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Residential Efficiency Crossroads: Opportunities for the Future

Amy Ellsworth, CADMUS

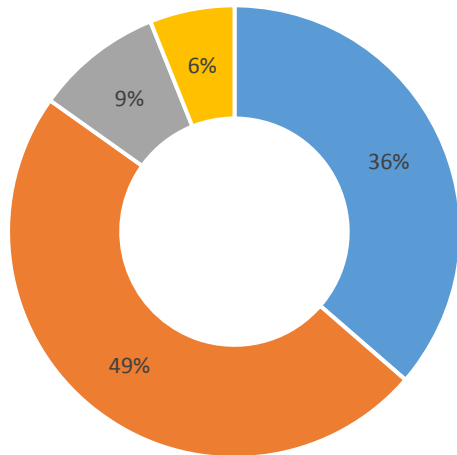
*Rocky Mountain Efficiency Exchange Conference
September 25, 2014*



Efficiency Savings Potential for 2030

Electricity (TWh)

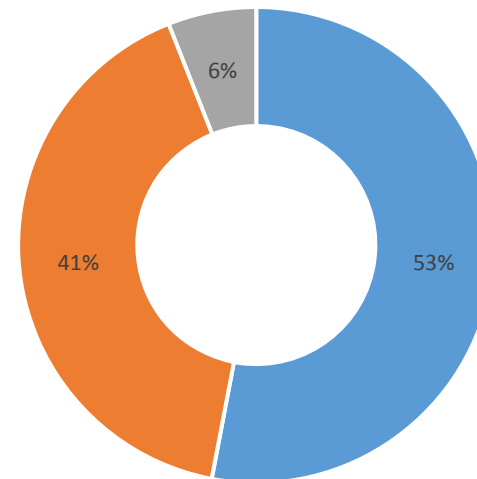
- Residential Programs
- Commercial Programs
- Industrial Programs
- Distribution System Efficiency



1162 TWh or 27% of total forecasted electricity consumption in 2030

Natural Gas (TBTU)

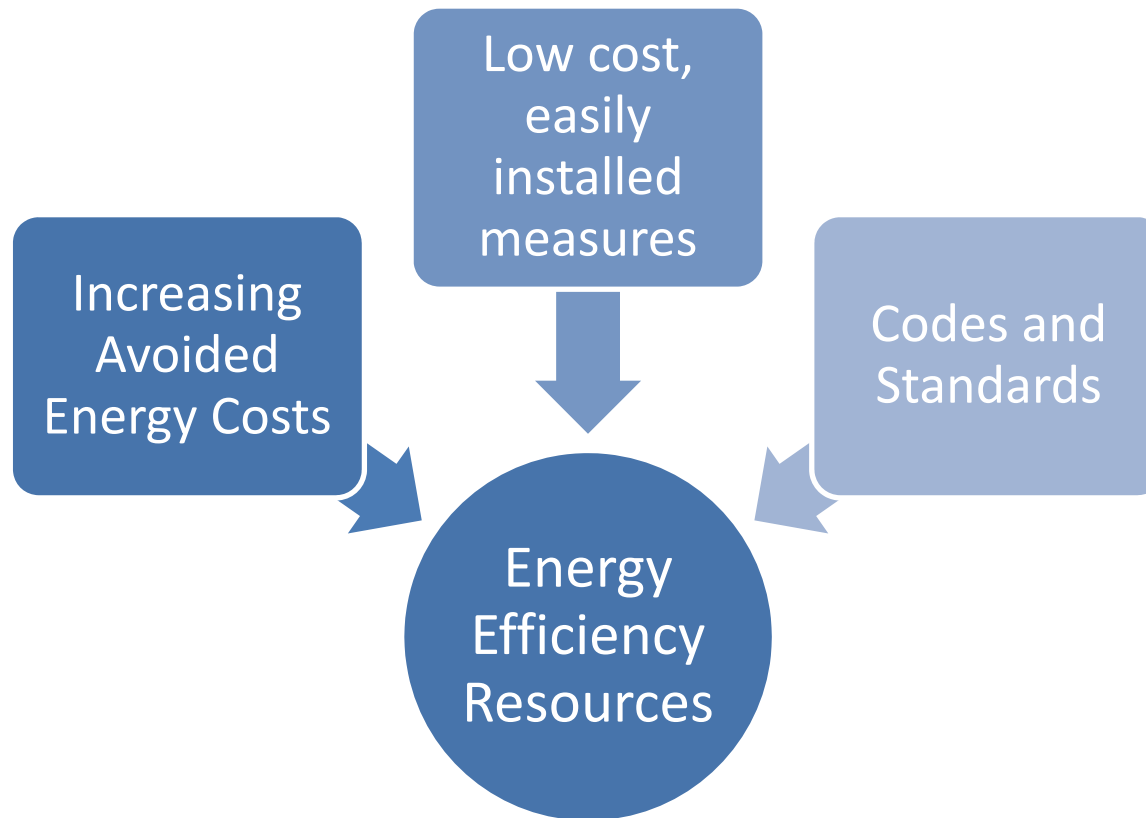
- Residential Programs
- Commercial Programs
- Industrial Programs



1887 TBTU or 19% of total forecasted natural gas consumption in 2030

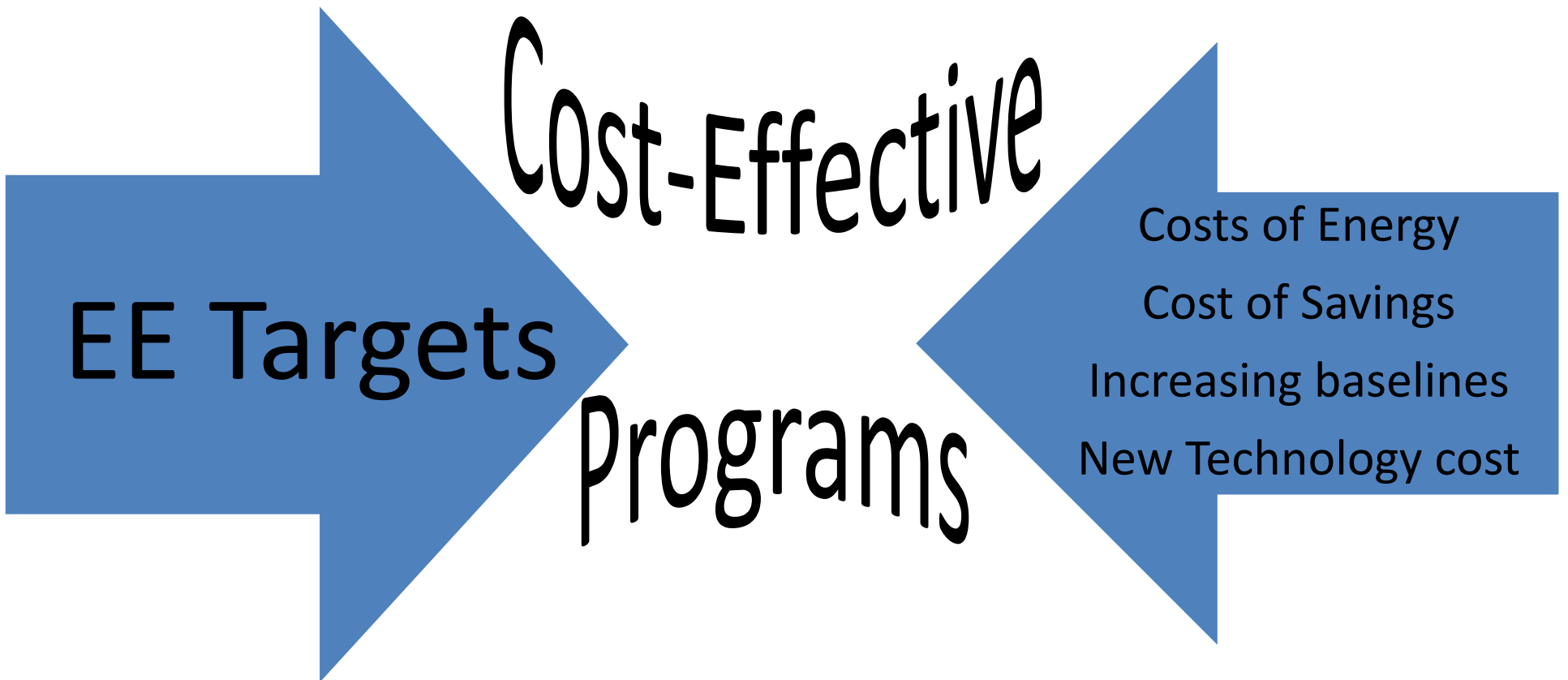


A short history of DSM





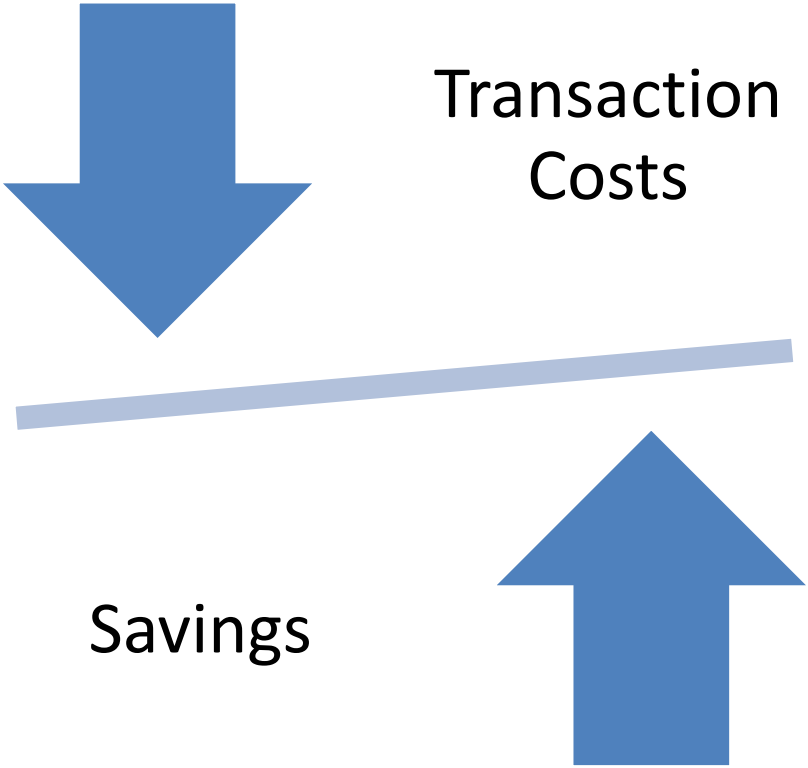
The Squeeze





Possible Directions for EE Planning

How can utility program sponsors continue to meet regulatory goals, while still providing ratepayer value?





Upstream/Midstream Programs

- Expanding the model
 - Pros: low participation barriers
 - Cons: difficult to evaluate
- Solution: technology-aided instant rebates





Off-site Residential Audits



- Pros: entry point to other programs, high customer satisfaction, informs EE investment
- Cons: expensive, no savings, lots of hand-holding, lots of barriers
- Solution: Advisor supported DIY audits

What if program sponsors could leverage currently available, multimedia channels and social networking to deliver similar services at a significantly lower cost?



Opt-out Programs

- Capitalize on behavioral theory- Inertia overcomes economically rational behavior
- Example: load control program supported by smart meter technology





Promising New Technologies

- LEDs, Heat Pump Water Heaters, Controls, Ductless Mini-splits
 - Pros: costs may be dropping (LEDs)
 - Cons: High costs remain, can be complicated (controls)





A bit about the TRC

	Benefits			Costs			Balanced
	Participant	Utility	Society	Participant	Utility	Society	
Participant Test	✓		✓	✓		✓	Yes
PAC Test or UCT		✓			✓		Yes
RIM Test		✓			✓		No
TRC Test		✓		✓	✓		No
Societal Test	✓	✓	✓	✓	✓	✓	Yes



- Included in test

- Included in test, but can be difficult to measure



If potential remains, but it cannot be cost-effectively captured under traditional program models, are those models still relevant?

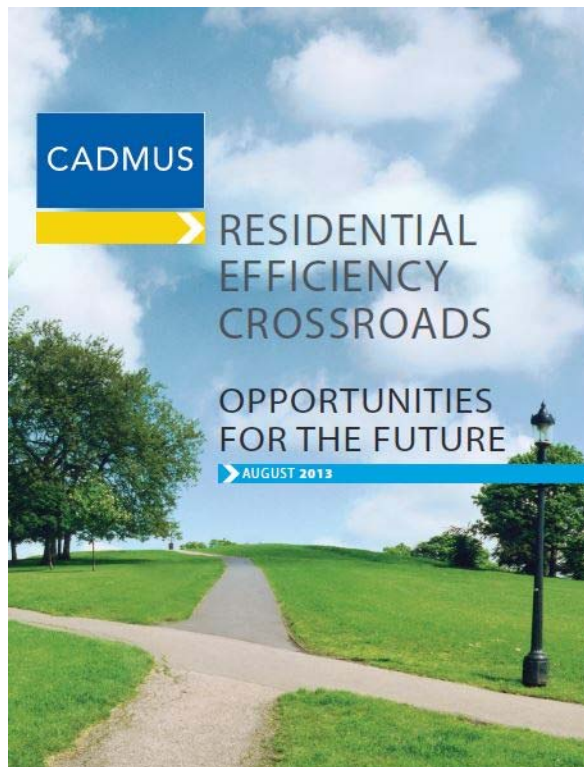


Modify the TRC or Replace it?

- Program Administrator Cost or Utility Cost Test
 - Equal treatment of efficiency and supply-side options
 - Symmetric – includes only utility costs and benefits
 - No imbalance from exclusion of non-energy benefits
 - Removes incremental cost of energy efficient measures/projects (only counts utility investment)
 - Compatible with integrated resource planning



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Finding Common Ground: Utilities & Regulators
M. Sami Khawaja, Hossein Haeri, and Brian Hedman
 June 2014

Due to our current analytic and political constructs, much of the potential for energy efficiency in the United States remains untapped. In order to optimize this potential, we must, quite simply, start thinking about energy efficiency as a resource, not unlike fossil fuels or renewable generation, even if it cannot be metered.

An optimal energy system is a mix of supply- and demand-side resources. Pursuing a strategy that contains a least-cost mix of these resources will produce a cost-effective, reliable, and environmentally responsible portfolio. However, this will also require a policy and regulatory structure that allows utilities to be indifferent between supply- and demand-side options for meeting resource needs.

As a resource, energy efficiency offers several advantages. It lowers costs, reduces fuel price risk, improves system reliability and energy security, creates jobs through direct and induced impacts, and offers a number of co-benefits such as increased property values. Perhaps the most important reason for pursuing energy efficiency is the reduction in greenhouse gases. Investing in energy-efficiency measures is cheaper per ton of carbon dioxide avoided than any other emission reduction alternative.

Despite its abundant benefits, current energy efficiency policies and analytical frameworks have been punitive to energy efficiency in three fundamental areas:

- Cost-effectiveness approaches
- Measurement of impacts
- Regulatory treatment of fixed-cost recovery and lack of earnings potential

Energy policy in the United States stands at a critical historic juncture. We can radically alter the way we use energy or we can continue our reliance on fossil fuels. We need a combination of more favorable cost and revenue recovery mechanisms, an earnings mechanism for demand-side management (DSM) expenditures, balanced cost-effectiveness tests, and a less punitive evaluation paradigm.

There are many potential ways to increase the slow adoption of energy efficiency, not the least of which is making energy efficiency more attractive to investors and energy producers. Deployment of energy-efficient technologies has to yield the same earnings opportunity that power plants have offered in the past. Straightforward policy decisions are needed to drive energy efficiency and create demand for its deployment that is on par with that of other fuels. Institutions that have previously been at odds need to form partnerships, align their goals to everyone's benefit, and consider multiple perspectives as sources of creativity and innovation. Energy efficiency can be a common ground for this progress.

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