



Assessing Costs & Results for Home Upgrade Programs: Follow the Money!

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Agenda

1. Introduction to Home Upgrade Program Accelerator
2. Follow the Money!
 - Program Administrator's Dilemma
 - Categorizing Costs & Program Components
 - Improving Impact
 - Strategy: Improve Effectiveness of Customer Acquisition
 - Strategy: Increase Energy Savings per Upgrade
3. Questions

What is a Better Buildings Accelerator?

- Collaborative peer-to-peer networks designed to facilitate learning and leadership opportunities that result in new strategies and practices in clean energy development.
- Focus on partner-identified areas that aim to overcome persistent barriers.



ISSUE SPECIFIC



TIME BOUND

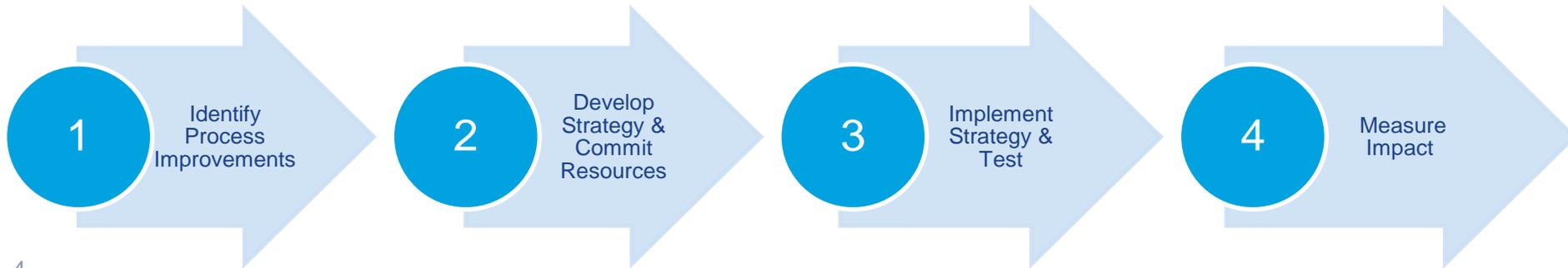
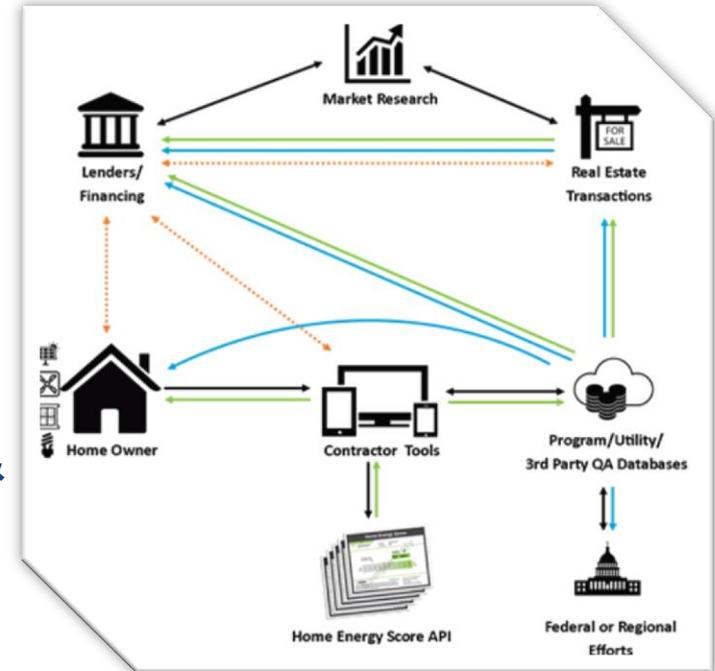


RESULTS-DRIVEN

Home Upgrade Program Accelerator

Objective: Reduce the administrative burden and cost of programs by improving processes to:

- ✓ Manage and track home energy upgrades
- ✓ Review the quality of work
- ✓ Streamline data collection, management, & transfer (e.g., BEDES, HPXML)



Not All Programs are the Same

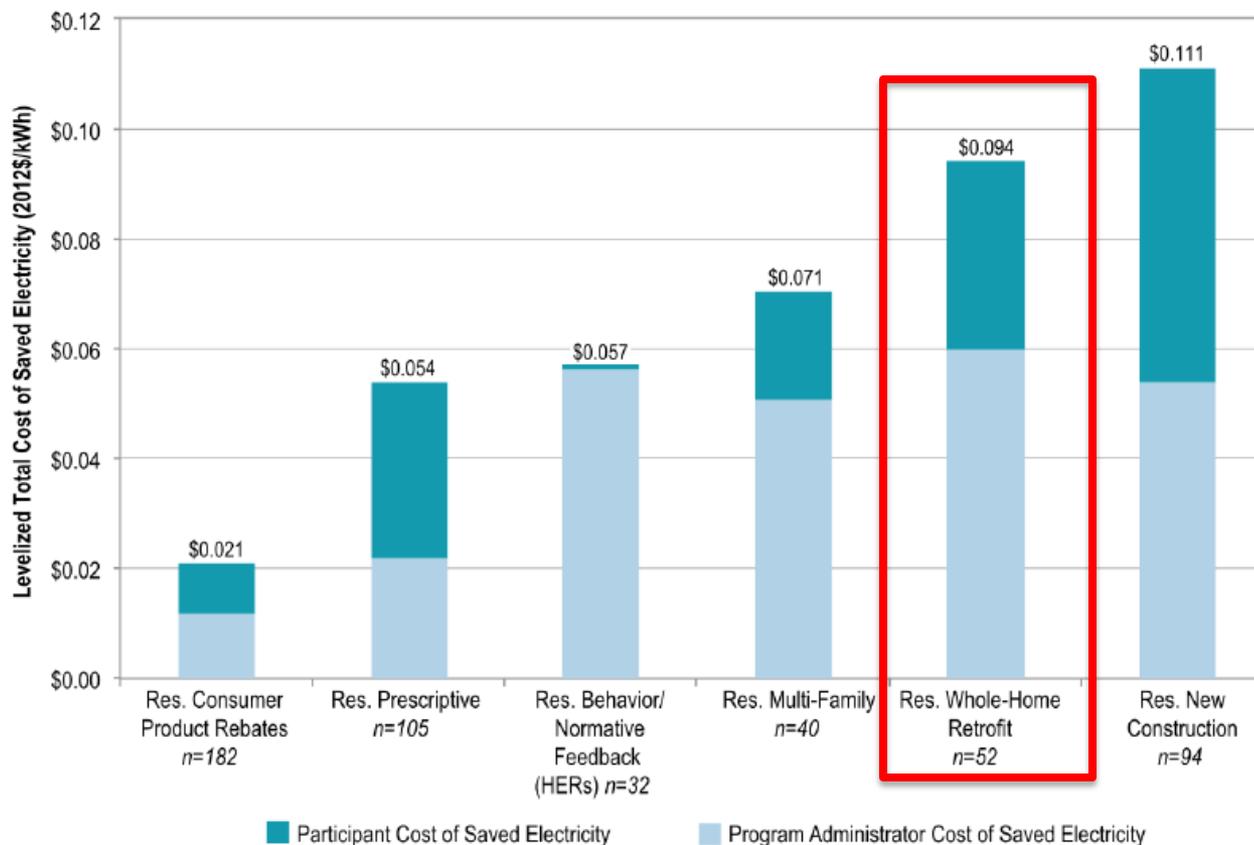


Figure 5. Total cost of saved electricity for various types of residential programs. The total cost consists of program administrator and participant costs.

The Total Cost of Saving Electricity through Utility Customer-Funded Energy Efficiency Programs:

Estimates at the National, State, Sector and Program Level, 2015, Ian M. Hoffman, Gregory Rybka, Greg Leventis, Charles A. Goldman, Lisa Schwartz, Megan Billingsley, and Steven Schiller (<https://emp.lbl.gov/sites/all/files/total-cost-of-saved-energy.pdf>)

Home Upgrade Programs still have some room for IMPROVEMENT



What are good metrics to assess program costs so you can focus investment to achieve more?

Resources for Programs

Residential Program Solution Center

A living repository of lessons learned, resources, and knowledge from program administrators and industry experts across the country.



Better Buildings Residential Network

Connects energy efficiency programs and partners to share best practices and learn from one another to increase the number of homes that are energy efficient.



Follow the Money!

ASSESSING COSTS & RESULTS FOR HOME UPGRADE
PROGRAMS

POLL # 1: Who is in the room?

Which of the following best describes your experience managing a residential Home Upgrade Program?

- A. New or just getting started
- B. Have worked in a supporting role in one/a few areas of program management
- C. Some experience, limited to a few areas of program management
- D. Experienced, with 5+ years in multiple areas of program management
- E. Other (type in Chat box)

Program Administrator's Dilemma

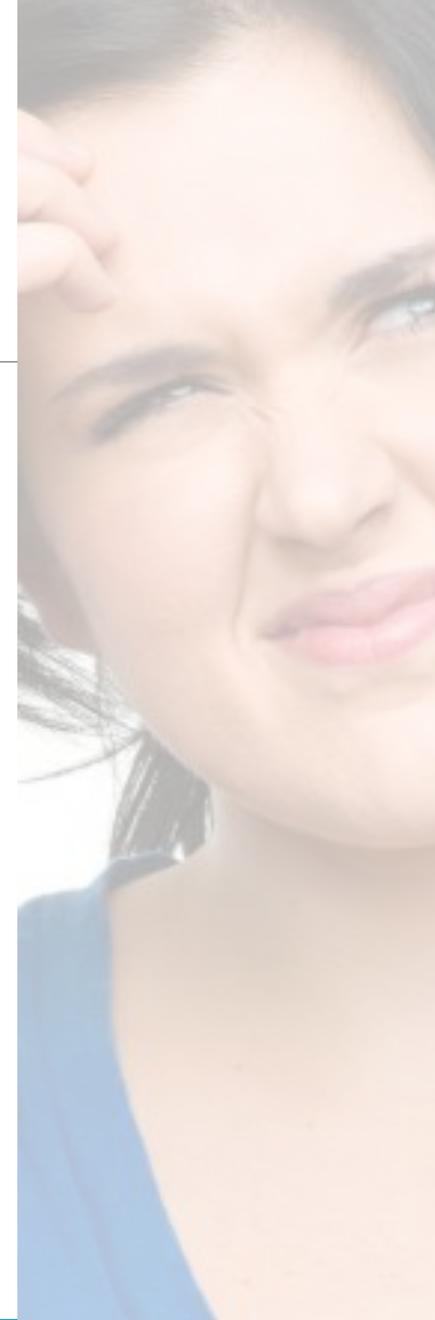
I want my program to **stand out** as the **best value**, when compared to other programs.

My program must **meet specific local requirements** – regulatory reporting, cost effectiveness, and budget.

Things that matter **change**.

- Energy prices go up and down.
- New technologies, marketing approaches, financing mechanisms come along.
- Established program designs lose impact as standards rise, markets change, market segments become saturated.

Comparison to other programs is **difficult**.



How Do You Define Program Success?

- Energy savings – annual, lifetime?
- Improving customer relations?
- Building a trade ally network?
- Meeting regulatory requirements?
- Non-energy benefits? (e.g., reduce air pollution, more local jobs, ratepayer equity, reaching underserved communities, a favorable load curve or demand responsive customer base)
- And many measures of cost:
 - Total resource cost?
 - Ratepayer cost?
 - Customer cost?



Start with Total Program Cost per Lifetime Energy Savings (TP\$/LES)

1. Start with current estimates and reporting
2. Improve quality of measurement & uniformity over time
3. Use deeper dives to identify areas of superior or substandard performance



Is TP\$/LES Worth the Trouble?

Four advantages

- Useful to identify where you're spending program dollars
- Relatively simple to calculate and track
- Applicable across program designs and jurisdictions
- Facilitates deeper dives that find areas for improvement

We can see its limits

- Diagnostic, not prescriptive
- Simplicity of the benchmark means that it won't measure everything, but the approach lends itself to more than one benchmark

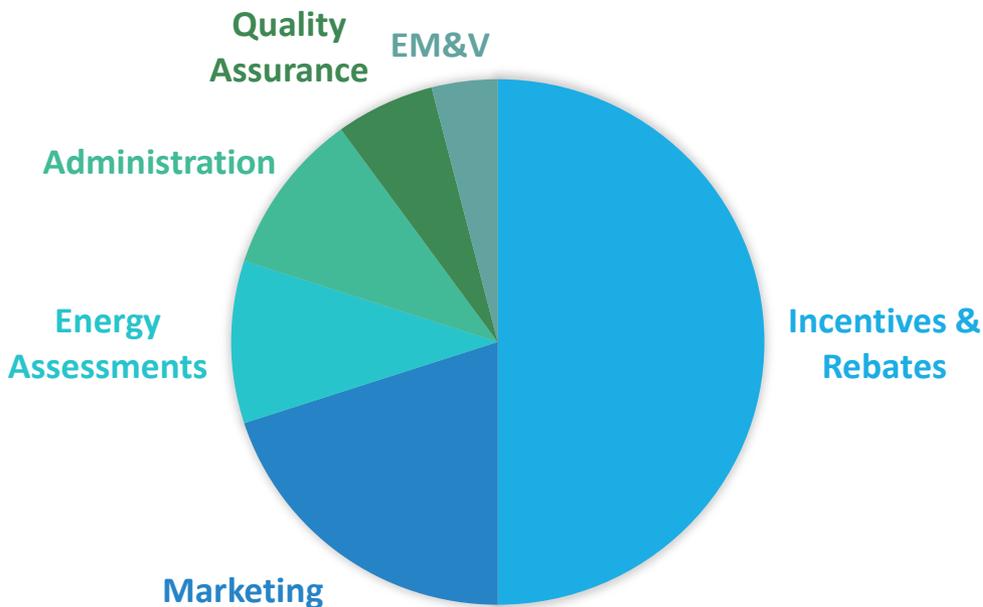


Digging Deeper

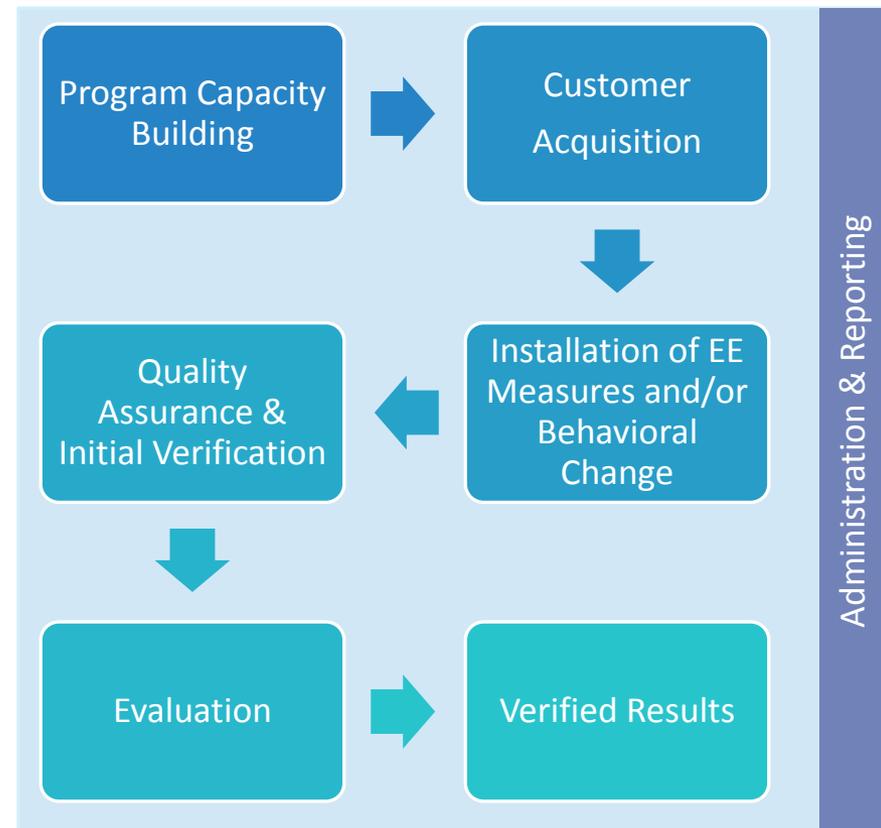
- The TP\$/LES calculation is an overall program calculation
- It looks at the final outcome of the year's work, not what causes the results, or what to learn from or improve
- To figure out where to look for improvements, you need to dig into the details about your program

Categorizing Costs

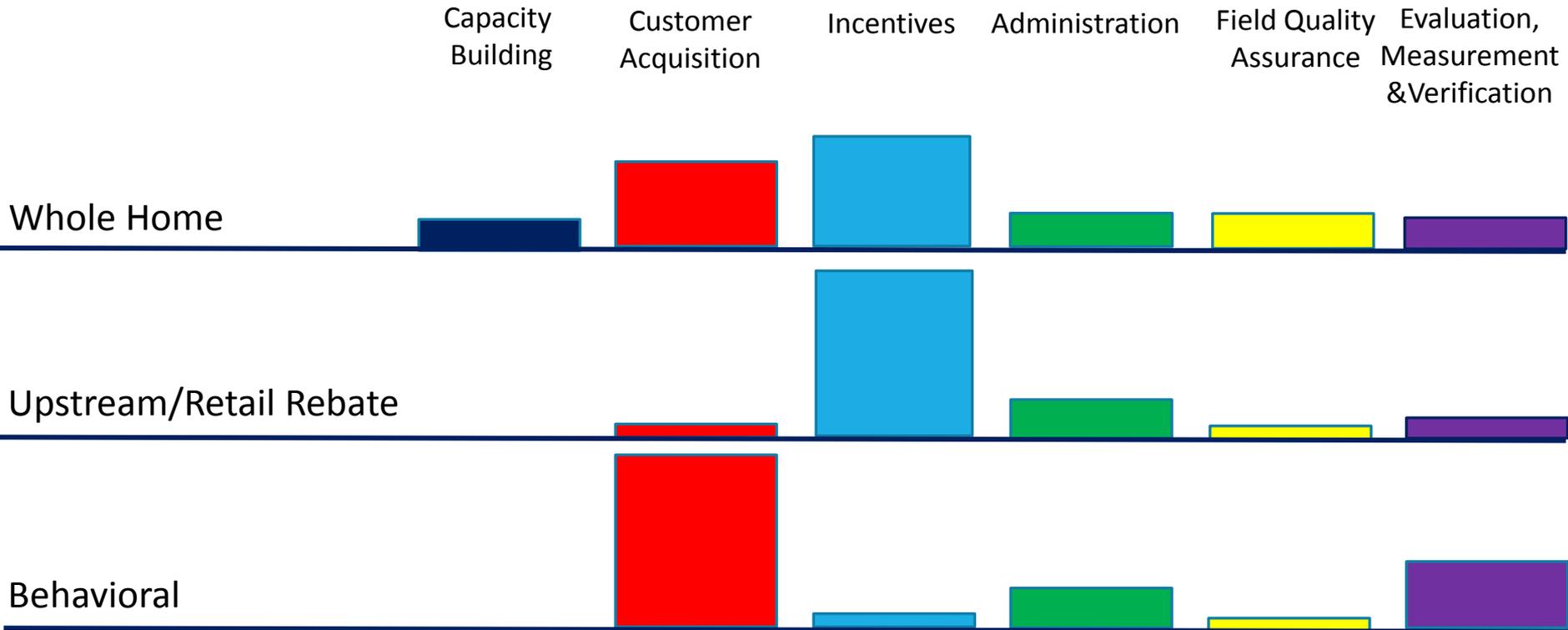
BY BILLING CATEGORY



BY PROGRAM COMPONENT



Program Design Comparison



Illustrative Examples

What's on Your Program Dashboard?



Orange cells - User Inputs			Gray cells - calculated					
SIMPLE ILLUSTRATIVE EXAMPLE OF PROGRAM COSTS AND OUTPUTS								
Program Administrator Cost/Lifetime kWh Saved	\$ 0.05	Goal	<table border="1"> <tr> <td colspan="2">Cost/kWh</td> </tr> <tr> <td>\$</td> <td>0.08</td> </tr> </table>		Cost/kWh		\$	0.08
Cost/kWh								
\$	0.08							
Total Annual Program Administrator Cost	\$ 2,000,000							
Cost Sub Categories			Cost/kWh					
Capacity Building	7%	\$ 140,000	\$	0.005				
Customer Acquisition	25%	\$ 500,000	\$	0.019				
Incentives	50%	\$ 1,000,000	\$	0.038				
Administration	8%	\$ 160,000	\$	0.006				
Quality Management - Field Q&A	6%	\$ 120,000	\$	0.005				
Evaluation, Measurement & Verification	4%	\$ 80,000	\$	0.003				
			Total kWh Saved					
Estimated Annual kWh Saved/Customer	1,000		2,000,000					
Weighted Average Electric Measure Life (years)	13							
Customers	2,000							

Program Components Defined

Capacity Building

The program design phase and launch period where program capacity is built, program partners are recruited and trained, and related activities occur

- Set out the path from acquisition through upgrade and EM&V
- Lay out the roles that various program participants will play
- Crucially, set the program standards for quality
- Training partners and staff on program quality standards is the foundation of quality assurance
- Capacity development costs distort the apparent cost effectiveness of the first months or year of a program
- Program capacity is continuously rebuilt and occurs, on a smaller scale, with every major change in program design or expansion of geographic reach.

Program Components Defined (continued)

Customer Acquisition

Process of identifying & convincing a customer (i.e., individual, homeowner, tenant, landlord, business owner or manager) to participate in an upgrade project that will result in energy savings.

- Customer acquisition ends when a customer agrees to significant savings -- not the audit, but the contract for work (in the whole house context)
- Returning to past customers can lower acquisition costs. Repeat customers are cheaper than new customers

Incentives/Rebates

Any program expenditure that pays for an energy saving measure/service, including installation costs.

- Usually zero for “pure” behavioral programs
- Usually zero for a PACE program unless public funds are used to fund the PACE loans
- Includes any buy-down of a loan product
- Includes the cost of administering the incentive/rebate process, i.e., costs of administration that are variable with customer adoption of EEMs

Program Components Defined (continued)

Administration

Costs of administration of programs that occurs irrespective of spending on customer acquisition or on incentives/rebates -- therefore does not include marketing, customer service around acquisition or incentives

- Includes the costs of reporting program progress and results to the sponsors and regulators, included “fixed costs”

Quality Assurance

Activities to assure quality installation of products and services

- Includes the commonly understood QA activities such as on site inspections to ensure that products/services were actually delivered
- Includes establishing product and installation standards designed to ensure savings results

Evaluation, Measurement & Verification

Costs for independent assessment studies aimed at determining the effects of a program and documenting program performance, program-induced changes in energy efficiency markets, levels of demand or energy savings, or program cost-effectiveness typically required by regulation.

Strategic Questions to Assess a Program

1. Can you reduce cost in major cost centers and maintain output?
2. Can you streamline the process to achieve marginal or major savings?
3. Can you redesign the program to achieve more savings per customer?
4. Can you redesign the program so that it is beneficial for individual customers or partners to pick up more of the cost?
5. Can you attract more customers while maintaining savings per customer?



To Improve Program Cost Effectiveness, Follow The Money



Identify major cost centers first. Major improvements in program effectiveness and efficiency may be possible there.

- **Customer acquisition, capacity building, and incentives** are usually priority areas for major improvements in program effectiveness and efficiency.
- DON'T ignore improvements in **administration & quality assurance**.

Assessing my cost

Customer Acquisition & Incentives = 75%

Capacity Building, Admin, QA, & EM&V = 25%

Orange cells - User Inputs

Gray cells - calculated

SIMPLE ILLUSTRATIVE EXAMPLE OF PROGRAM COSTS AND OUTPUTS

Program Administrator Cost/Lifetime kWh Saved	\$ 0.05	Goal	✘ \$ 0.08
Total Annual Program Administrator Cost	\$ 2,000,000		

Cost Sub Categories

Cost/kWh

Cost Sub Categories			Cost/kWh
Capacity Building	7%	\$ 140,000	\$ 0.005
Customer Acquisition	25%	\$ 500,000	\$ 0.019
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Total kWh Saved

Estimated Annual kWh Saved/Customer	1,000	2,000,000
Weighted Average Electric Measure Life (years)	13	
Customers	2,000	

If my program TP\$/LES (cost/kWh) is ~8 cents and I want to get down to 5 cents, how do I do it?

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SIMPLE ILLUSTRATIVE EXAMPLE OF PROGRAM COSTS AND OUTPUTS

Program Administrator Cost/Lifetime kWh Saved	\$ 0.05	Goal
Total Annual Program Administrator Cost	\$ 2,000,000	

Cost/kWh	
\$	0.08

Cost Sub Categories

Cost/kWh

Category	Percentage	Amount	Cost/kWh
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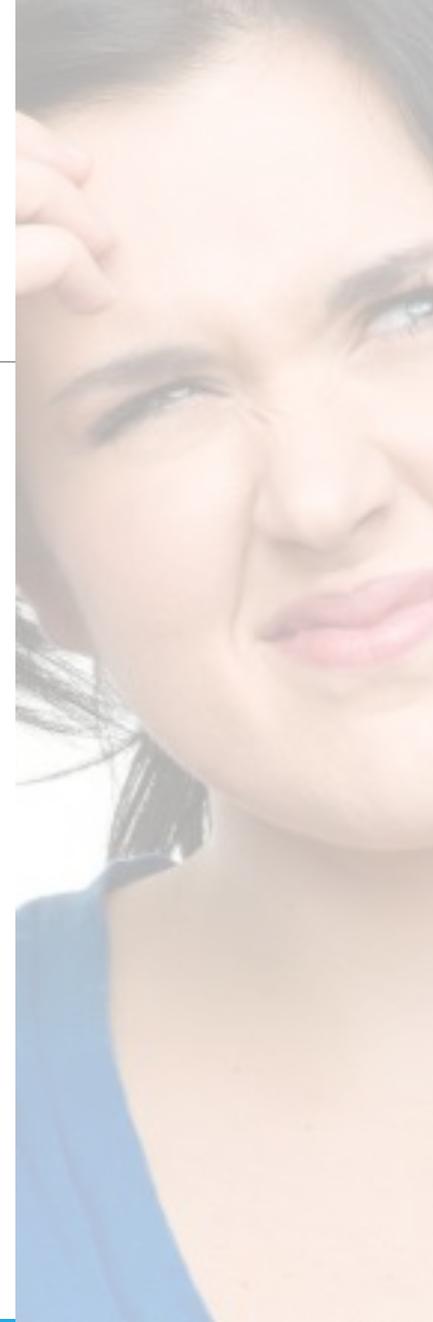
Total kWh Saved	
	2,000,000

Estimated Annual kWh Saved/Customer	1,000
Weighted Average Electric Measure Life (years)	13
Customers	2,000

POLL #2: Many Choices

If my program TP\$/LES (cost/kWh) is ~8 cents and I want to get down to 5 cents, how do I do it? How do I choose?

- A. Offer less incentive per customer
- B. Increase incentives to encourage measures that achieve more energy savings
- C. Offer contractors sales and technical training to help them achieve more energy savings per customer
- D. Spend more money on customer acquisition & marketing
- E. Change marketing strategy to get more customers at the same cost
- F. Redesign program to make it easier and more streamlined for contractors and customers
- G. Develop a long-term customer engagement strategy to get more energy savings from each customer over time



Improving Impact is the Goal

Most attempts to improve cost effectiveness start by looking for places to cut expenses.

This is a mistake.

The goal is to improve impact and cost effectiveness.

- Cutting expenses is one tool
- Better program design and better marketing can have greater impact
- Cutting the wrong expenses can easily reduce program cost effectiveness
 - If your program primarily markets the incentives, cutting incentives can reduce savings per ratepayer dollar
 - If reduced administrative spending increases the time delay for incentive payments, your cost saving can reduce contractor & participant enthusiasm for the program, reducing participation and leaving you worse off than when you started



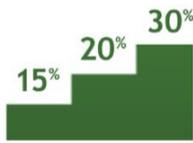
In this example, incentives are the biggest cost.
 What are my options for improving effectiveness?

Orange cells - User Inputs			Gray cells - calculated	
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				Total kWh Saved
Estimated Annual kWh Saved/Customer	1,000			2,000,000
Weighted Average Electric Measure Life (years)	13			
Customers	2,000			

Incentives – Design to Promote Program Success

- Structure incentives to promote participation and achieve program goals (e.g., encourage greater depth of savings, increase the sense of urgency for customers)
- Cost effectiveness calculations set a limit to program costs and incentive costs
- Cost effectiveness calculations do **not** give you incentive design

2 ways to save!



INSTANT REBATES
Our 3 rebate tiers are based on how much more efficient your home will be when it's complete.

NO MONEY DOWN

FINANCING
Our lender partners offer low APR loan options for every region.

Click a region in the chart below to find out exactly how much our program can save you.

Source: [Spotlight on Portland, Oregon: Use Incentives to Get Attention and Encourage Deep Savings](#), 2012.

Incentives – Design Example

Goal:

- Achieve maximum savings over time in an HVAC replacement program

Qualification criteria:

- Verification of proper charge and air flow required for any incentive level

Incentive rates:

- Higher incentive for higher rated efficiency equipment (tiers)

Communications:

- Simple chart (no complex calculation), so contractor can tell the customer what the final price will be at the point of sale

Timing:

- Off season special
 - Contractors have plenty of customers during the beginning of the heating & cooling season.
 - Give a bigger incentive “off season” to boost non-emergency sales and encourage contractor participation.

Customer acquisition is the second biggest cost.

SIMPLE ILLUSTRATIVE EXAMPLE OF PROGRAM COSTS AND OUTPUTS

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		Total kWh Saved			
Estimated Annual kWh Saved/Customer	1,000	2,000,000			
Weighted Average Electric Measure Life (years)	13				
Customers	2,000				

By increasing my customers, for the same cost and average savings per customer, I can increase cost effectiveness.
How do I do that?

Orange cells - User inputs

Gray cells - Calculated

SIMPLE ILLUSTRATIVE EXAMPLE OF PROGRAM COSTS AND OUTPUTS

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Cost/kWh	
✓ \$	0.05

Cost Sub Categories

Cost/kWh

Cost Sub Categories				Cost/kWh
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Customer Acquisition	25%	\$ 500,000	\$	0.012
Incentives	50%	\$ 1,000,000	\$	0.025
Administration	8%	\$ 160,000	\$	0.004
Quality Management - Field Q&A	6%	\$ 120,000	\$	0.003
Evaluation, Measurement & Verification	4%	\$ 80,000	\$	0.002

Total kWh Saved	
	3,100,000

Estimated Annual kWh Saved/Customer	1,000
Weighted Average Electric Measure Life (years)	13

Customers	3,100
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Strategy: Improve Effectiveness of Customer Acquisition

Improve Customer Acquisition

The goal of marketing is to find customers who:

1. Can benefit from program offerings
2. Are willing to buy or persuadable

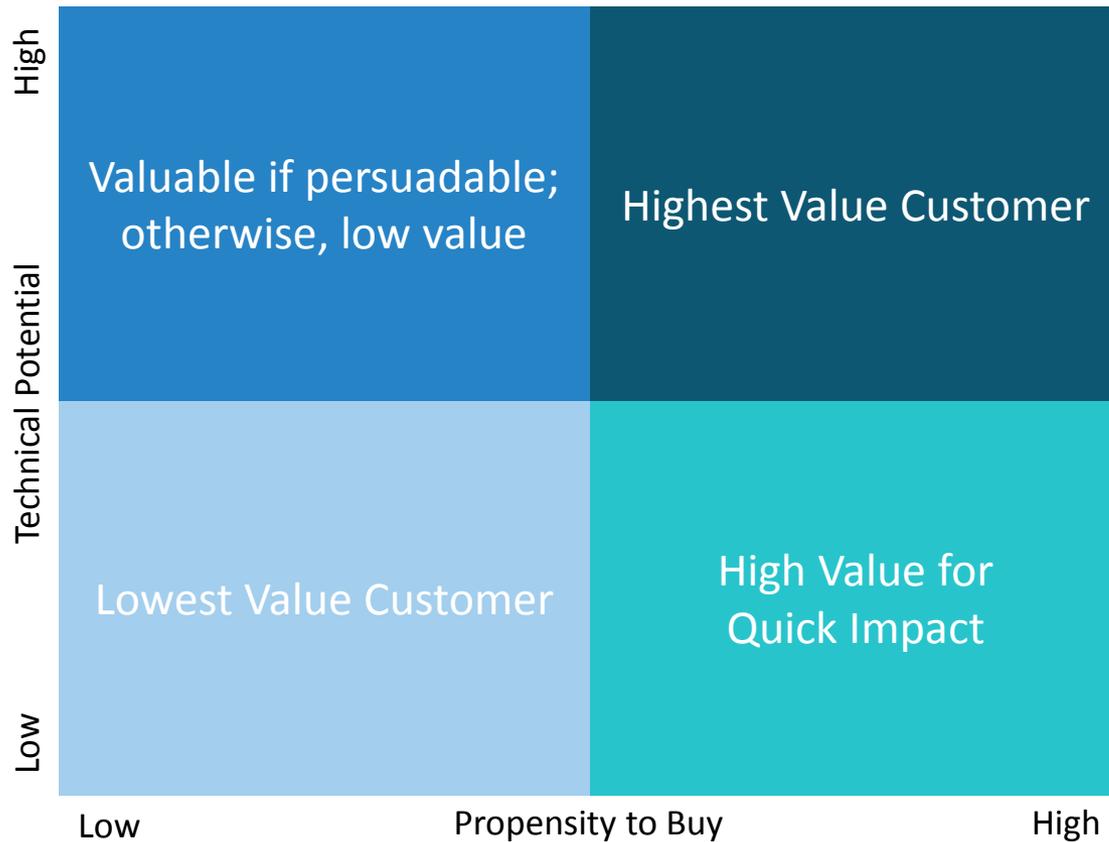
Effective marketing finds these customers.

Efficient marketing separates these prime customers from those who either cannot benefit, or are not interested.

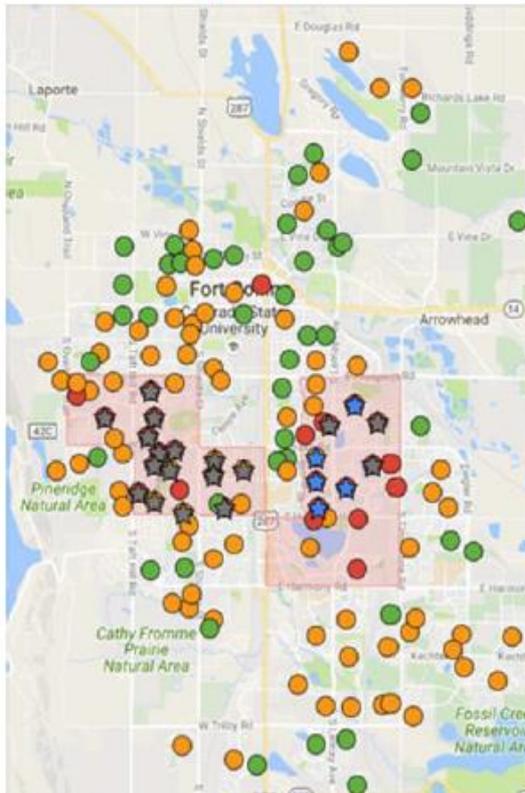
Cost-effective marketing does effective segmentation at a low cost.



Customer Value Matrix



Fort Collins' Mapping To Target Neighborhoods



Efficiency Works Pilot Results*

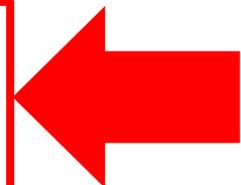
70%
GREATER THERM
SAVINGS PER
HOME



50%
GREATER kWh
SAVINGS
PER HOME



2X
AS MANY
CUSTOMERS
ENROLLED



64% OF
PROJECTS
USED ON-BILL
FINANCING



44%
CONVERSION
RATE TO A
PACKAGE



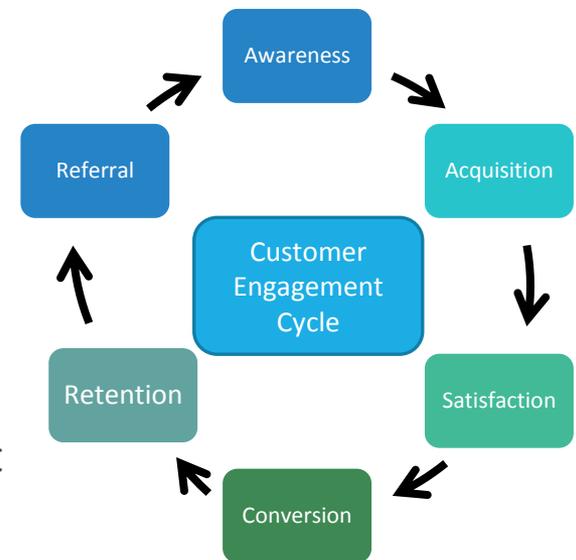
Long-term Customer Engagement

The promise of tomorrow

- Return customers are an obvious means of raising program cost effectiveness.
- Look at all efforts to build customer loyalty and brand identity.

EE industry has been pursuing this ideal for years, with poor results

- Customers generally see purchases as one-off events, not part of an ongoing energy efficiency improvement plan
- Contractors are geared to one product or service group
- Retail partners have a range of customer loyalty programs and a wide range of products



I could try to get more energy savings per home.

SIMPLE ILLUSTRATIVE EXAMPLE OF PROGRAM COSTS AND OUTPUTS

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Cost/kWh	
✗ \$	0.08

Cost Sub Categories

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Incentives	50%	\$ 1,000,000
Administration	8%	\$ 160,000
Quality Management - Field Q&A	6%	\$ 120,000
Evaluation, Measurement & Verification	4%	\$ 80,000

Cost/kWh	
\$	0.005
\$	0.019
\$	0.038
\$	0.006
\$	0.005
\$	0.003

Total kWh Saved	
	2,000,000

Estimated Annual kWh Saved/Customer	1,000
Weighted Average Electric Measure Life (years)	13
Customers	2,000

It seems that contractors play an important role in achieving more savings per customer.
Which program cost category will I need to focus on?

SIMPLE ILLUSTRATIVE EXAMPLE OF PROGRAM COSTS AND OUTPUTS

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Quality Management - Field Q&A	6%	\$ 120,000	\$ 0.003
Evaluation, Measurement & Verification	4%	\$ 80,000	\$ 0.002

Total kWh Saved
3,200,000

Estimated Annual kWh Saved/Customer	1,600
Weighted Average Electric Measure Life (years)	13
Customers	2,000

Strategy:
Increase Energy
Savings per Upgrade

Increase Savings per Site Visit

- **Site visits are expensive.** Between marketing, scheduling, travel and staff time, they are often \$300+ before any measures are installed or contracts signed.
- **Maximize savings per visit.** For low cost materials, the cost of materials and installation is less than the sunk cost of the visit itself.
 - More direct install measures
 - More follow-on agreements
 - More enrollment of customers in ongoing savings efforts
- **Assess interest in measures & willingness to buy before the site visit.** Identify hotter leads to prioritize program and contractor resources.
 - Aim for a “near sale” prior to the visit. The site visit purpose is to specify the work and finalize the price. Require the decision maker be present. The sale should nearly be closed before you leave.
 - If you offer financing, encourage the customer to pre-qualify before the energy assessment. This clarifies willingness and ability to buy, as well as the purpose of the assessment.

Contractor Partner Recruiting

Building & maintaining a program's contractor infrastructure is often a major program expense that is not well analyzed.

As with customers, contractor partners vary widely in capacity and interest in promoting and fulfilling the program.

A program improvement process should look at the contractor network and segment contractors based on their contribution to program goals and their "cost of maintenance."



Contractor Value Matrix

Contractor Goals	Low Volume	Growing Volume	High Volume
High Quality	Value Potential	High Value	High Value
Low Quality, Ambitious Management	Value Potential (Offer quality improvement resources)	Value Potential (Offer quality improvement resources/aid, if management committed to quality improvement)	Value Risk (Have clear discussion about role of quality in company business plan. Resources to those committed to quality improvement)
Low Quality, Content Management	Value Risk	Value Risk	Value Risk

Continuity – a Hidden Value

Program design and capacity building costs come in at the beginning. To get a good return on these investment, the program may need to be producing energy savings for at least a few years.

Stopping, restarting, and revising the program creates additional program design and capacity building costs that will hurt the program's cost-effectiveness.



Scale - Another Hidden Value

- Multiple programs operating in silos within an organization often cost more per unit of energy saved.
- Startup, capacity building, duplicative administrative, and reporting costs sap program cost effectiveness.
- Consolidation of programs with good integration allows for cross marketing of different products and services and can provide a basis for ongoing customer engagement, which can reduce marketing costs and maximize incentive impact.



Strategic Questions to Assess a Program

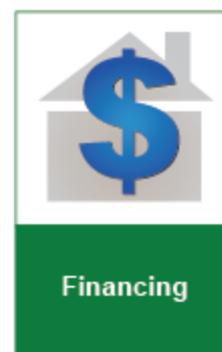
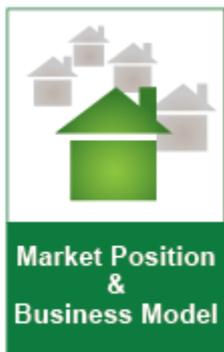
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Residential Program Solution Center

For more ideas on how to improve and refine your program, visit the Residential Program Solution Center.

<https://rpssc.energy.gov/>



Poll #3: Next Steps

What would you find useful as a next step to improve your program?

- A. Deep dive into calculating program costs by program component
- B. Lessons learned on improving customer acquisition effectiveness
- C. Lessons learned on increasing energy savings per upgrade
- D. Strategies for engaging partners more
- E. Other? (type into Chat box)