

Incentive Programs in the United States

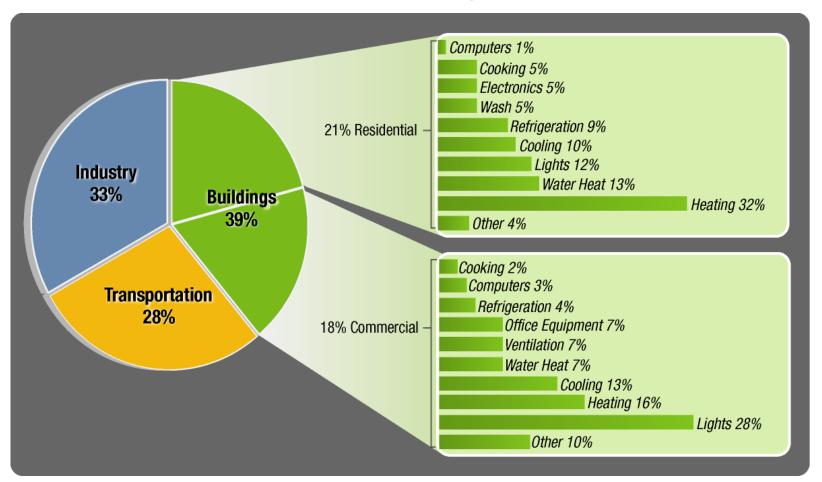
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Buildings' Energy Consumption by End Use



Buildings consume 39% of total U.S. primary energy

• 71% of electricity and 54% of natural gas



Two Regulatory Frameworks



Federal Programs

- Budget
 - Comes from tax
 - Generally Short term
- Focus
 - Push the market
 - Create job
 - Encourage local Manufacturers
- Examples:
 - Tax Incentives
 - ARRA
 - WAP

Utility Programs

- Budget
 - Rate Payer Funded
 - Sustainable funding
- Focus
 - Integrate Resource Planning
 - Energy Savings
 - Load Management
- Examples:
 - California
 - -NY
 - Vermont

Federal: EE Tax incentives



Context: EPAct 2005

Goal: advance the market share of advanced EE products (originally that have less than 5% of market share)

Appliances: clothes washers, dishwashers and refrigerators, new homes

Target Audience: Manufacturers, Builders and Consumers

Leading Examples: Incentive tax credit for refrigerator

Leading Examples: Refrigerator Case Study



 Tax credit incentive helped reaching more stringent level of standards and are therefore complementary to standards

US Program	\$ per unit produced	Improvement requirements
2001 Standard		
EPAct 2005	\$75 to \$175	15 to 25%
TARP bill 2008	\$50 to \$200	20 to 30%
Middle Class Tax Relief Bill of 2010	\$150 to 200	30 to 35%
2004 Standard		24%

Source: ACEEE, 2011

Federal: EE Tax incentives



Lesson Learned:

- —one product was commercially available but not ready for adoption: residential fuel cell cogeneration
- —The credit for one product did not last long enough to have an impact: heavy duty hybrids
- —One of the reason for the success of the refrigerator case study is its longevity
- Active engagement from stakeholders help to ensure the effectiveness of the program (Manufacturer were well informed on how to used the incentive Program)
- Educational Campaign help increase the number of participant in the programs
 - Ex: website on how to best take advantage of the tax credit

Utility EE Resource Standards and Goals



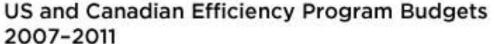
Energy Efficiency Resource Standards

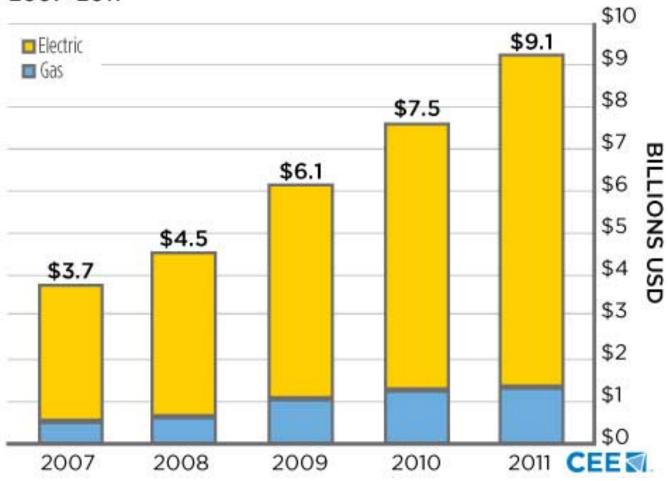


Note: See following slide for a brief summary of policy details. For more details on EERS policies, see www.dsireusa.org and www.aceee.org/topics/eers.

Ratepayer funded Efficiency Program Budget (US and Canada)







Examples of Utility Goals

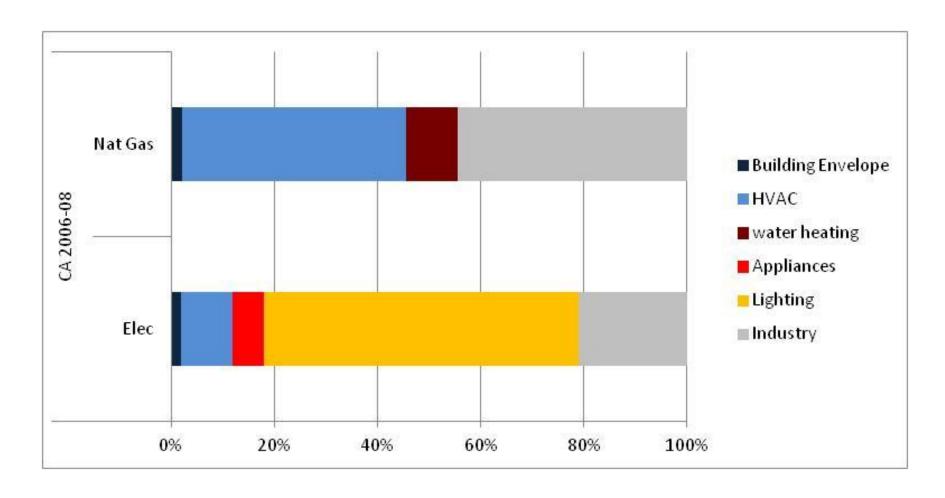


Country (pop in M)	Time Frame	Target	Capacity	Total Cost (\$Billion)
Vermont (Population: 0.6M)	2009- 2011	2.5%/y r	0.4 TWh	\$0.1
Massachuset ts (Population 6.6M)	2010- 2012	2.4%/y r	13.7MW, 42.8TWh	\$2.2
California (Population: 37M)	2010- 2012	10%/1 0 years	7 TWh, 3.5 TW, 150 Mtherms	\$ 3.1

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California





Program Design

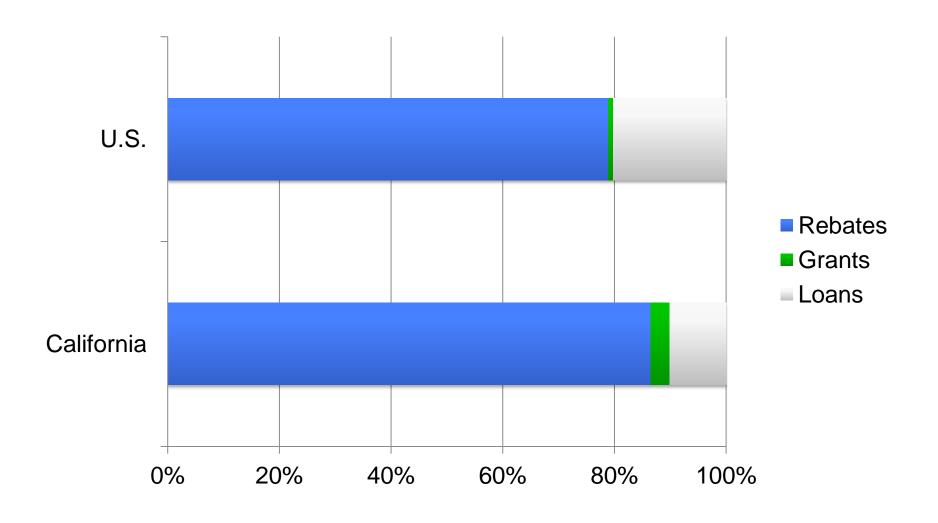


Direct Subsidies (upstream or downstream)

- —Rebates
- —Early Replacement Programs
- —Buy down
- Subsidized loans
 - —On-bill financing
 - —Low interest rate loans
- Third Party Financing

California Incentive Programs









give consumers a price reduction to purchase new energy-efficient appliances

Advantage: spillover effects to other customers (announcement effect).

US: very popular tool implemented by U.S. utilities (76% of the 1,390 FI programs reported in the DSIRE) database, are rebate programs.



Replacement Programs

replacing inefficient residential appliances before the end of their useful lives with significantly more efficient one.

Advantage: low-income households, opportunities to recycle material and potentially to comply with Montreal Protocol to remove chlorofluorocarbons (refrigerators)

U.S.: The Low Income Home Energy Assistance Program: federal Program since 1981, Administration of the program is left up to state.





give subsidies to retailers to incentivize them to carry energy efficient products

Advantage: Can address the principalagent problem. Also provides motivation for distributors to promote the targeted models.

TEXAS: 2001 Reliant Energy HL&P's A/C Distributor program in Houston, Texas

This was the first AC market transformation program in Texas. Qualifying distributors paid \$80/ton (up to 5.4 tons per installation) for the sale and installation of split air conditioner systems with documented 13+ SEER. Achieved 79% (5,904 tons) of the ex-ante goal of 7,500 tons. However, the average SEER for the incentivized ACs was significantly higher than the baseline eligibility (13.8 vs. 13).





give subsidies to manufacturers or retailers to buy down the wholesale price of energy efficient appliances.

Advantage: leverage investment, limit administrative costs, increase product availability at the retail sales

CA: 2006-2008 Upstream Lighting Program

CA utilities provided incentives to manufacturers averaging \$1.57 per bulb on nearly 100 million CFLs, resulting in an average discount for consumers at the register of \$2.70 per bulb.

THE UPSTREAM APPROACH

SHIFTING THE INCENTIVES FOR ENERGY EFFICIENT PRODUCTS

MOVING INCENTIVES UPSTREAM SAVES MONEY



MANUFACTURER REBATE PROGRAM **IMPLEMENTED BY** UTILITY

MANUFACTURER REBATE PROGRAM IMPLEMENTED GLOBALLY (OR REGIONALLY)





RETAILER



CUSTOMER REBATE PROGRAM **IMPLEMENTED** BY UTILITY









DECREASING TRANSACTION COSTS

Measure of Success



What was the initial goal?

Assessing how effective energy-efficiency policies have been requires first identifying the initial intended goal of the policy.

- Energy Savings
- Stimulate job creation
- Reducing the price of emerging technologies
- Boost domestic demand
- Spread information diffusion energy efficiency potentials

Measure of Success



how efficient the policy/program has been in achieving the original goal?

In other words, is the policy in place achieving its goal with the lowest cost-benefit ratio?

- Estimating the cost (administrative, implementation, evaluation)
- Estimating the savings (Net to Gross Ratio: % of savings strictly attributable to the policy considered and net from "free-riders" (program participants who would have purchased eligible products even if program was not available)

2010 Budget for Evaluation



% Budget allocated to EM&V

For organizations that reported EM&V expenditures greater than \$0

	Min	Max	Median	Mean	Number
Electric	0.1%	50%	3%	4%	92
Gas	0.5%	13%	3%	4%	52

Source: CEE

Lessons Learned



- Transformation of the market: After achieving 30-40% market saturation, financial incentives have minimal effect
 - —Disallows CFLs as a means to meet targets
 - —FI as a way to promote Equipment with the highest label rating
- Greater ex-post (and general) evaluation efforts are needed
- New programs offer an opportunity to introduce other policies (SWH incentive led to MEPS on that product)

Conclusion



FI programs are among the most effective policies used to manage the growth of electricity and natural gas demand.

FI are used increasingly by Government and Utilities across the world as a complementary EE policy to MEPS and Label Programs.

There is a need for information sharing

Information needs to be organized in a methodic way to be useful at different phase of policies and program implementation



Extra Slides

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EM&V for Utility Programs



Year		CPUC Mandated Goal	Reported Savings	Percentage of Goal	Evaluated Savings	Percentage of Goal
	Electricity (GWh)	6,059	9,999	165%	4,093	68%
2006-8	Peak (MW)	1,407	1,682	120%	776	55%
	Natural Gas (MMth)	112	140	125%	57	51%
	Electricity (GWh)	2,275	3,562	157%	3,294	145%
2009	Peak (MW)	478	617	129%	538	113%
	Natural Gas (MMth)	37	49	132%	39	105%