Energy Efficiency: Benefits and Costs, & Program Performance

Presented to the Energy Policy Review Commission

3 April, 2013

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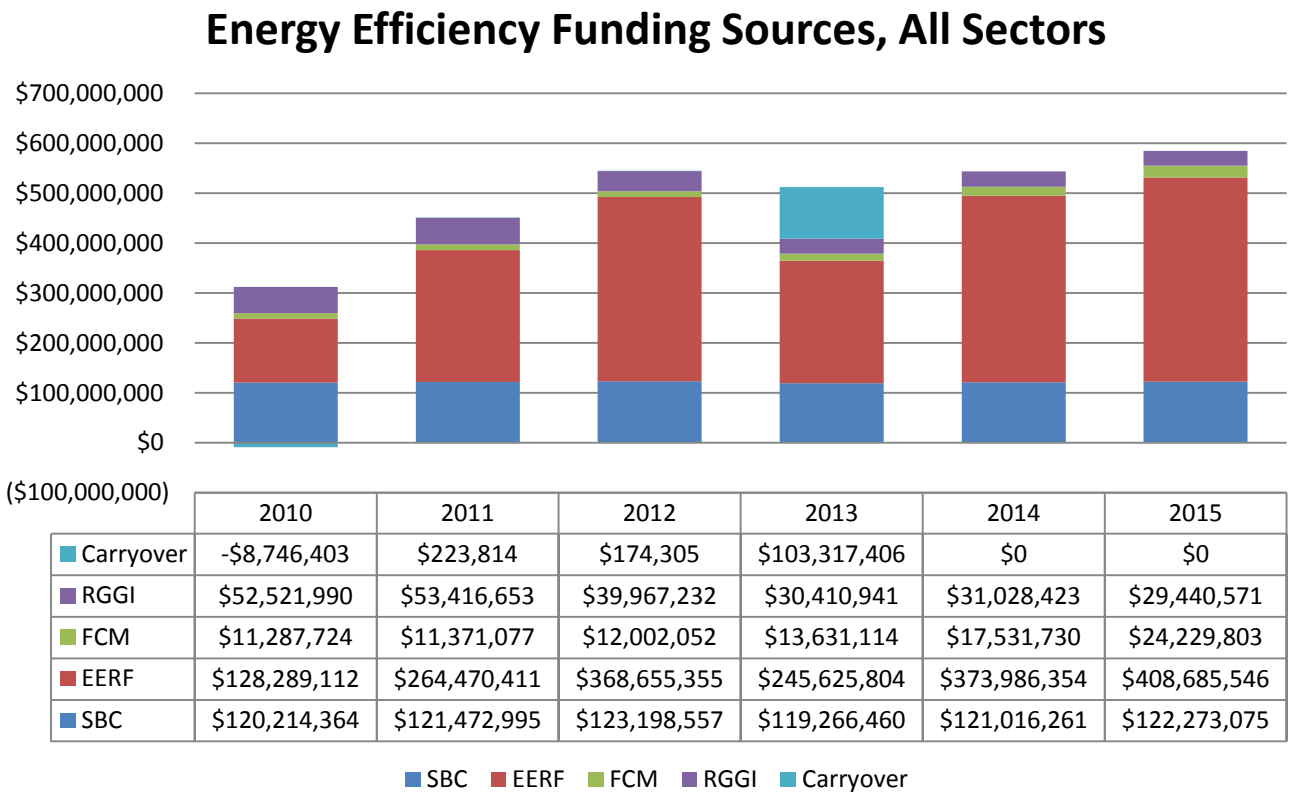
Program Funding

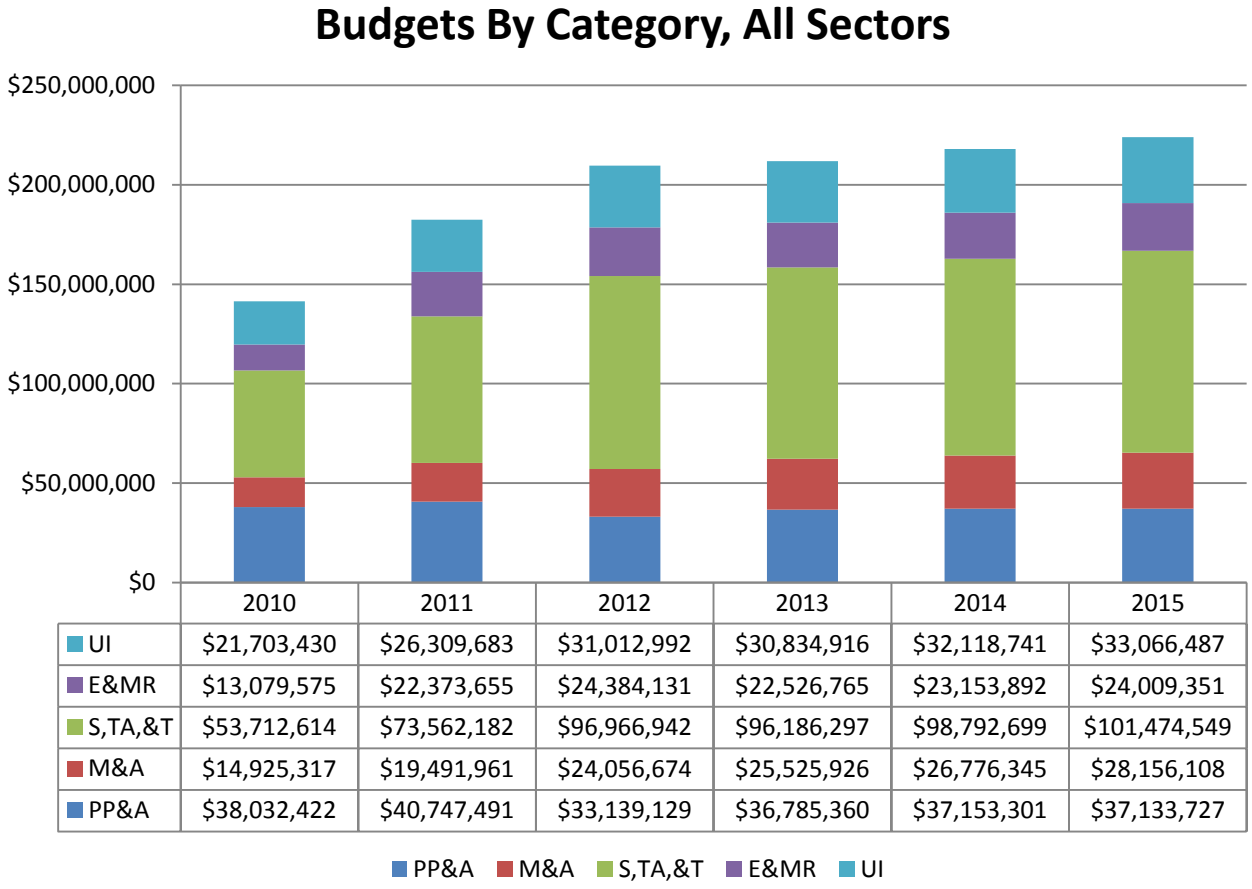


	2010	2011	2012	2013	2014	2015
Carryover	-$8,746,403	$223,814	$174,305	$103,317,406	$0	$0
RGGI	$52,521,990	$53,416,653	$39,967,232	$30,410,941	$31,028,423	$29,440,571
FCM	$11,287,724	$11,371,077	$12,002,052	$13,631,114	$17,531,730	$24,229,803
EERF	$128,289,112	$264,470,411	$368,655,355	$245,625,804	$373,986,354	$408,685,546
SBC	$120,214,364	$121,472,995	$123,198,557	$119,266,460	$121,016,261	$122,273,075

- 93% growth 2010 to 2015, from $304M to $585M.
- 2013 carryover due to under-spending in C&I sector.

Source: MTMs and Three Year Plans 2010 - 2015

Program Budgets

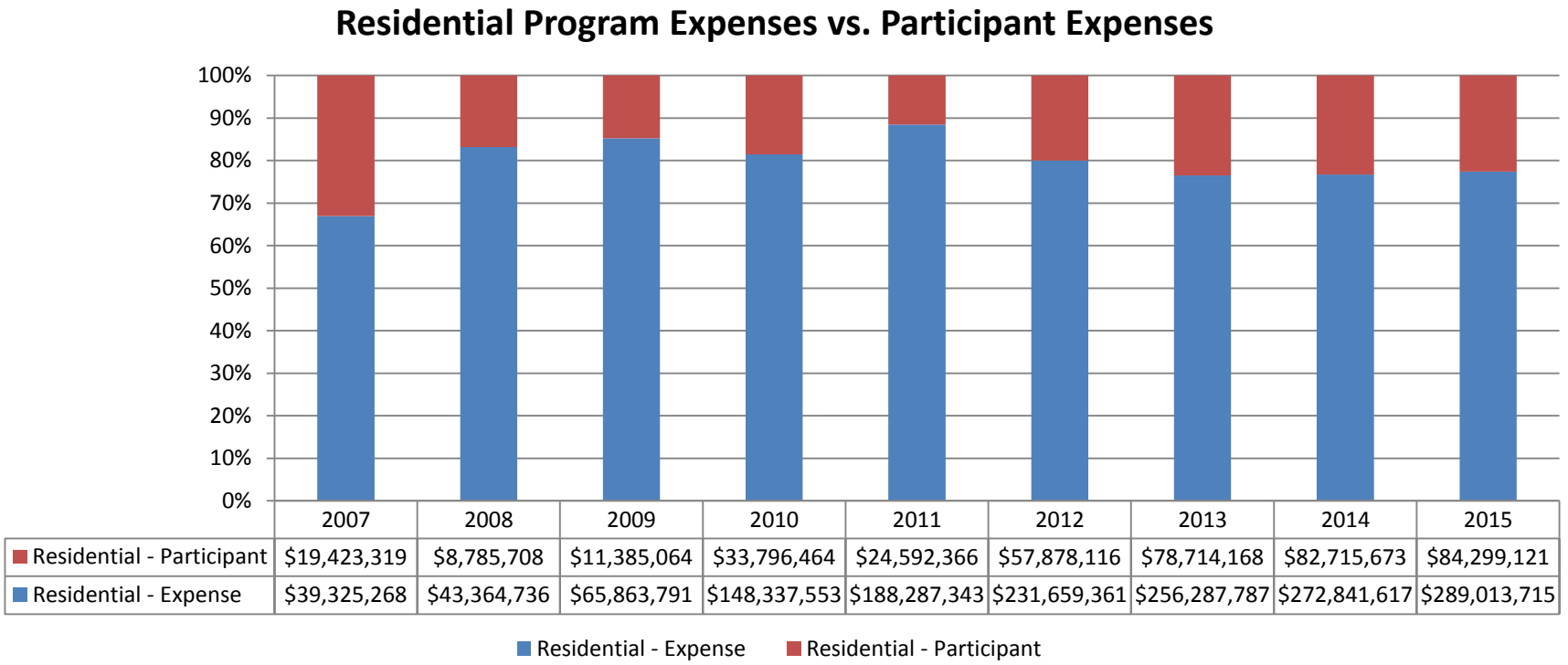


	2010	2011	2012	2013	2014	2015
UI	$21,703,430	$26,309,683	$31,012,992	$30,834,916	$32,118,741	$33,066,487
E&MR	$13,079,575	$22,373,655	$24,384,131	$22,526,765	$23,153,892	$24,009,351
S,TA,&T	$53,712,614	$73,562,182	$96,966,942	$96,186,297	$98,792,699	$101,474,549
M&A	$14,925,317	$19,491,961	$24,056,674	$25,525,926	$26,776,345	$28,156,108
PP&A	$38,032,422	$40,747,491	$33,139,129	$36,785,360	$37,153,301	$37,133,727

- Excludes participant incentives.
- Budget growth of 58% from 2010 to 2015.
- 189% increase in Sales, Technical Assistance, and Training 2010 to 2015.
- 62% of funding being returned to ratepayers in the form of incentives in 2015.

Source: MTMs and Three Year Plans 2010 - 2015

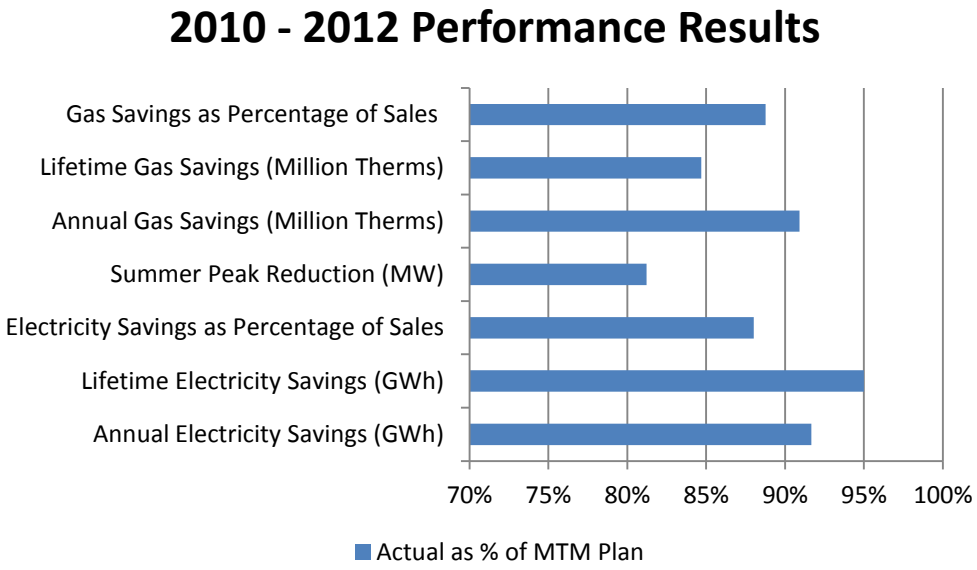
Participant Incentives



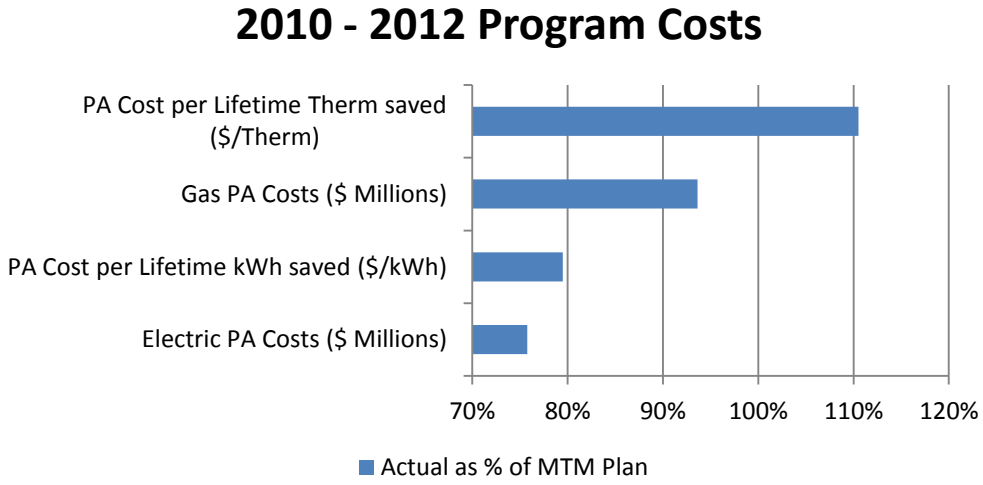
- Residential programs not successfully leveraging participant investment. Essentially a hand-out.
- Free-ridership rate for weatherization estimated by PAs to be 25%.
- No appreciable change in trend forecasted through 2015.

Source: MTMs and Three Year Plans 2010 - 2015

2010 – 2012 Program Results



- Savings goals were missed in every category for both gas and electric programs.
- Missed opportunity – both gas and electric programs under-spent budgets.
- $/therm saved exceeded target by greater than 10%.



Source: Consultant presentation to EEAC, 12 March 2013

HES Performance 2010 & 2011

	2010	2011	Comment
Home Energy Assessments completed	28,842	50,149	Combined 2.8% of the 2.8M housing units in MA
Number of homes having ISMs installed	90%	90%	10% of assessments result in no savings.
Savings attributable to ISMs (MMBTU)	143,091	219,369	74% increase in HEAs, yet just 53% increase in savings
Weatherization projects completed	6,099 (21%)	10,410 (21%)	Average project cost $1,991
Heating systems (oil or propane)	3,586 (12%)	3,097 (6%)	
Water heating systems	1,863 (6%)	1,601 (3%)	
HEAT loans	2,930 (10%)	3,353 (7%)	

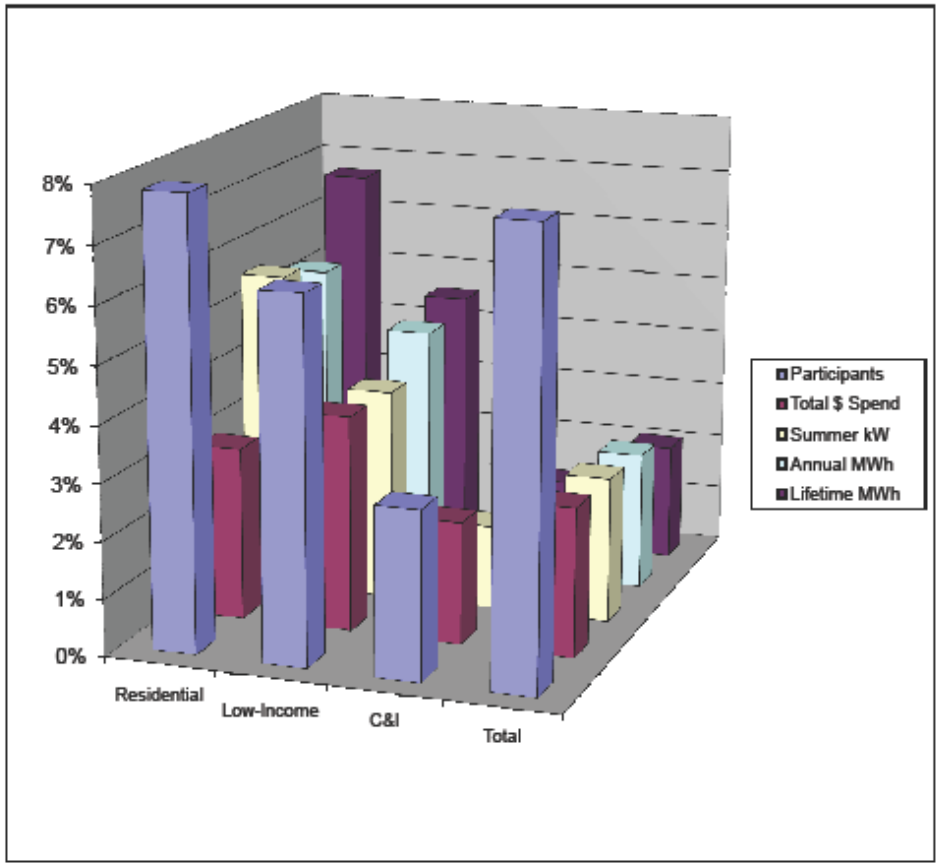
- Results shown are for CSG, the Lead Vendor for both National Grid and NSTAR.
- ISM savings per HEA fell by 12% from 2010 to 2011.
- Low sales conversion rates (21%) for weatherization, and trending lower in all other major savings categories.
- Deep savings not being achieved. Average WX project cost less than $2,000 max rebate eligibility!!

Source: Steve Cowell letter dated January 13, 2012

Inadequate Oversight

Statewide Electric Data Dashboard - As of January 31, 2013 [1,2]										
	Participants		Total $ Spend		Summer kW		Annual MWh		Lifetime MWh	
	YTD	% of Goal	YTD	% of Goal	YTD	% of Goal	YTD	% of Goal	YTD	% of Goal
Residential	169,395	8%	$4,683,441	3%	2,419	6%	17,306	5%	126,755	7%
Low-Income	1,769	6%	$2,054,450	4%	124	4%	1,251	4%	12,028	5%
C&I	486	3%	$5,869,228	2%	1,888	1%	10,421	1%	131,169	1%
Total	171,850	8%	$12,607,119	3%	4,431	3%	29,178	2%	269,953	2%

1. Note all data is preliminary and subject to true-up in quarterly and annual reports.
2. All data reflect actuals through 1/31/2013; presented at March EEAC meeting.



- Report detail is unacceptable considering >$500M annual expenditure, including $37M annual program planning and administration budget.
- Performance of specific programs not evident.
- No visibility into performance metrics, e.g. cost per kWh saved, savings per participant (depth).
- Plan and trends not shown.
- How was the money spent? Where did the savings come from?
- Residential Participant count issue still not resolved after 18 months!

ACEEE Scoring System

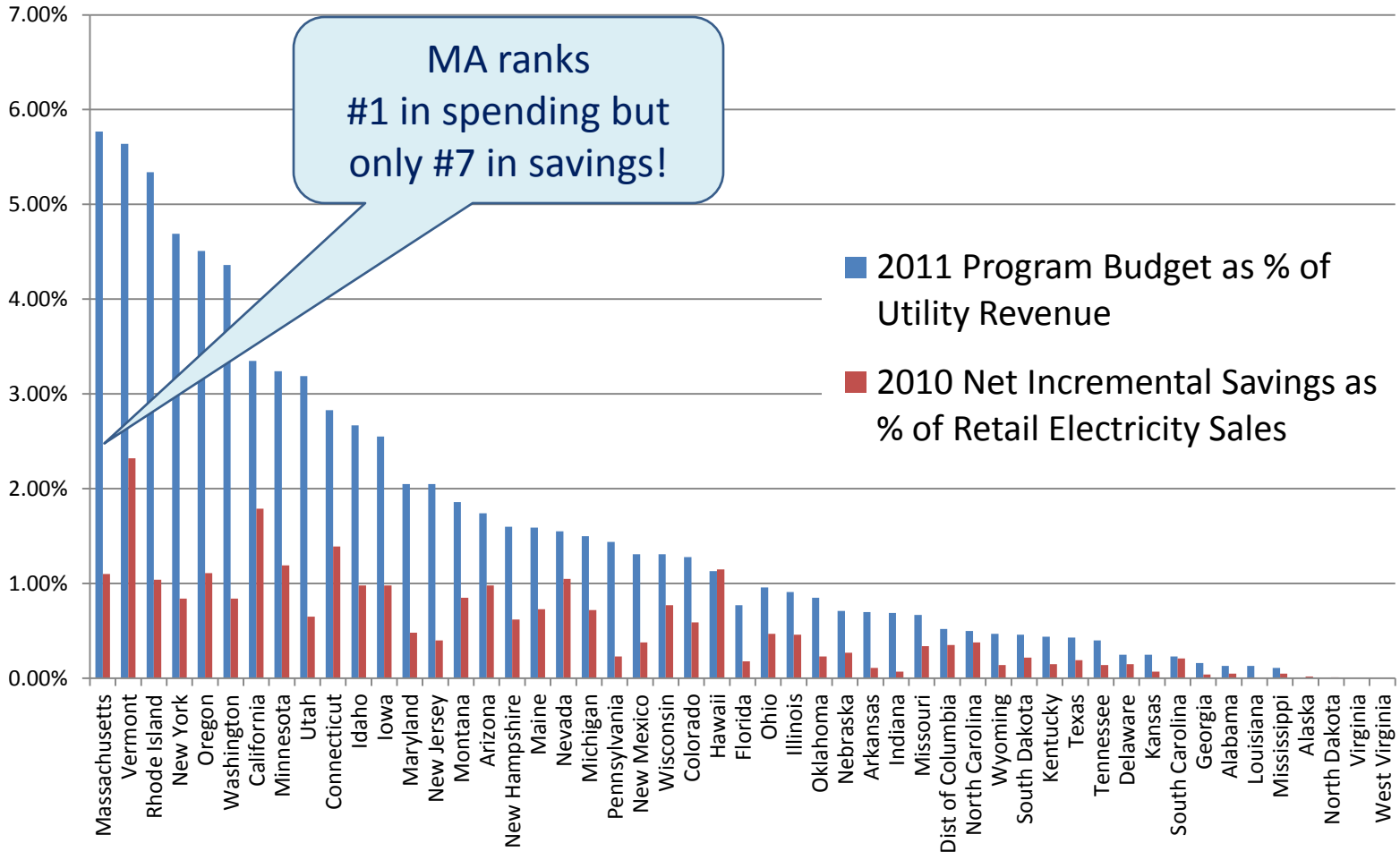
Table 1. Scoring by Policy Category

Policy Category & Subcategory	Maximum Score	% of Total Points
Utility and Public Benefits Programs and Policies	20	40%
Electric Efficiency Program Budgets	*5*	10%
Natural Gas Efficiency Program Budgets	*3*	6%
Annual Savings from Electric Efficiency Programs	*5*	10%
Energy Efficiency Resource Standards (EERS)	*4*	8%
Performance Incentives and Fixed Cost Recovery	*3*	6%
Transportation Policies	9	18%
Greenhouse Gas (GHG) Tailpipe Emissions Standards	*2*	4%
Integration of Transportation and Land Use Planning	*2*	4%
Vehicle Miles Traveled (VMT) Targets	*2*	4%
Transit Funding	*1*	2%
Transit Legislation	*1*	2%
Complete Streets Policies	*0.5*	1%
High-Efficiency Vehicle Consumer Incentives	*0.5*	1%
Building Energy Codes	7	14%
Level of Stringency	*5*	10%
Enforcement/Compliance	*2*	4%
Combined Heat and Power	5	10%
Interconnection Standard	*1*	2%
Treatment under Energy Efficiency Resource Standards (EERS)/Renewable Portfolio Standards (RPS)	*1*	2%
Financial Incentives	*1*	2%
Net Metering Rules	*0.5*	1%
Emissions Treatment	*0.5*	1%
Financing Assistance	*0.5*	1%
Additional Policy Support	*0.5*	1%
State Government Initiatives	7	14%
Financial and Information Incentives	*3*	6%
"Lead by Example" Efforts in State Facilities and Fleets	*2*	4%
Research, Development, and Demonstration (RD&D)	*2*	4%
Appliance and Equipment Efficiency Standards	2	4%
Maximum Total Score	**50**	**100%**

- 74% of total possible points are related to policy issues.
- 16% are linked to energy efficiency program budget amounts.
- 10% are linked to electric program savings results.
- Gas program savings are not included.

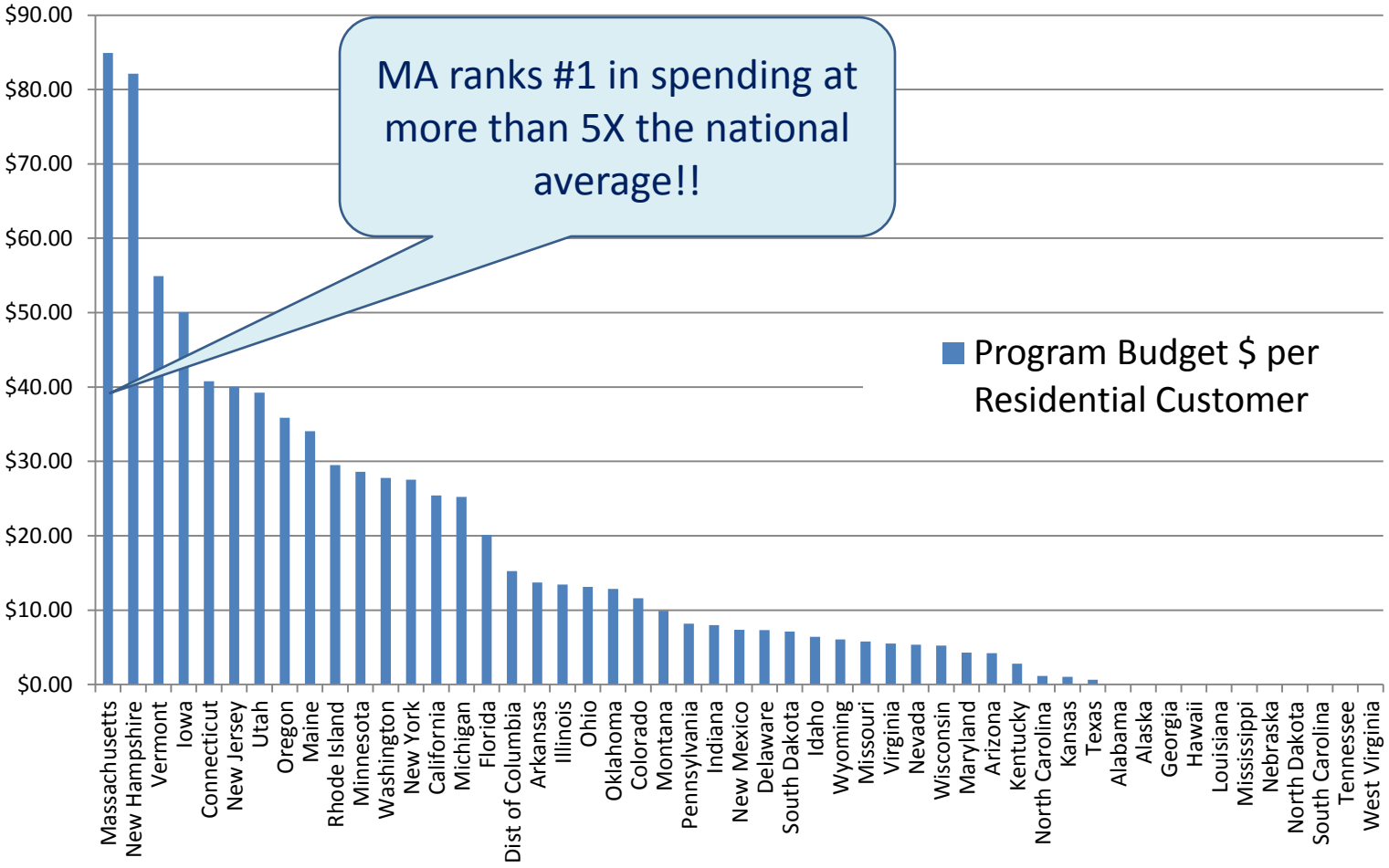
A #1 overall ranking does not imply that Massachusetts utility-sponsored energy efficiency programs are performing at a high level with respect to their cost!!

Comparison of Electricity Efficiency Programs



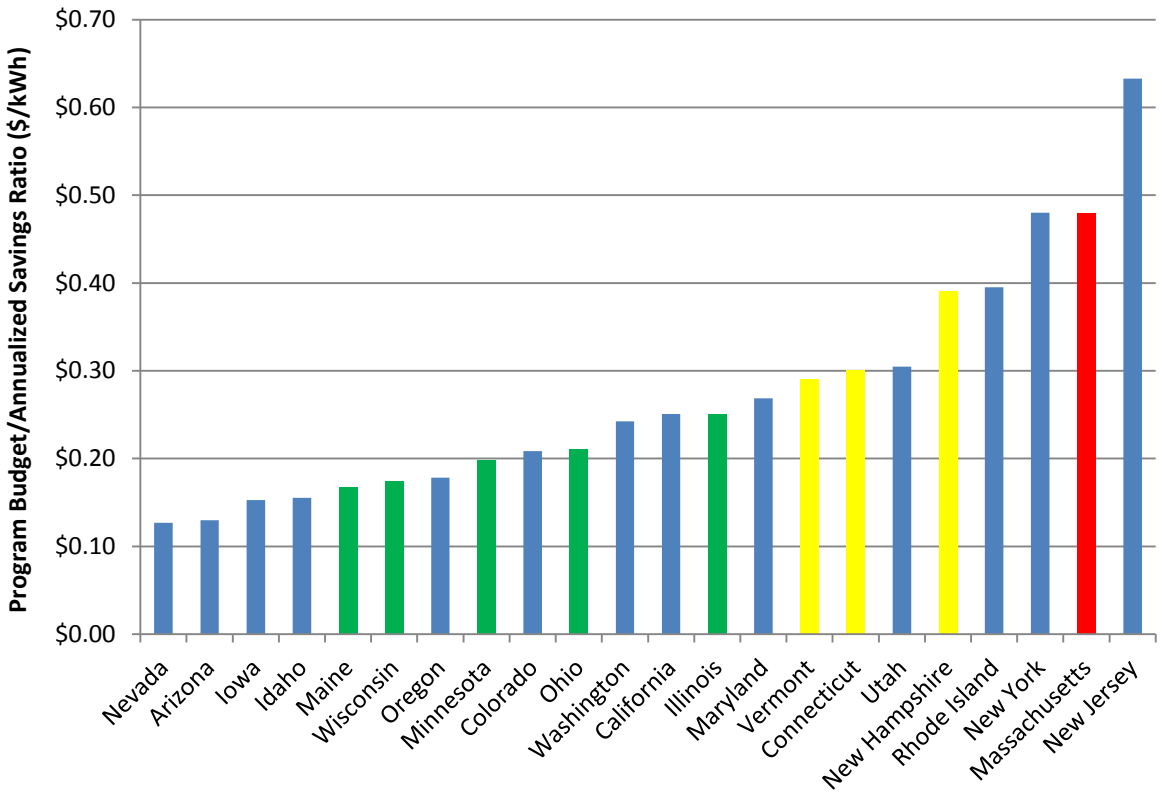
Source: The 2012 State Energy Efficiency Scorecard, ACEEE, October 2012

Comparison of Gas Efficiency Programs



Source: The 2012 State Energy Efficiency Scorecard, ACEEE, October 2012

2010 Performance of Electricity Efficiency Programs Among Key States



- States with electric efficiency program budgets greater than 1% of electricity revenue are shown.
- Green and yellow comparison states have heating dominated climates, zones 5A, 6A, or 7A

Source: The 2012 State Energy Efficiency Scorecard, ACEEE, October 2012

Only Two Ways to Improve

1. Spend less money while achieving the same savings and benefits
   - Eliminate non-value-added activities that have associated costs
   - Streamline efficiency of processes

OR/AND

2. Spend the same money while achieving greater savings and benefits
   - Leverage customer investments better

Green Communities Act mandates minimizing administrative expenses, but utility PAs have not been held accountable to deliver reductions.

Ultimate Objectives

- Consumer Education
  - Drive demand for energy efficiency products and services through permanent changes in consumer attitudes about their value.
- "Prime the Pump"
  - Leverage ratepayer investments in energy efficiency.
  - Foster a highly skilled sustainable industry that does not rely upon program infrastructure and incentives.
- Reap benefits while minimizing burden on ratepayers.

Market transformation vs. permanent subsidy program.

New Strategy Required

- Lighting programs cannot deliver deep savings by themselves.
- Need increased emphasis on and performance of weatherization programs.
  - Separate specialized program
  - Reduced emphasis on investment payback in the sales approach
  - Greater number of highly motivated contractors to reach greater number of customers
  - Cost-effectiveness testing that does not consider participant expenses (i.e. PA cost test)

Concerns with Existing Programs

- Non-compliance with MA laws
- Depth of savings
- High program administrative costs
- Opportunity for all stakeholders
  - Competitive marketplace
  - High quality job creation

HES Program is not in compliance with Massachusetts law

- Massachusetts law requires a building permit for insulation work.
- 90% of MassSave HES program insulation projects being done without a permit.
  - Homeowners at risk.
  - Inspection cost reduction opportunity being missed.
- Program design encourages contractors to violate the law. Contractors have expressed concerns since July 2011. No enforcement by Lead Vendor.
- BBRS alerted August 2012, yet no enforcement action taken. September 2012 request for official interpretation as to whether air sealing is considered an ordinary repair was ignored.
- Simple solutions exist.
- AGO asked to investigate March 2013; awaiting their findings.

Shallow Savings

- Low implementation rates for weatherization, despite substantial incentives.
  - HEA focus is on ISMs, not envelope improvements.
  - No testing performed.
  - Little opportunity for customer education. Over-dependence on payback to drive sales; customers will spend money to solve problems, e.g. comfort, ice dams, mold, etc.
  - Failure to leverage contractor/customer relationship.
- Program “loophole” encourages small retrofits over several years to receive multiple incentives.

Major overhaul of envelope evaluation and improvement services necessary to achieve deeper savings!!

High Administrative Costs

- Increasingly rigorous contractor training and certification requirements, yet:
  - 100% quality control inspection
    - Inconvenience to customer
    - Redundant with local code official inspection
    - Results not even available to customers during contractor selection
  - 100% Lead Vendor review of all HPC work scopes

Random inspection sample (10%) with increasing frequency and disciplinary measures when persistent problems are identified would be much more cost-effective !!

Competition

- Monopolies are generally viewed as harmful to consumers
  - Limit customer choices
  - Negative impact to quality of goods and services
- Open and competitive markets best serve the needs of a diverse group of consumers
- Consumers want and are good at making value decisions
  - Angie's List

Opportunity Lacking for Many

- MassSave weatherization jobs do not meet the standard for “high quality”; workers are almost universally paid low hourly wages, with no medical, retirement, or vacation/sick time benefits.
- Business owners relegated to subcontractors of the Lead Vendor.
- Customers have no choices; “one-size-fits-all”, and “take-it-or-leave-it”

Best Practice Recommendations

Best-Practice Recommendation	Lowers Program Cost	Increases Savings	Practiced In	Example
Nominal customer charge for energy audit	Reduced quantity of low-impact audits	Greater implementation rates due to serving motivated customers	MN, IL,VT, OH	NH: $100 audit fee, refunded to customers implementing at least 1 major measure
Option for comprehensive audit including testing		Greater implementation rates when customers have testing performed	MN, VT	VT: $100 rebate towards independent energy audit
Pre-screen eligibility for rebates based upon energy consumption	Reduction in "tire kickers"	Greater savings potential per customer	NH	NH: Customers must submit 2 yrs of utility bill and have HHI>8
Tiered incentive structure based upon performance		Encourages deeper savings per project	VT, WI	VT: Tiered incentives for air sealing depending on blower door test results
Bonus incentives for whole house projects		Better leverages customer investments	VT	VT: $250 bonus incentive for whole-house projects
Incentives tied to square feet of installed measure, not job price	Eliminates need to establish and maintain measure pricing		VT, OR	VT: $0.30 psf rebate for attic insulation >R49
Competitive free market pricing		Attracting more motivated contractors increases number of projects	ME	ME: 66% implementation rate with average project cost $8K

Best Practices, cont'd

Best-Practice Recommendation	Lowers Program Cost	Increases Savings	Practiced In	Example
Cap rebates per household	Eliminates multi-year phased retrofits	Encourages deep savings early-on	OR	OR: Incentives limited to one per address, regardless of ownership
Customer selects and contracts directly with Contractor	Eliminates overhead associated with project assignment & tracking.	Greater implementation rates through customer/contractor relationship	ME, OH	OH: Contractor quality ratings available on web site
Contractor bonus for bringing customers		Motivated contractors drive increase in implementation rates and savings	WI	WI: $100 bonus
Incentives available for DIY installations		DIY projects occur frequently and savings not captured by programs	VT, OR	VT: Projects verified through program
Random inspections with less than 100% frequency	Significant savings in program costs		NH, OH	NH: 10% PSNH inspection
Allow non-participating contractors to offer HEAT loans		Savings otherwise lost can be captured by the program.		

Recommendations Summary

- Separate programs for electricity savings and shell improvements
- Use pilot programs to try new approaches and implement what works well
- Adopt PA Cost Test instead of TRC Test
- Eliminate fixed pricing to attract more contractors
- Rebates according to square foot installed, not job price
- Pay for performance – rebate levels according to results achieved
- Rebates for independent audit vs. “free” HEA
- Open HEAT Loan program to non-MassSave contractors
- Revert back to 10% random inspections; discipline or eliminate contractors with persistent quality issues
- Require Lead Vendors to secure necessary building permits