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# UNIQUE INSIGHTS FROM USAGE DATA

LEVERAGING SAVINGS MEASUREMENT SOFTWARE

2015 ACEEE Intelligent Efficiency Conference

Boston, MA

December 7, 2015

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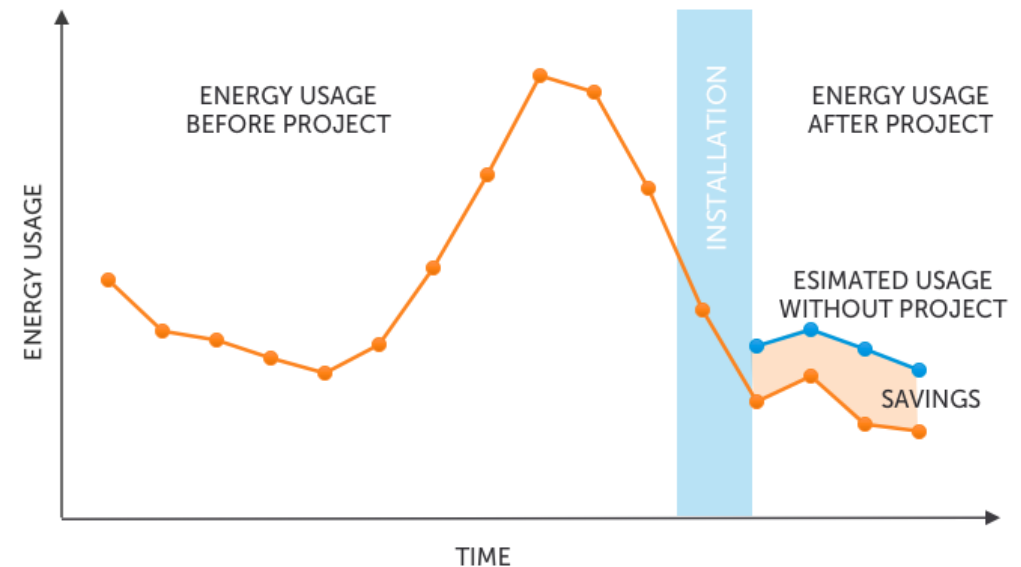


# Why Look to Usage Data for Insights?

## What is this savings information used for?

Historically, billing analysis has been manual, expensive, & selectively applied

- Key insights remain hidden
  - Who is a good fit for specific programs?
  - How are measures performing?
  - How do various factors impact results?
- What if you could see program impacts at each meter, continuously?
  - Strengthen QA/QC
  - Continuously improve programs
  - Trumpet success to customers



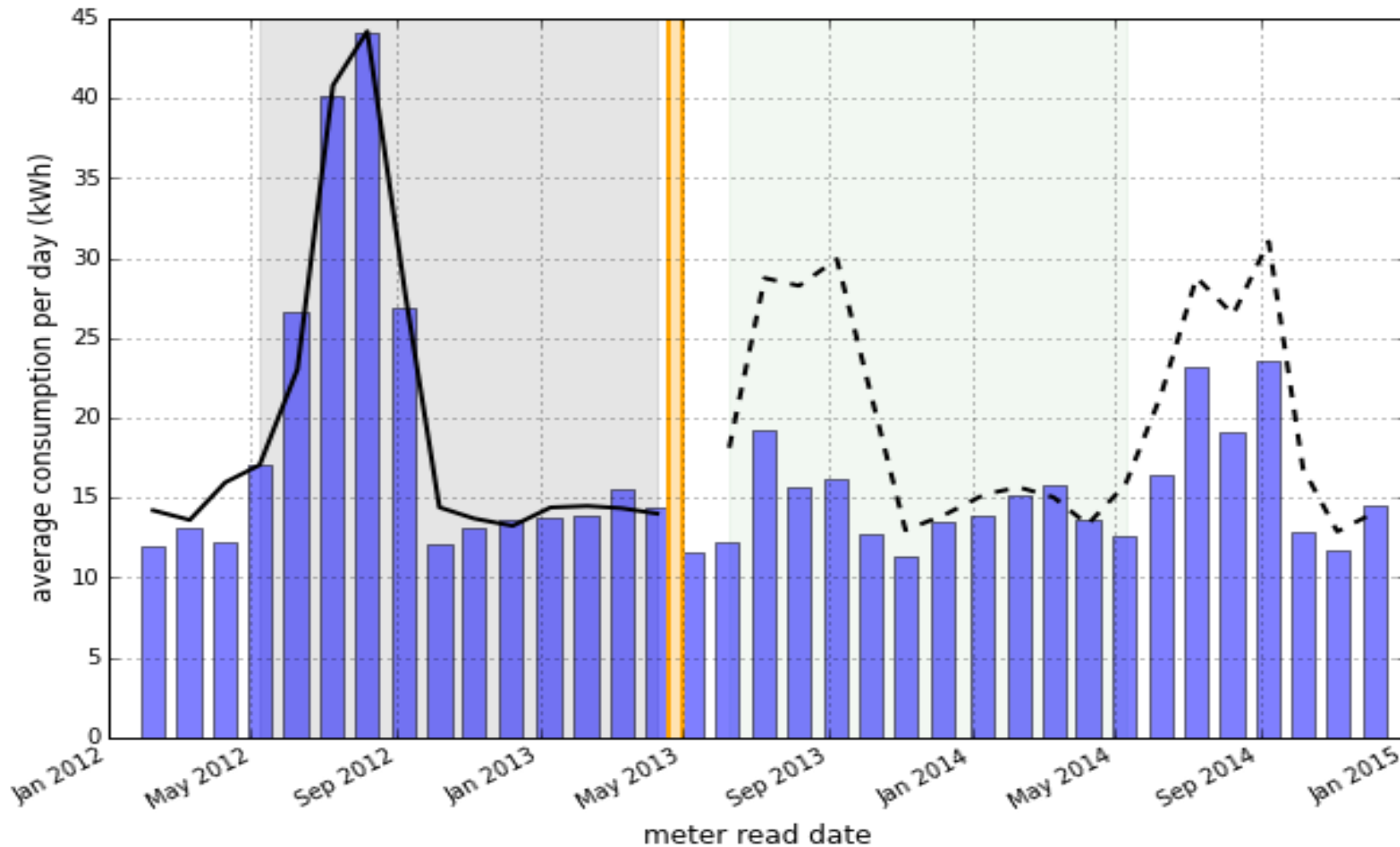
This is now possible. **Ameren Missouri** and **EnergySavvy** ran a historical study using **EnergySavvy's** Optix Quantify savings measurement software.

## HOW IT WORKS



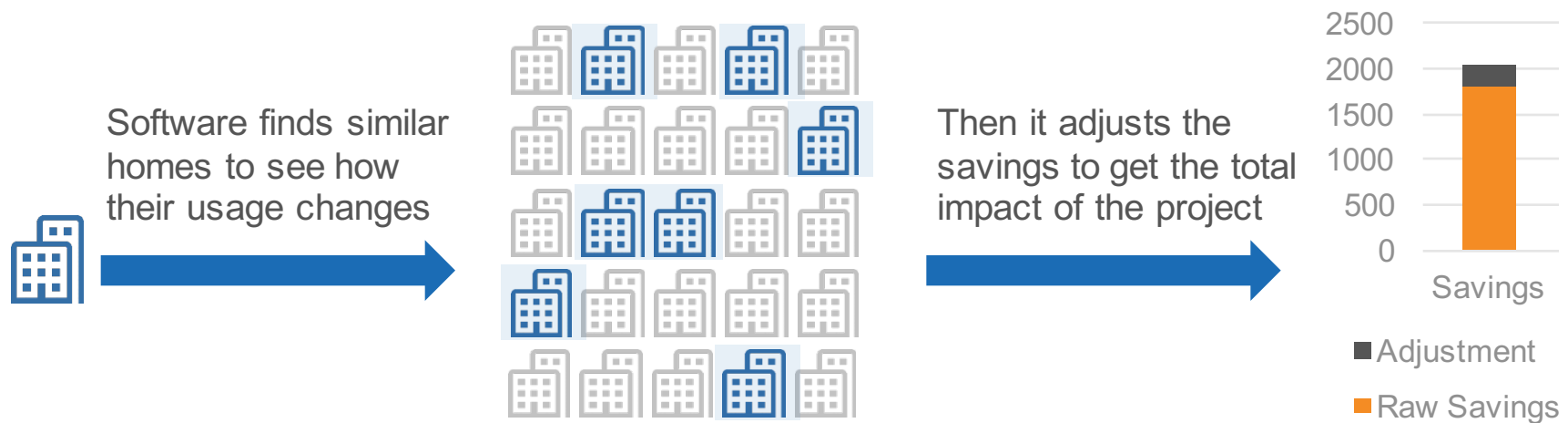
# Basic Steps of a Billing Analysis

## Calculating savings based on energy usage



# Analyze a Comparison Group

- Weather and projects aren't the only things that can affect energy usage
  - e.g. In an economic downturn or natural disaster, everyone uses less energy
  - Realization Rate, Free Ridership, Spill Over
- Apply the same models to entire population of non-participants

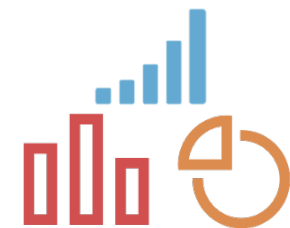
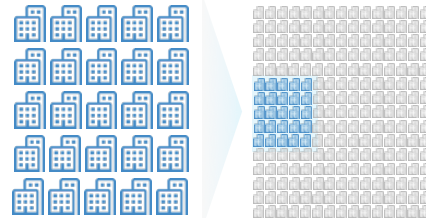


- Do this automatically and continuously for every projects in a given program.

# Putting It All Together

Producing accurate and unique insights

EnergySavvy's Optix Quantify: savings measurement software



Billing analysis on **each** project in the program

Comparison group adjustment to account for population-wide trends

Automatically, **continuously** update calculations as new data become available

Slice and analyze results to identify factors impacting performance

# Potential Outputs

## What is this savings information used for?

Continuous monitoring and program improvement, e.g.:

- **Identify factors** – measures, trade allies, usage, locations, etc. – that are contributing to over- or under-performing projects
- **Catch issues** before they are identified in third-party evaluations
- **Remotely monitor** thousands of projects
- **Target** on-site QA/QC inspections, internal auditing, implementer/trade ally management
- **Improve the TRM** through strategically-directed research
- **Notify customers** proactively of their savings progress (on the roadmap)

# Objectives of Ameren Missouri Optix Quantify Historical Study

- Streamline EM&V processes and reduce overall costs for future programs
- Identify likely drivers of variance in the program and measure-level realization rates.
- Demonstrate the ability to rapidly evaluate new programs/measures.
- Automatically and continuously calculate metered savings.
- Identify and diagnose program performance issues during the program year.
- Reduce low-value manual work associated with EM&V.
- Provide EnergySavvy with objective product feedback.



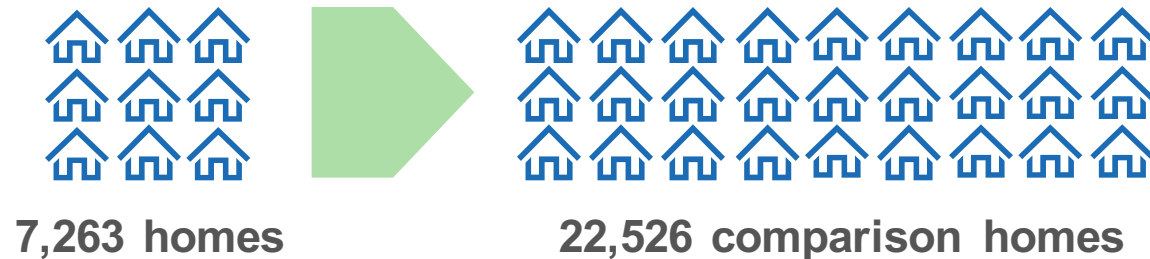
# Ameren Missouri / EnergySavvy Study Timeline

- **May 8** Data review & analysis begun
- **Aug 3** Shared initial results
- **Aug 17** Shared trial web app, received feedback
- **Sept 3** Deep-dive into methodology details
- **Sept 16** Quantify use cases – tool for program improvement
- **Oct 5** Final deep-dive analysis

# Ameren Missouri / EnergySavvy Study Results

## From the 2013 Ameren Missouri CoolSavers Program

### Directly Analyzed



### Measure Findings

- ASHP deemed savings can be higher than a home's typical usage (!)
- Single measure projects seem to be outperforming multiple measure projects

### Contractor Findings

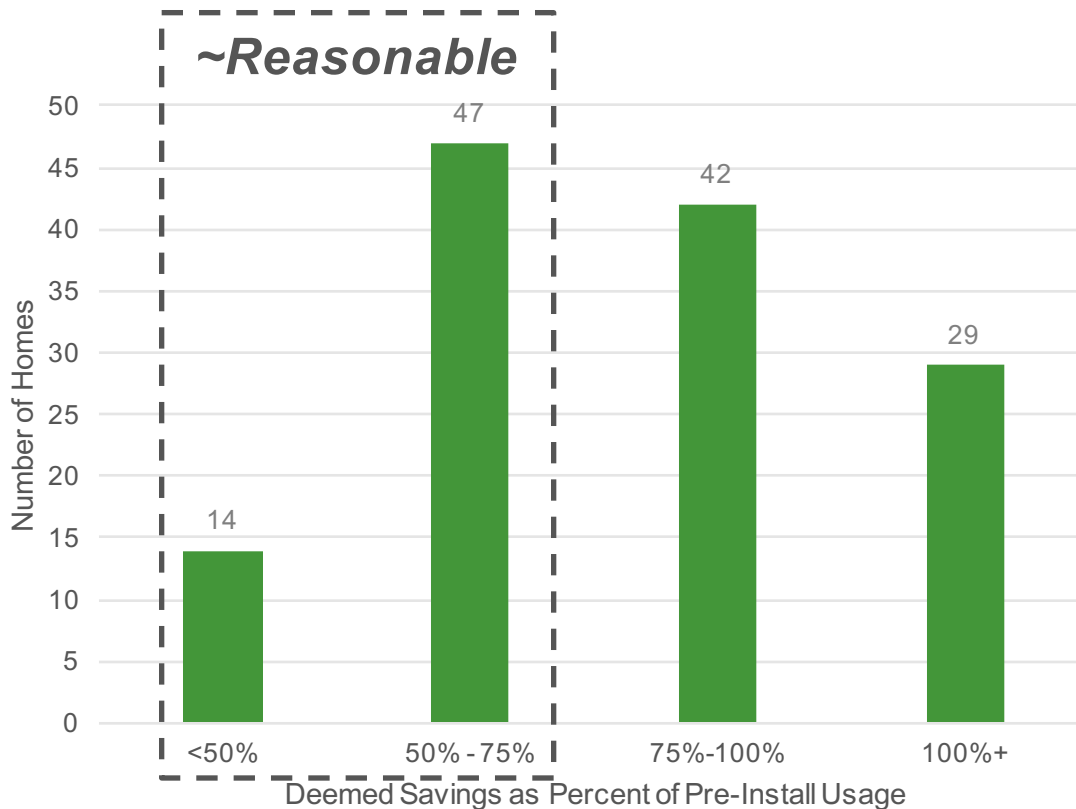
- One contractor's savings performance far exceeds others
- Largest contractor getting very poor savings performance

### Timeliness of Insights

- Each of the above insights would have been available mid-way through the PY

# ASHP–Electric Furnace Early Replacement

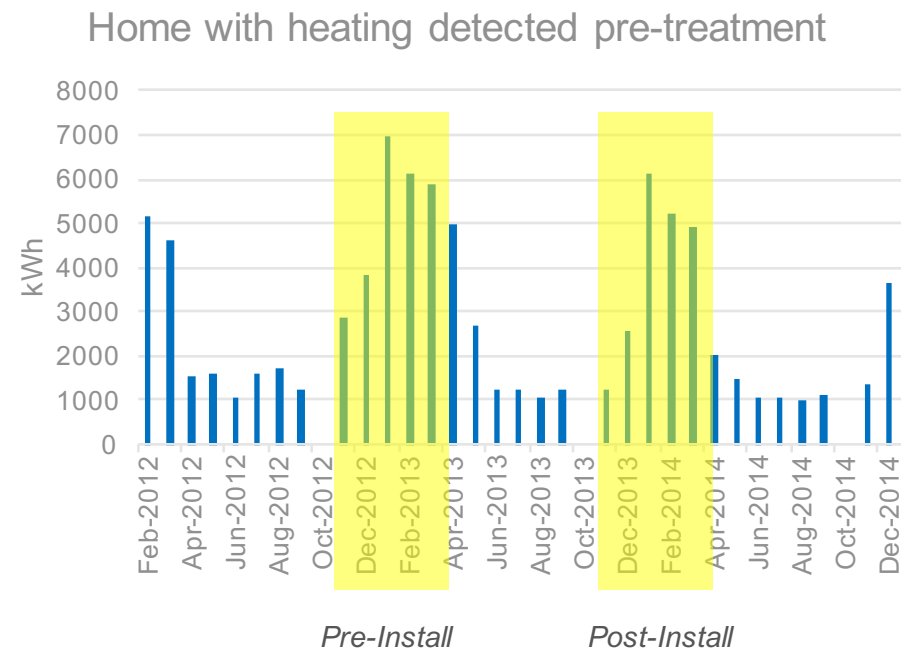
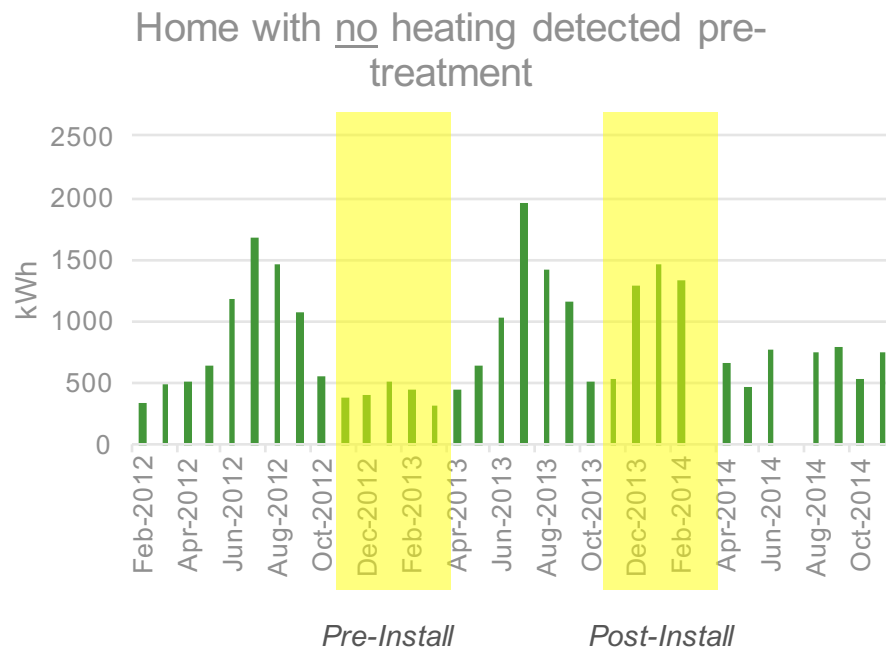
- Deemed savings values very high compared to typical annual usage



- **Take-away:** The deemed values for this measure are too high, and the evaluated results are not accounting for real-world feasibility
- 29 (of 132) homes (**22%**) had deemed savings **higher** than the home's typical annual usage
- 42 (**32%**) of homes would have to save more than 75% of their annual usage.
- **6%** of the total deemed savings for homes with this measure were **impossible, greater than 100%**

# ASHP–Electric Furnace Early Replacement

- Usage data shows some homes weren't using much electricity to heat



- The one with electric heating has the highest usage in winter.
- The one without actually increases usage in winter after the ASHP.

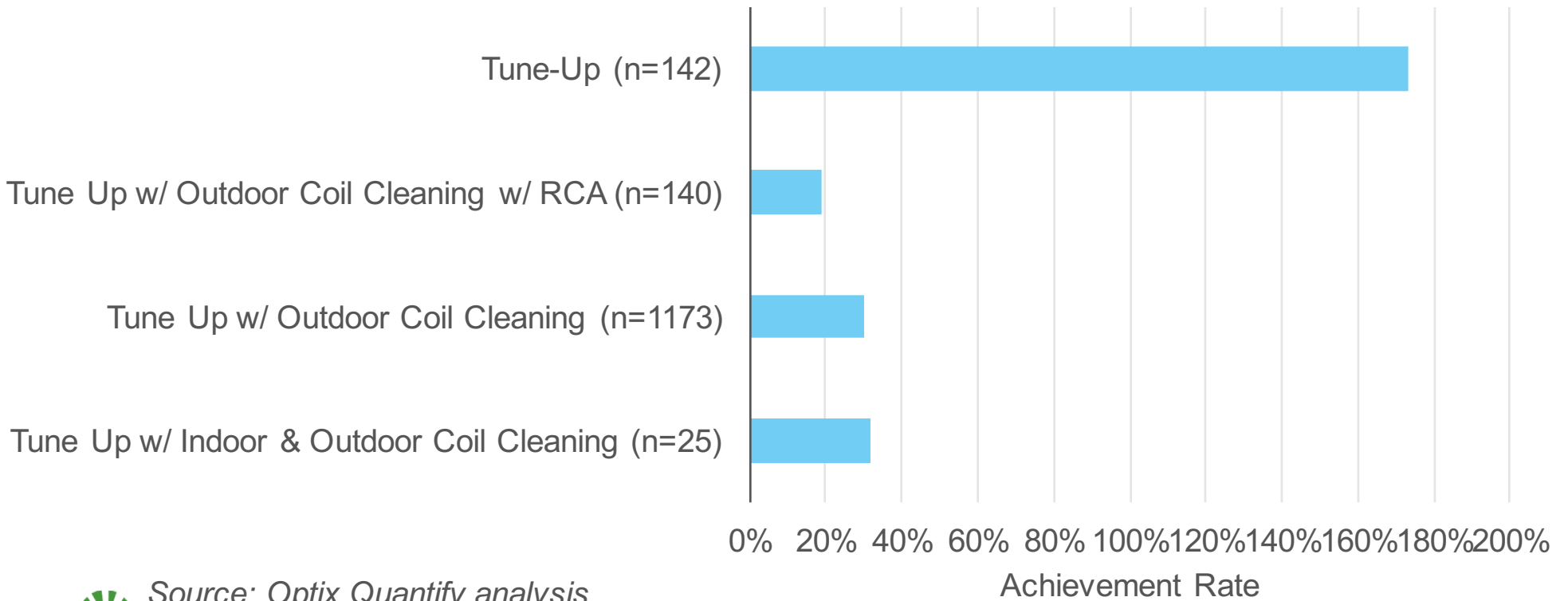
## Interactive Effects: CAC 14 SEER

- Optix Quantify found examples of measures that may behave differently when installed together. This is something Ameren MO could use to further TRM research.
- For example, CAC 14 Early Replacements perform better on their own than when combined with other measures.

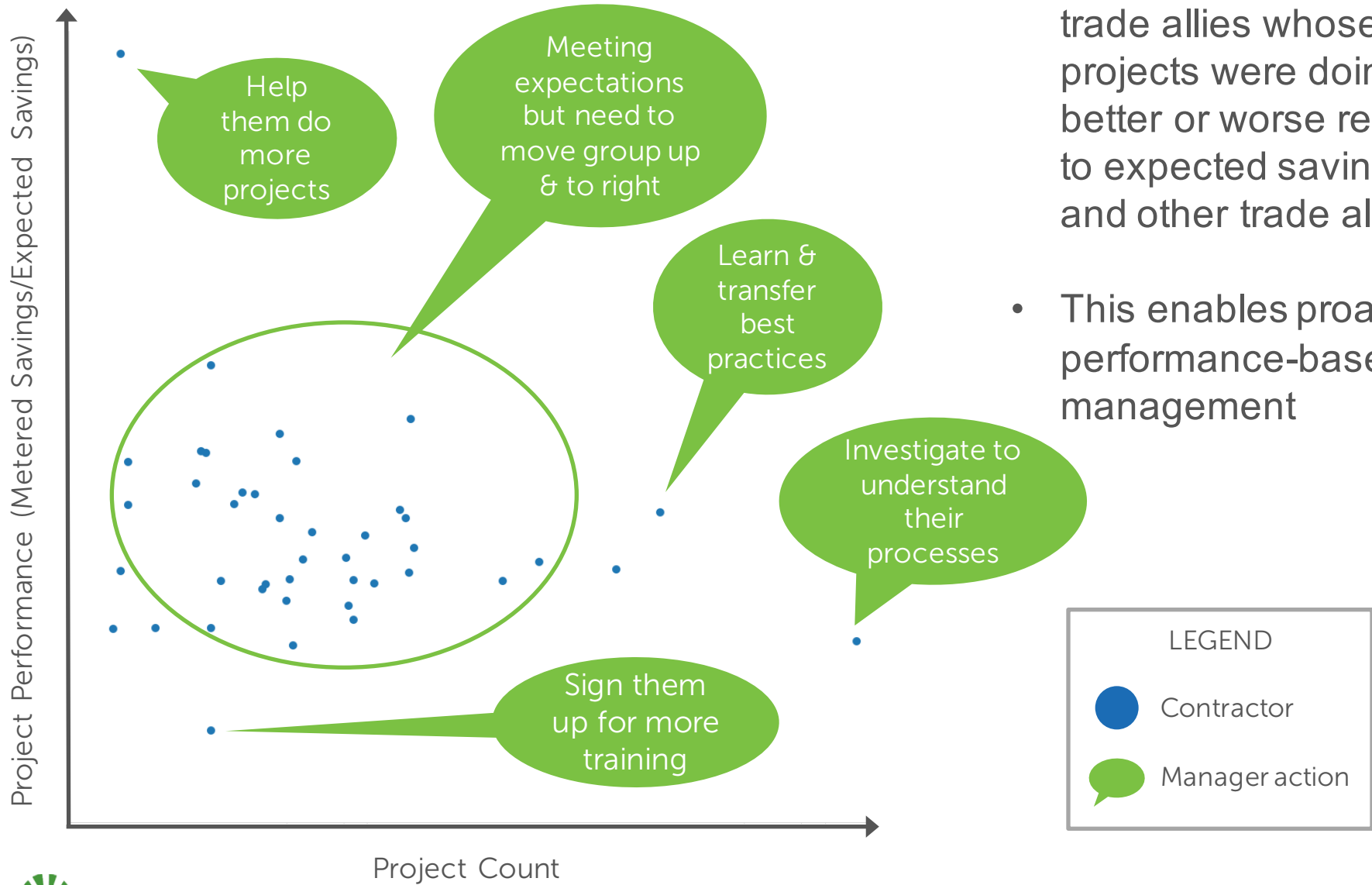
Measure	Achievement Rate
CAC 14 Early Replacement	48% ± 6%
CAC 14 ER <i>with</i> Programmable Thermostat	35% ± 5%
CAC 14 ER <i>with</i> Fan Replacement	35% ± 11%
CAC 14 ER <i>with</i> Fan and Programmable Thermostat Replacement	34% ± 6%

# Interactive Effects: Tune-Ups

- Tune-ups alone outperformed combination measures
  - All tune-ups saved on average ~270 kWh per home.
  - Low achievement rates for measures where ex ante values are high
    - E.g., Expected savings for Tune-up w/ outdoor (condenser) coil cleaning is 833 kWh/home. Quantify identified 254 kWh/home.



# Proactive Trade Ally Management



- Quantify identified trade allies whose projects were doing better or worse relative to expected savings and other trade allies
- This enables proactive, performance-based management

# Timely Insights

## Supporting continuous improvement

If software had been running during the program year, when would each of these key insights have been identified?

- ASHP-EF Early Replacement: August 2013
- CAC SEER 14: August 2013\*
- Tune-Ups w/ Coil Cleaning: August 2013
- Contractor performance: July 2013\*

*\*Some combinations took longer*



# Summary / Recap

- **Using this software during the program year will:**
  - Perform remote QA/QC on every project
  - Identify problems to keep programs cost effective
  - Identify poorly performing contractors before they impact program savings and customer satisfaction
    - Provide targeted contractor training
  - Recognize top performing contractors and encourage them to complete more projects
  - Use data to update the TRM deemed values
  - Support targeted evaluation research and analysis
- **Future opportunities for savings measurement software:**
  - Communicate project results with customers
  - Allow EE to serve as a trusted resource for our grid operations team

# Overall Results

- Improve program energy savings
- Reduce program costs
- Improve customer satisfaction

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