessing persistence with continuous measurement

❖ Replacing deemed savings for ex-post M&V for certain programs

❖ Measuring "net" savings for certain programs*

❖ Providing process improvement data to program administrators

❖ Launching new pilots or estimating savings from HEMS (e.g. smart thermostats)

❖ Can provide independent analysis to evaluator and program administrator

*SEEAction Impact Evaluation Guide, Large-scale consumption data analysis approaches. pg 5-4, 5-5

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Where doesn't M&V 2.0 fit?

M&V 2.0 is not the best approach for all applications

- ❖ Artificial baselines require ex-post engineering adjustments to M&V 2.0 impact analysis

- ❖ M&V 2.0 cannot assess free ridership or spillover

- ❖ Not appropriate for certain program types (e.g. custom projects)

- ❖ Not designed for market studies or assessing penetration levels for certain technologies

M&V 2.0 Around the Country

M&V 2.0 In the States

State	M&V 2.0 Actions
NY	2016: PSC orders incentives related to EE net savings are "tied to advances in EM&V that utilize direct customer information." 2016: EM&V Guidance "encourages" use of "Advanced M&V" for data collection and analysis for impact evaluation
CA	2015: Order requires "data collection strategies embedded in the program" and "internal performance analysis during deployment." 2015: law defaults to use of "normalized metered energy consumption" for M&V
CT	2015 Order directs portion of annual EM&V budget to "direct measurement and verification" 2016 State receives DOE SEP grant for EM&V 2.0 pilots
NM	2016 Statewide RFP include optional scope for "M&V 2.0" solutions
MO	In progress: Report on how EM&V 2.0 can support deemed savings updates for statewide TRM

Basic Case Study

Does it work?
Is it accurate?
How long does it take?

Case Study: PSEG Long Island

PSEG LONG ISLAND

Can M&V 2.0 match the existing results in less time w/ bimonthly data?

Reproduce evaluation results with **M&V 2.0**

Reliable estimate of performance 7 months into program

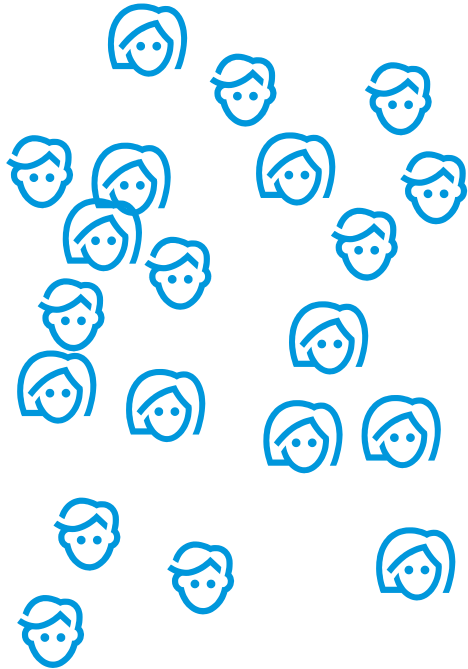1,100 Homes in HPD program

6%
margin of error

Case Study on Faster Feedback

How can M&V 2.0 optimize programs?

Case Study: Arizona Public Service

Challenge
Managing a large network of contractors

Solution
Monitor performance of individual contractors

60+ independent contractors

Continuous monitoring of programs and contractor performance
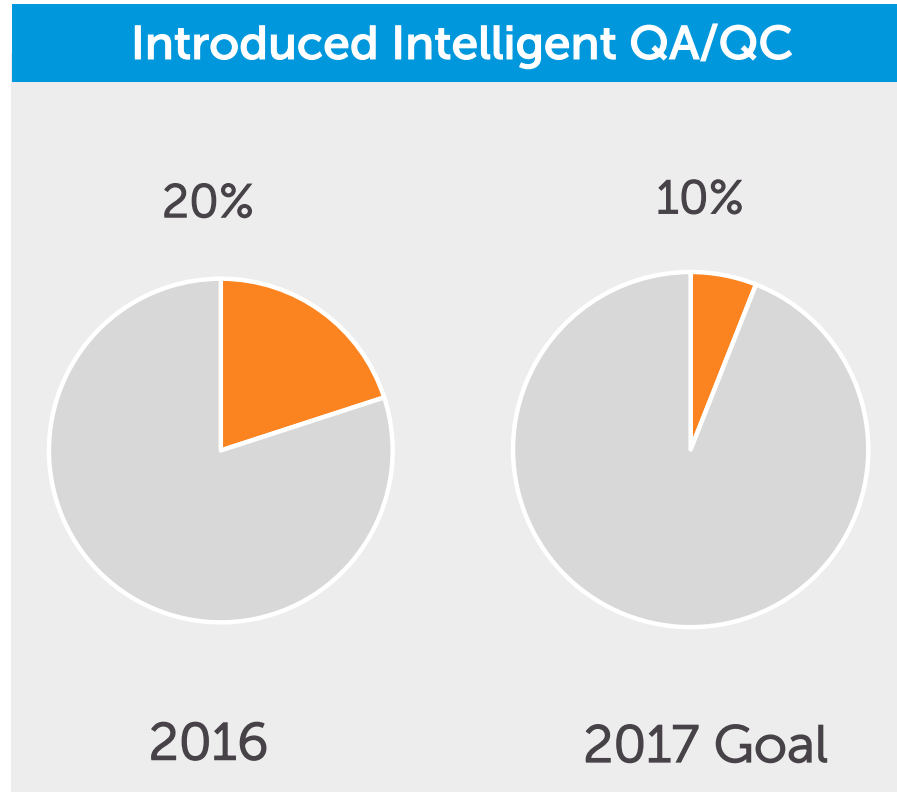
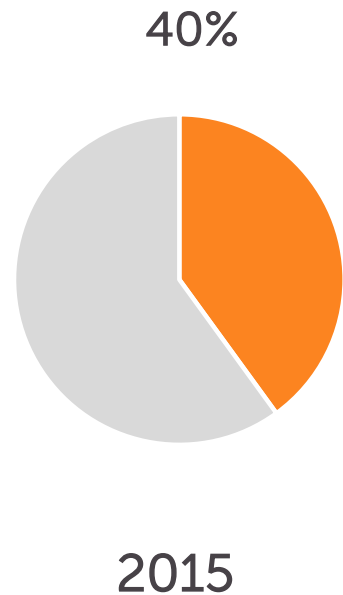# Case Study: Contractor Scorecard

Challenge
Contractors are unaware of their project performance

Solution
Issue scorecards to contractors to communicate performance of projects

Case Study: Attic Inspections

Introduced Intelligent QA/QC

40% — 2015

20% — 2016

10% — 2017 Goal

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)

How Can NH Pick Up M&V 2.0 Today

From the start, NH can begin in the lead

M&V 2.0 for EE Programs
- Support and enhance program evaluation and develop primary source data for a TRM

Calibrating savings
- Assess existing savings estimates in use today and calibrate values with local actual data

Oversee Complex Programs
- Start monitoring energy savings continuously to support program optimization.

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Thank you

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