

Lessons Learned: Measuring Program Outcomes and Using Benchmarks

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RESIDENTIAL NETWORK

Better Buildings Residential Network: Connects energy efficiency programs and partners to share best practices to dramatically increase the number of homes that are energy efficient.

Membership: Open to organizations committed to accelerating the pace of existing residential upgrades. Grantees choose to join.

Benefits:

- Peer Exchange Calls
- Tools, templates, & resources
- Newsletter updates on trends
- Recognition: Media, materials
- Optional benchmarking
- Residential Solutions Center

Commitment: Provide DOE with annual number of residential upgrades, and information about benefits associated with them.



RESIDENTIAL NETWORK

Inaugural Members:



Austin Energy



Boulder County



Local Energy Alliance Program (LEAP)



New York State Energy Research & Development Authority



Mountain Association for Community Economic Development (MACED)

For information & to join, email bbresidentialnetwork.ee.doe.gov

- **Measuring Outcomes**

- Value and Perspective
- Goals and Outcomes
- Setting SMART Goals
- Cost to Achieve Outcomes
- Assess Effort to Measure

- **Using Benchmarks**

- Examples
- Proposed Guide for Program Progress Benchmarking

- Discussion

- Program Type & Funding
 - Outcome Metrics & Costs
 - Conversion Rate
 - Energy Savings
 - Program Costs
 - Next Steps



If at first you don't succeed...

Success is what you define as the goal and objective of your program.
But, if you can't measure it, how will you know if you reached it?



- Measuring program outcomes is a key to being successful
- Measuring program outcomes should be an integral part of program design planning
- Collecting and aggregating the information to measure program outcomes is challenging and should be assessed prior to making commitments
- Benchmarks can help set realistic goals, measure performance over time, and identify areas for improvement

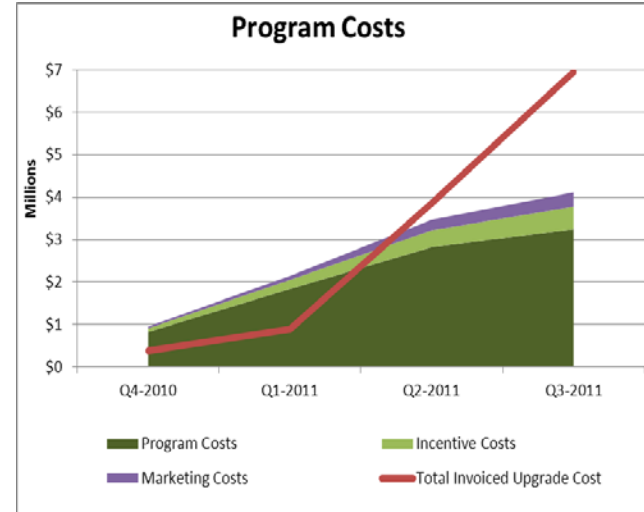
Today's webinar is intended to start a conversation about plans to draft a Guide for Program Benchmarking

- Draft available for stakeholder comment this Fall and an online tool for optional Better Buildings Residential Network (BBRN) program benchmarking next year

Measuring Program Outcomes:

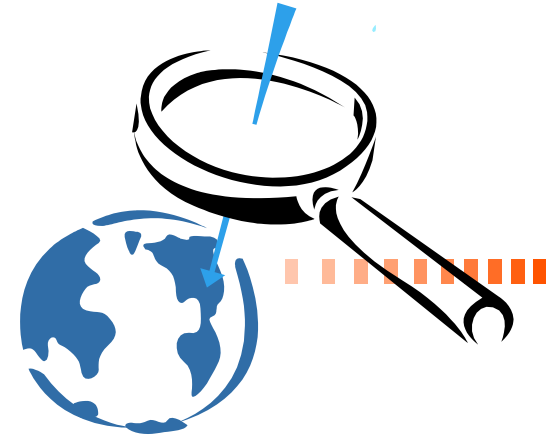
- 1) Communicate progress
 - Policy goals are being achieved (energy savings, jobs, etc.)
 - Spending of public funds is effective
- 2) Assess when and where to make program design changes
 - Spend less time trying to create the perfect program design and more time measuring progress so that you can improve your design.
- 3) Justify continued or additional investment

However, individuals collecting or providing the data may not see the value for their immediate goals.



What is Your Perspective?

- Measure (installed improvement)
- Project
- Building
- Portfolio
- Sector
- **Program**
- State
- Region
- Country



most examples discussed today are from this perspective

What we will discuss may also be useful if you have a different perspective.

A program outcome is a measureable achievement that identifies progress toward a goal.

- Goal: Improve the EE of homes in my community.
- Outcome: Trained 20 new technicians in Building Science Fundamentals
Closed 150 EE loans
Participating contractors reported 180 home energy upgrades completed
The average participant saved 18% on energy bills

When planning your program, it is critical to consider what to measure.

Personal Example

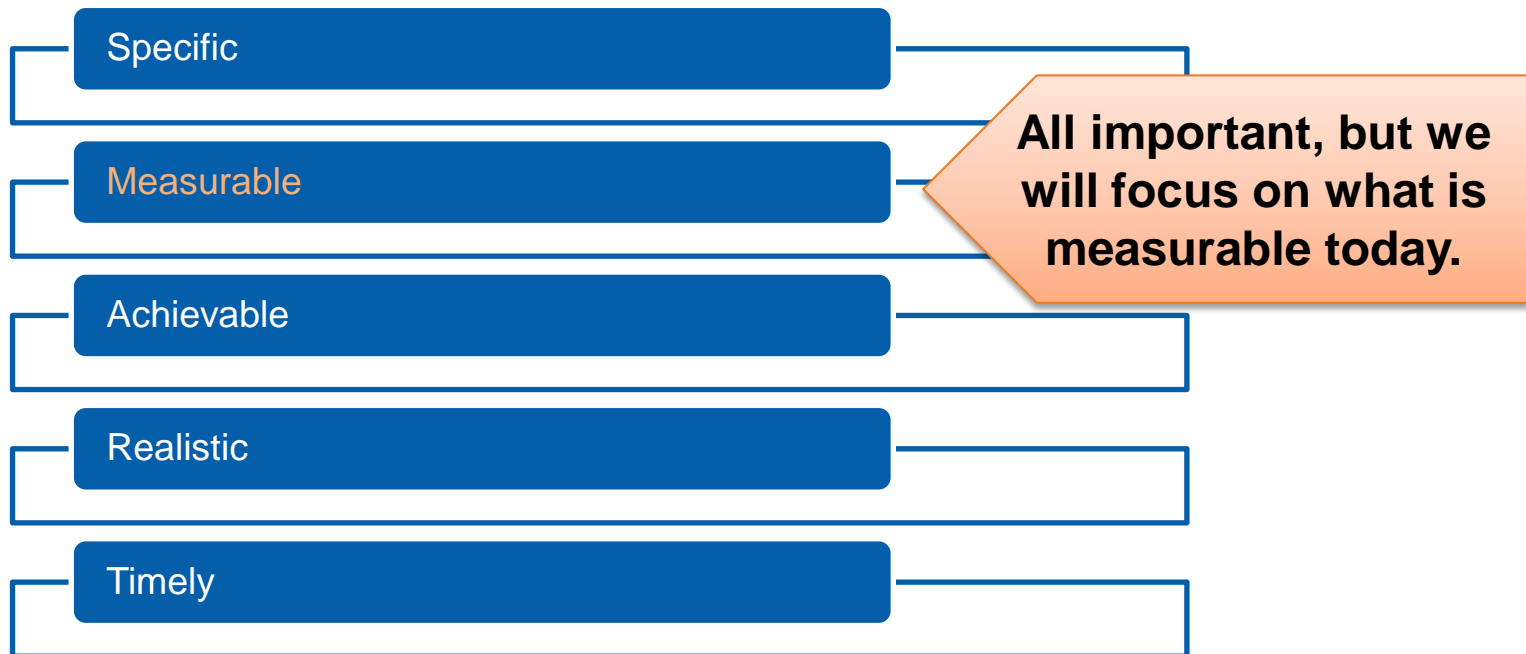
Goal: Beat My Personal Record
(1:19:16 for 10 mile)

Outcome: Average mile pace
less than 7:50



Setting SMART Goals

SMART is a mnemonic, giving criteria to guide in the setting of objectives.



Example: Achieve an average energy reduction of 20% for at least 300 homes in my community in 2013.

SMARTER gives two additional criteria, evaluate & reevaluate, to ensure targets are not forgotten.

What to Measure and Why

Outcome to Measure	Question to Answer
Annual Energy Saved by energy type	Were estimated energy savings realized?
Life-time Energy Saved by energy type	Are more participants or deeper savings per participant needed to achieve energy savings goals?
Percent Energy saved	How much energy was saved compared to the total energy used? Was it a significant change?
Buildings Upgraded	What percentage of the market/available stock was improved?
Buildings Audited, Benchmarked, Scored or Rated	How many homeowners were made aware of their homes' energy efficiency or performance?
Invoiced Project Cost	Did the total investment in building improvements exceed the amount invested to encourage those improvements?
Loan Amount	What is the average or total amount loaned?
Loan Defaults	Do loans have lower risk?
Certified Individuals (assessors, raters, contractors)	Is the professional workforce growing? What is the supply of active workforce?

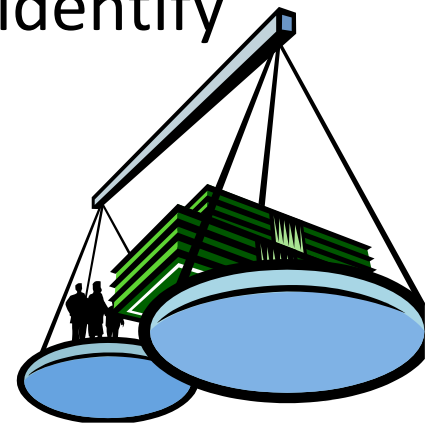
What is the Cost to Achieve Outcomes?

Although achieving an outcomes may be difficult enough, you will likely need to also achieve it at reasonable cost.

Tracking your progress versus costs helps you identify what approaches are most cost-effective.

Program Cost vs Program Outcome Examples

- Total Program \$ Spent / Upgrades Completed
- Total Program \$ Spent / Present Value of Lifetime Energy Cost Savings
- Total Program \$ Spent / Invoiced Cost (investments in building improvements)
- Marketing \$ Spent / Customer Acquired
- Workforce \$ Spent / Certified Individual or Participating Contractor



Measurable: kWh saved, homes improved, workers trained, market penetration



Total Lifetime energy savings from all participants is measureable, but at what cost/burden?

Before committing to a goal, assess what data you need to collect, consolidate, clean and analyze to measure it.

- Are savings estimates acceptable?
- How soon can it be measured? Three years or less?
- What type of mechanisms should be used to collect and store the data?
- How much will it cost?

Example

Program Goal: Reduce the average participant's energy use 20% compared to last year.

Program Goal: Increase participation 5% from last year.

What data needs to be collected to measure achievement of the goals?

- Annual energy consumption (or an estimate) before participation for each participant.
- Annual energy consumption (or an estimate) after participation for each participant.
- Weather data
- OR an estimate of the percent of energy saved by each participant.

- Total number of participants.
- Total number of participants from the previous year.

How to Avoid Chasing Your Data Collection Tail – Future Webinar

Defining a measurable goals and objective is the *easy* part, whereas **collecting, cleaning, and aggregating** the information to measure it seems to be **more challenging and cost intensive**.

Unless your data collection and aggregation process is

- Reliable,
- Easy,
- Consistent,
- Timely,
- Transparent



you can't efficiently and effectively measure your objective.

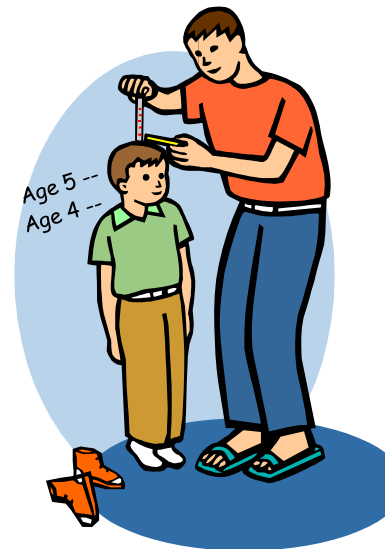
A stylized graphic of a building on the right side of the slide. It has a light blue triangular roof, a light green rectangular body, and two white rectangular windows. The building is partially cut off by the right edge of the slide.

Using Benchmarks To Identify Goals and Track Progress

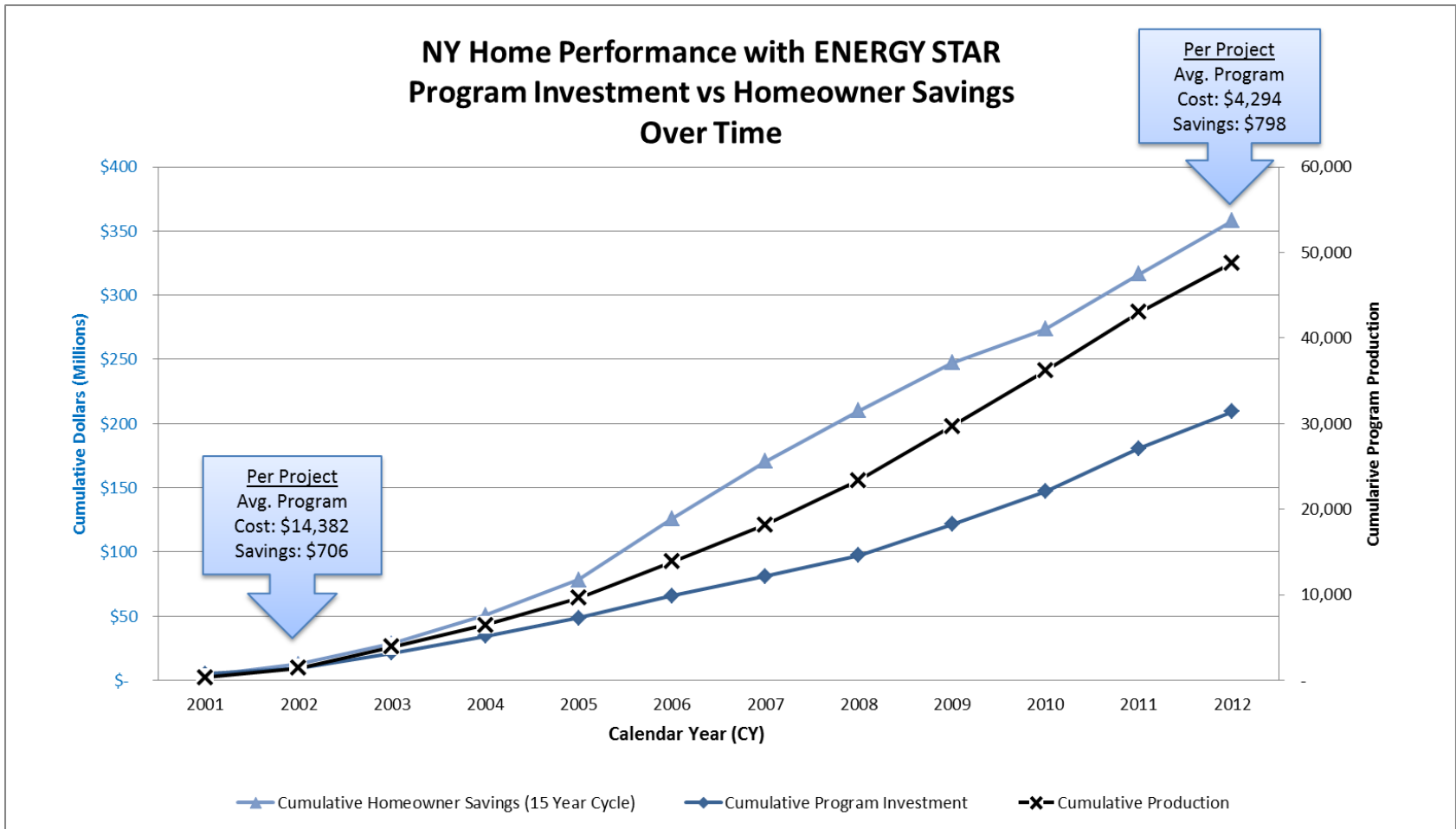
Why Use Benchmarks?

A standard or point of reference in measuring or judging the current value or success of your company in order to determine your future business plans (entrepreneur.com)

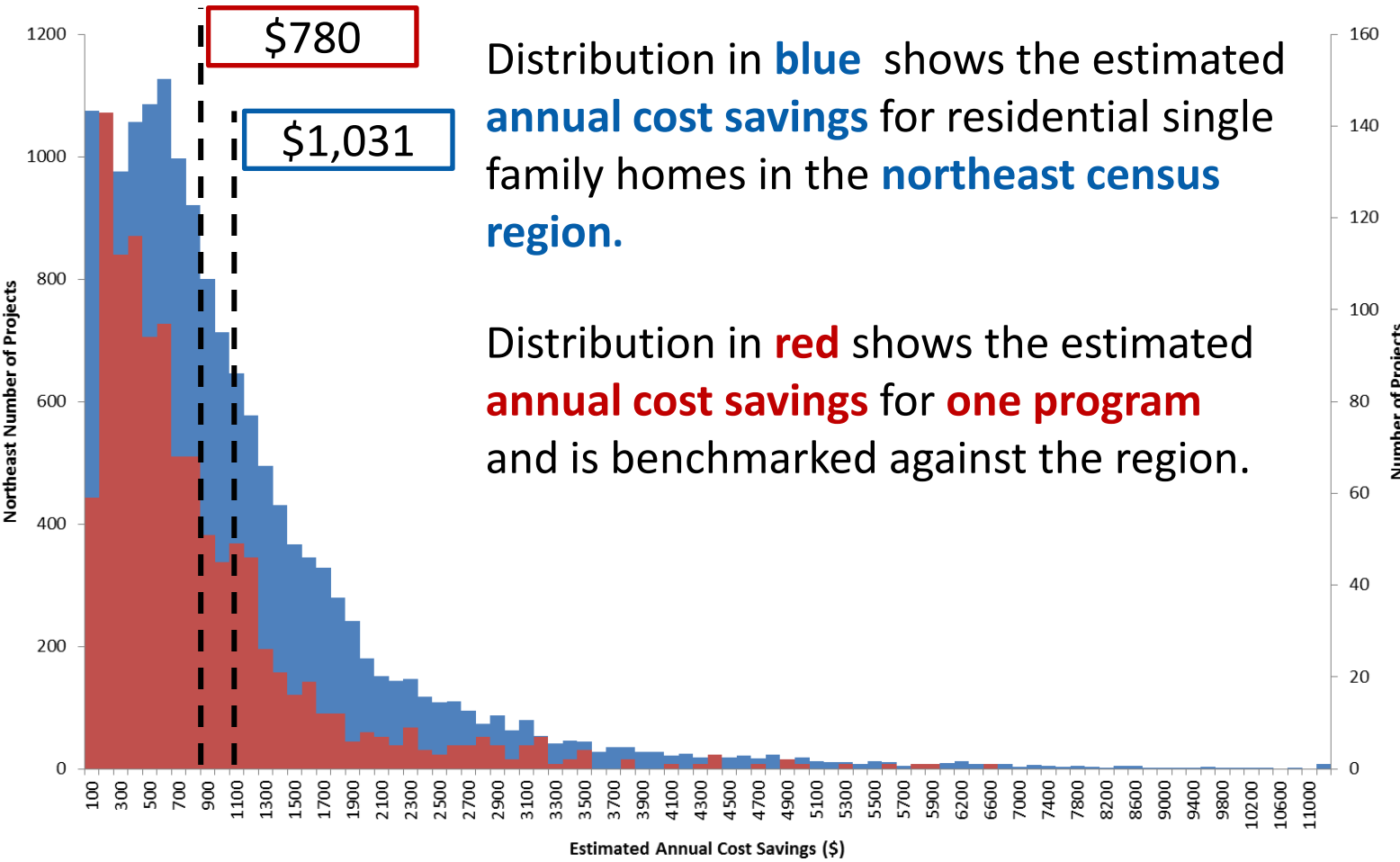
- Benchmarking can be applied to any business process or function
- Identify markets, buildings or program performers that are energy leaders or laggards
- Identify targets (SMART goals)
- Identify program problem areas
- Measure performance over time (compared to past performance)
- Measure performance compared to peers (sector, regional, national)



Past Performance as a Program Benchmark

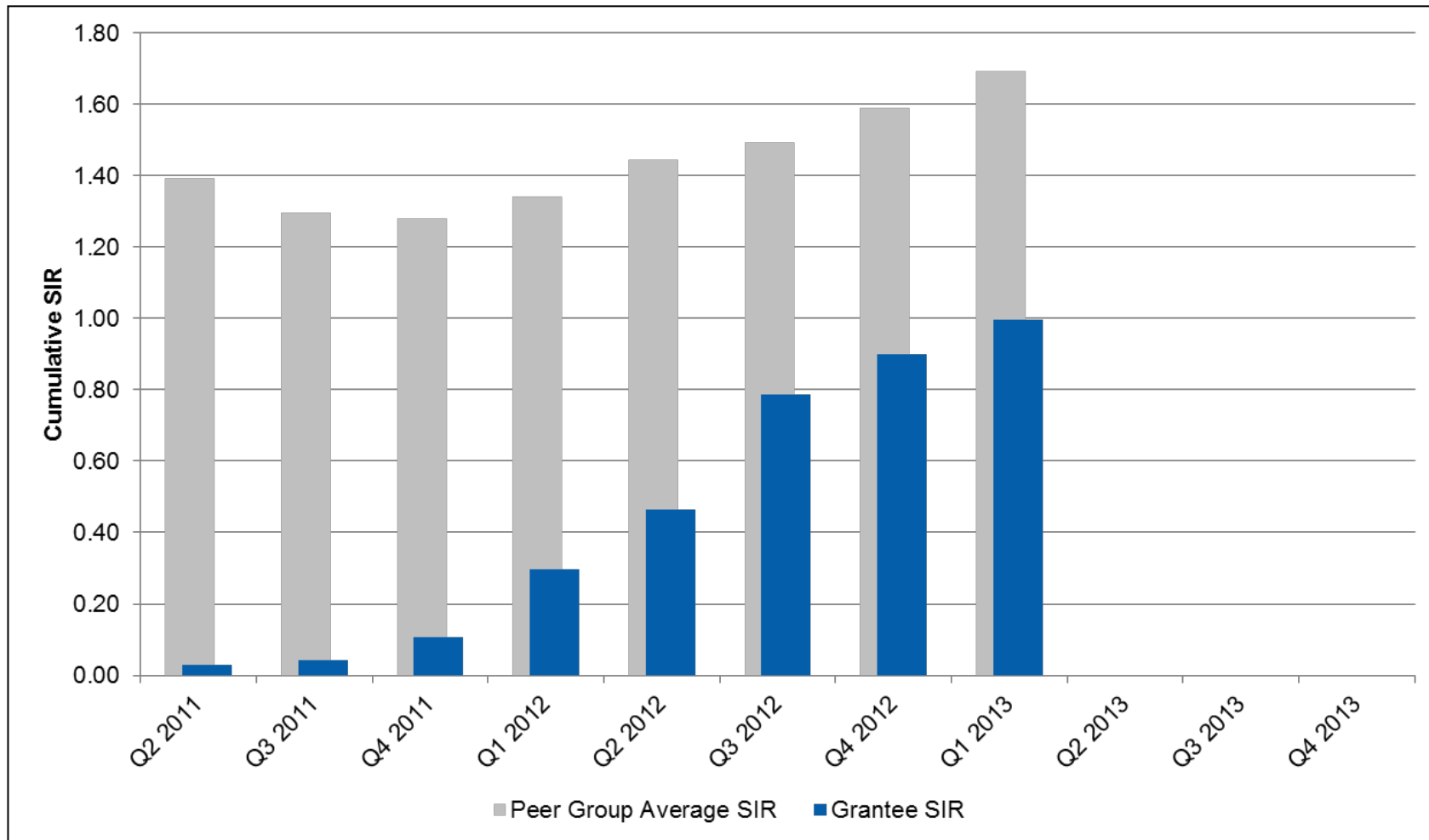


Regional Average as a Portfolio Benchmark



Programs could also use this type of information to track and assess performance of participating contractors within their program.

Average Peer Group SIR as a Benchmark



savings-to-investment ratio (SIR)

illustrative example

Benchmarking Program Progress

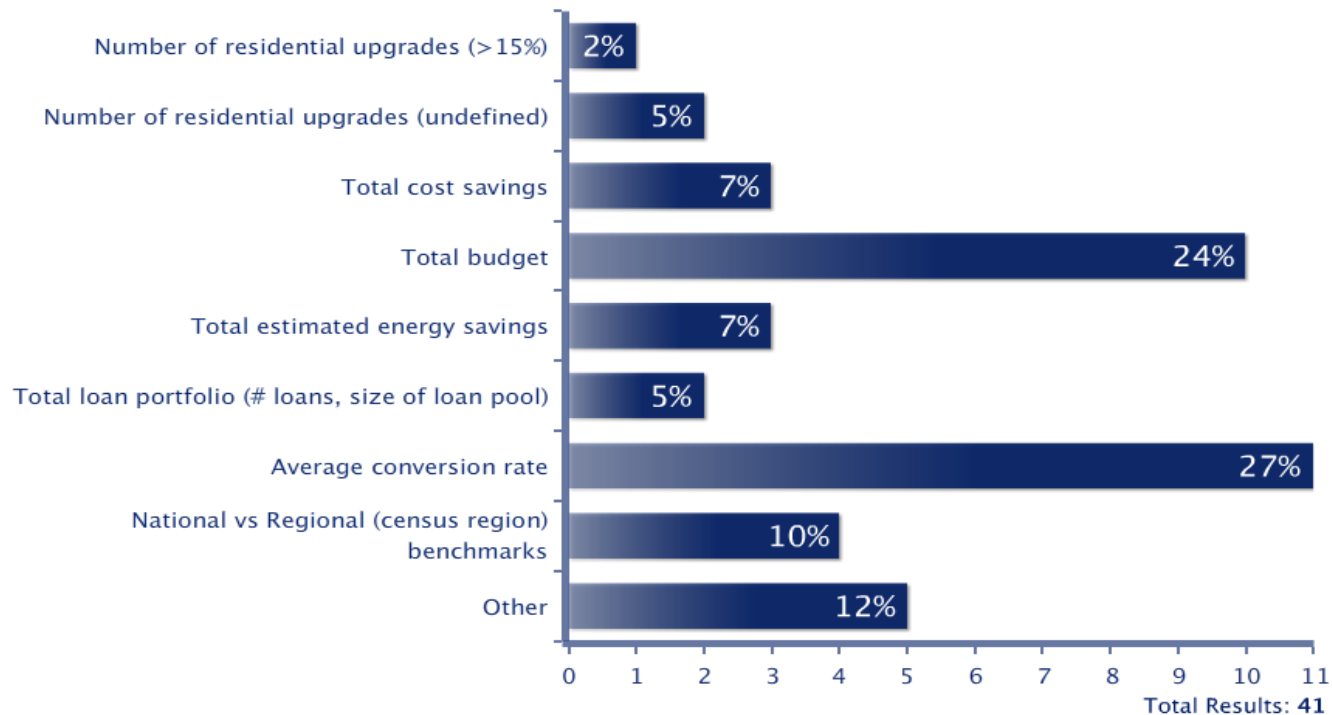
- Better Buildings Residential Network (BBRN) plans to develop a Guide for optional Residential Program Progress Benchmarking
- Members will be engaged in the Guide's development
- Ideas for inclusion, for members feedback:
 - A list of definitions and protocols for measuring and categorizing outcome metrics (e.g. program types, expenditure categories, life-time saving calculation)
 - The value of each outcome metric (e.g. marketing cost/participant is used to evaluate different marketing approaches.)
 - Required data and dependencies (e.g. the estimated life of each measure is needed to estimate lifetime energy savings)
 - Relative difficulty to collect data or perform analyses
 - Steps to complete and compile (i.e. template and instructions)
 - Examples



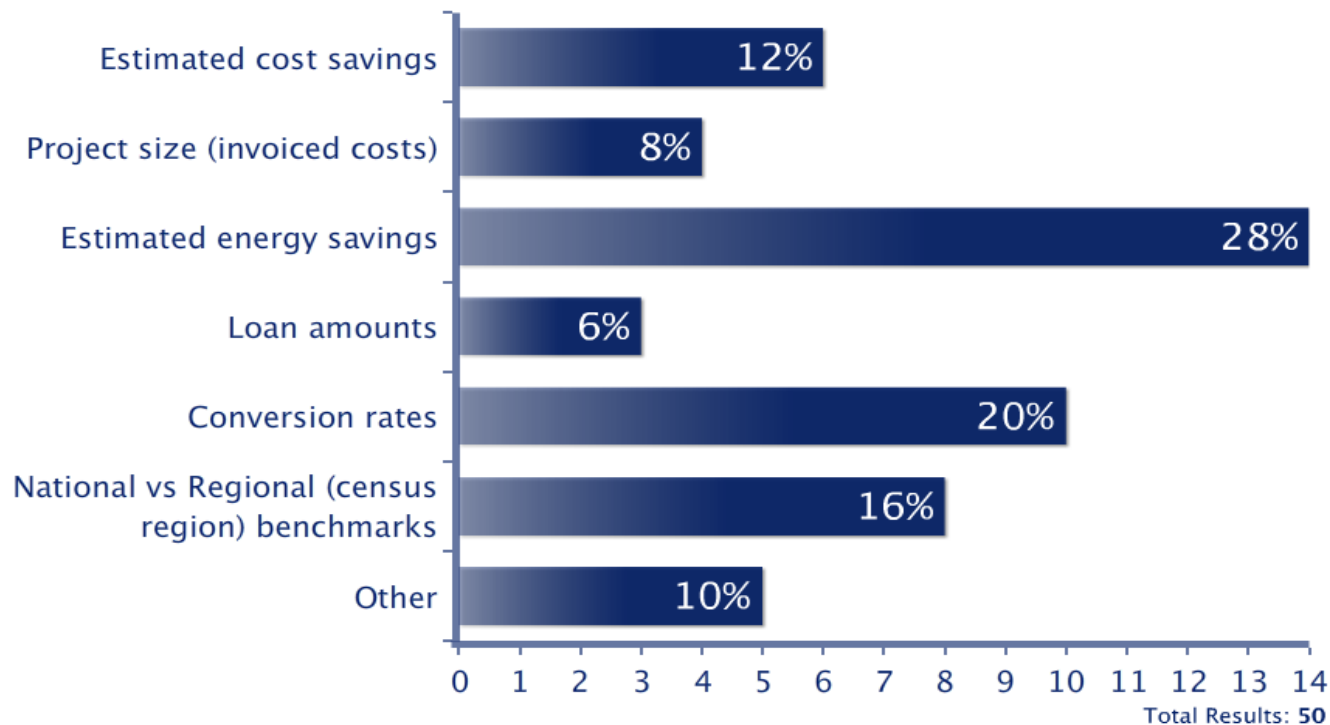
Next Steps

- [Today's Webinar] Start a conversation to get preliminary feedback about Measuring Program Outcomes and Using Benchmarks.
- BBRN to draft Guide for Optional Residential Program Benchmarking for Stakeholder Comment (Fall 2013)
- Finalize Guide and Pilot with Up to 8 Better Buildings Residential Network Partners (Winter 2013-14)
- Evaluate Pilot and Revise for Online Tool (Spring 2014)
- Test Beta of Online Tool (Summer FY14)

What program-level benchmarks would be most useful to you?



What project/portfolio benchmarks would be most useful to you?



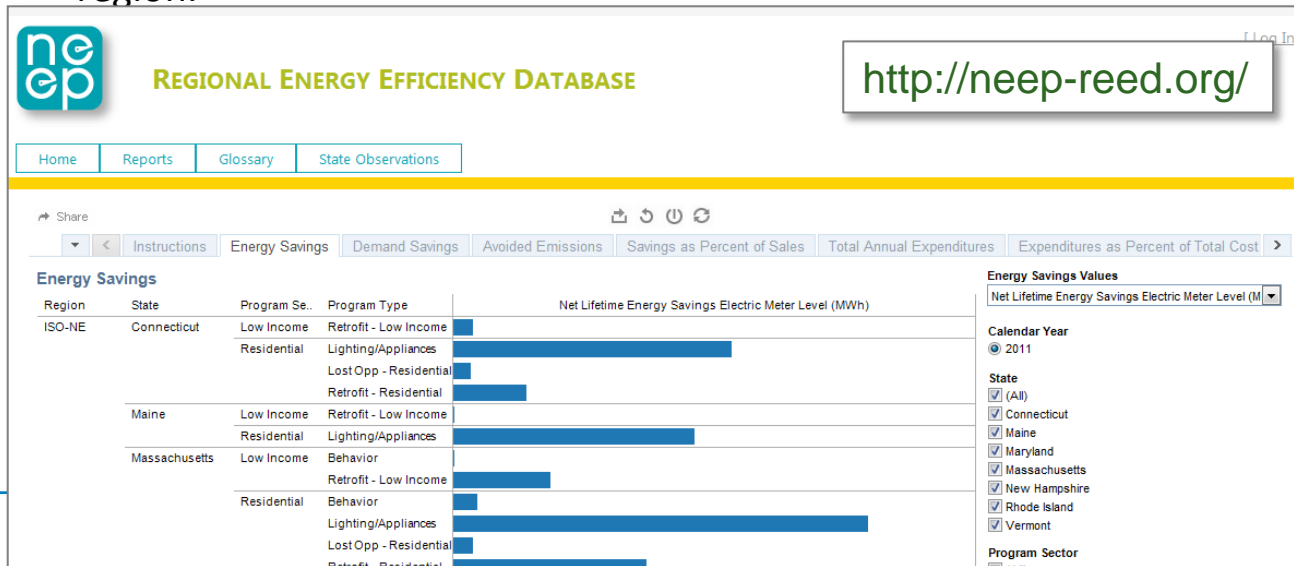
Existing Resources

- Definitions from State Energy Efficiency Action Network (SEE Action) [Impact Evaluation Guide](#)

- Definitions used by Lawrence Berkley National Lab (LBNL)/Consortium for Energy Efficiency (CEE) to compile programs database

- Regional Energy Efficiency Database (REED)

In 2010, the [Regional Evaluation Measurement & Verification \(EM&V\) Forum](#) developed [Common Statewide Energy Efficiency Reporting Guidelines](#) with state-level reporting templates and several process recommendations that provide for consistent reporting of electric and natural gas energy efficiency program energy, associated costs, and job impacts across the region.



For Discussion: Program Type & Funding

Residential Program Types

- Whole Home/Direct Install
- Whole Home/Audit
- Whole Home/Retrofit
- Multi-Family
- Financing
- Prescriptive
- Behavior/Online Audit/Feedback
- Consumer Product Rebate

LBNL/CEE has definitions for program type, but we could edit.

It is important to categorize a program for comparison to peers, but too many categories results in too few peers to compare to.

Funding Source

- Ratepayer
- GHG Proceeds
- Wholesale Capacity Market Revenues
- Weatherization Assistance Program (WAP)
- Federal SEP or EECBG
- Other

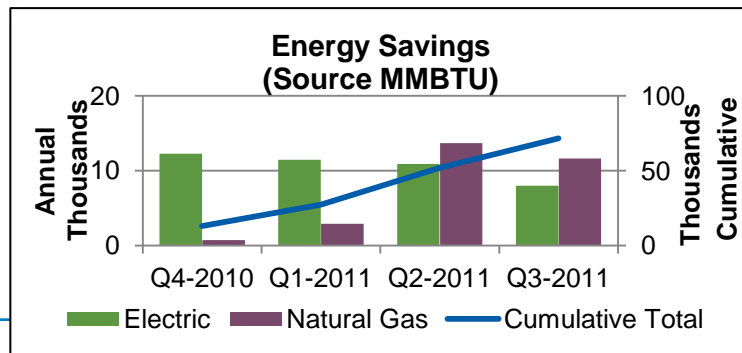
REED has definitions for funding source.

Funding source may not be necessary for categorizing programs for our purpose.

For Discussion: Outcome Metrics & Costs

Progress Outcome Metrics

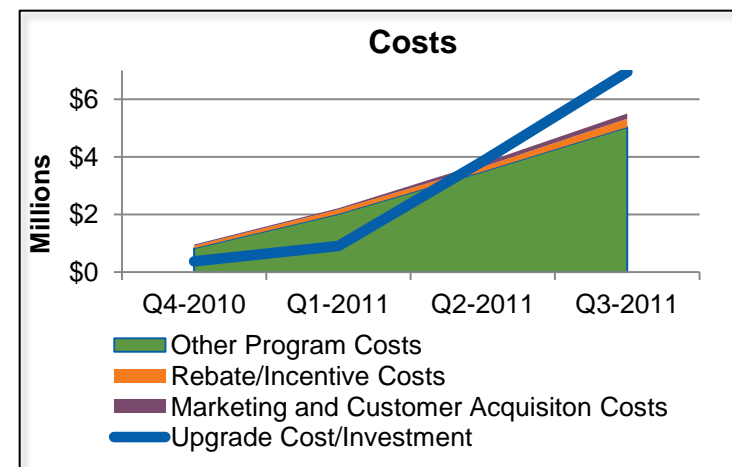
- Number of Participants
- Conversion Rate
- Annual Energy Savings
- Lifetime Energy Savings
- Annual Energy Cost Savings
- Upgrade Invoiced Cost (Total and Mean)
- Number of Loans
- Loaned Amount (Total and Mean)
- Active Participating Contractors
- Jobs



Program Expenditures

- Customer Rebates/Incentives
- Performance Incentive Costs
- Marketing and Outreach
- Program Administration
- Research and Evaluation

REED has definitions we could use.



What is Meaningful to Measure?

- Audit-to-upgrade and non-participant-to-participant are two types of conversion rates, but may not always be measuring the same thing.
 - Some programs only track upgrades completed (and require an audit) so you expect reporting to show a 100% conversion rate.
 - Some programs don't require an audit (or they are not reported consistently) so you expect a conversion rate of > 100%.
- Need to consistently define and measure the target audience and the participant based on the program type

Other Measurement Issues

- If all audits are reported, it is not possible to capture at one point in time the total number that will lead to an upgrade. What is a reasonable time lag (3 or 6 months?) to expect a decision to upgrade?

Energy Savings: Cautions/Questions

Energy Cost Savings

- Good to communicate impact, but rate differences.
 - Could look at program cost vs estimated lifetime cost savings

Annual Energy Savings

ENERGY TYPE	GROSS ENERGY SAVINGS	NET ENERGY SAVINGS	UNITS
Electricity			kWh, MWh or MMBTU
Natural Gas			Therms, CCF or MMBTU
Other			MMBTU

- Doesn't show full impact (over lifetime), but relatively easy to collect.
- Need to document how savings were estimated or measured because there can be a wide difference (deemed savings vs modeled vs bills).
- Do we provide estimated gross energy savings only or also options for adjusted gross (what can be reliably measured) and net energy savings (based on what is attributable to program)?

Lifetime Energy Savings

- Shows impact over lifetime, but more difficult to collect and compile
- Need to provide weighted average measure life
 - Could follow REED Guidelines for calculation

Program Costs: Cautions/Questions

- Marketing \$ Spent /Participant
 - REED Guide combines Marketing and Administration costs because most programs couldn't easily break it out.
 - Valuable for programs to track, but may be difficult to obtain.
- Levelized Cost and Lifetime Cost of Saved Energy
 - Levelized Cost of Saved Energy captures the cost of efficiency as a resource compared to supply-side resources.
 - Need to agree on discount rate to use.
 - Lifetime Cost is easier, but doesn't discount costs to a net present value
 - Could follow REED Guidelines
- What frequency is most useful for benchmarking progress over time?
 - Monthly, Quarterly or Annually?



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Thank you for participating today