

Impacts of a Customer Education Program Model: Energy Impact Findings

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Energy Savings: Actual vs. Projected

- Long History of Over-prediction
 - Predictions based on engineering calculations too high for most common energy measures
 - Studies typically find 50%-70% of projected savings
 - Problem more from models/inputs, not occupants
 - Prediction based on self-reported behavior?
 - “desirable response bias”
- But...many people want to believe
 - Actual usage isn't as reliable as projections? Too small to measure?
 - maybe for small groups, not for large groups

Low Cost Kit “Savings”

Iowa

Table 1. Iowa Average Participant Savings

Measure Installation	Iowa		South Carolina		Indiana	
	Electric (kWh)	Gas (therms)	Electric (kWh)	Gas (therms)	Electric (kWh)	Gas (therms)
CFL—1	80		28		95	
CFL—2	75		34		66	
Showerhead	101	20.7	330	5.4	224	7.4
Faucet aerator—kitchen	30	6.1	89	1.1	59	1.9
Faucet aerator—bathroom	46	9.4	195	2.4	29	1.0
Filter tone alarm	8	15.8	48	4.4	28	1.9
Education Impact						
Adjust hot water heater	17	4.2	67	1.0	31	1.9
Adjust heating	58	31.5	161	13.4	108	27.2
Adjust air conditioning	17		26		55	
Adjust refrigerator or freezer	8		8		1	
Reduce hot water use	22	3.5	90	0.8	696	41.3
Total Savings	462	91.3	1,076	28.5	1,393	82.6

- 3 programs summarized in Home Energy Magazine (Sep/Oct 2005)
 - Savings based on surveys and calculations -- appear high compared to WAP results.
- Iowa program was evaluated using billing data (Dalhoff 2006)
 - Measured Electric Savings = -46 (±161) kWh/yr (vs. 429 projected in report)
 - Measured Gas Savings = 21 (±17) th/yr (vs. 75 projected in report)
 - Zero average gas savings in bottom 80% of users
 - Poor assumptions and algorithms blamed for most of shortfall

Colorado Savings

Program	Electric Impacts			Gas Impacts		
	Assumed	Projected	Measured	Assumed	Projected	Measured
Direct Install	789	440	250 (± 56)	37	9	1 (± 4)
no showerhead					2	-4 (± 6)
showerhead installed					16	5 (± 5)
Mass Mailing		197	28 (± 36)		16	-2 (± 2)
Mass Mail - Reply Card		197	145 (± 86)		16	-2 (± 5)
Workshop		232	~		32	
ESP (HWAP)			496 (± 86)			151 (± 6)
no fridge			311 (± 98)			
fridge replaced			1023 (± 176)			

- All Measured impacts are preliminary
- Notes: Electric
 - Sample N: 1,226 DI; 4,244 Mail; 501 Reply; 441 ESP no fridge; 155 ESP fridge
 - Comparison group: ~12,000 LIHEAP matched on location, building, and usage
 - Pre-treatment use ~6,000 kWh/yr. for all groups
 - Impact results based on partial year post data, will be updated soon
- Notes: Gas
 - Sample N: 1,503 DI (938 Shwr, 565 not); 4,643 Mail; 903 Reply Card; 854 ESP
 - Comparison group: ~24,000 LIHEAP matched on usage
 - Pre-treatment use ~600 th/yr for all but ESP (850) due to targeting
 - Baseload savings: DI shwr=14; DI no shwr=4; Mail=5; Reply Card=3, ESP=25
 - Increased gas heat projected at .022 th/kWh of elec. savings, supported by data

Conclusions

- Electric and Gas Savings from low cost measures are generally over-estimated
 - Many clients may not install measures or may not keep measures (e.g., lights, showerheads)
 - Client self-reported behavior changes are questionable
 - desirable response bias
 - perhaps made some changes but did not keep them
 - is it realistic to expect long lasting and significant changes?
- If costs are low, then such programs may still be worthwhile
 - but not a substitute for major retrofit programs