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# **From programmes to markets – How to leverage market forces for energy efficiency**

***RAP / IEA DSM University webinar***

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# Defining Market-based Instruments

- **Instruments that are**
  - delivered by market actors
  - facilitated by a policy framework specifying the outcome (e.g. energy savings, emissions reductions, capacity resources, fuel poverty alleviation)
  - without prescribing the delivery mechanism and the measures to be used in order to achieve the desired outcome.

# Defining Market-based Instruments

- **Two broad types of programmes:**
  1. Energy Efficiency Obligations
    - Energy Savings Obligations
    - Energy Efficiency Resource Standards
    - Energy Efficiency Performance Standards
    - White Certificates
  2. Auction mechanisms
    - Energy Efficiency Auctions
    - *Capacity Market Auctions*

# Fundamental differences between MBIs

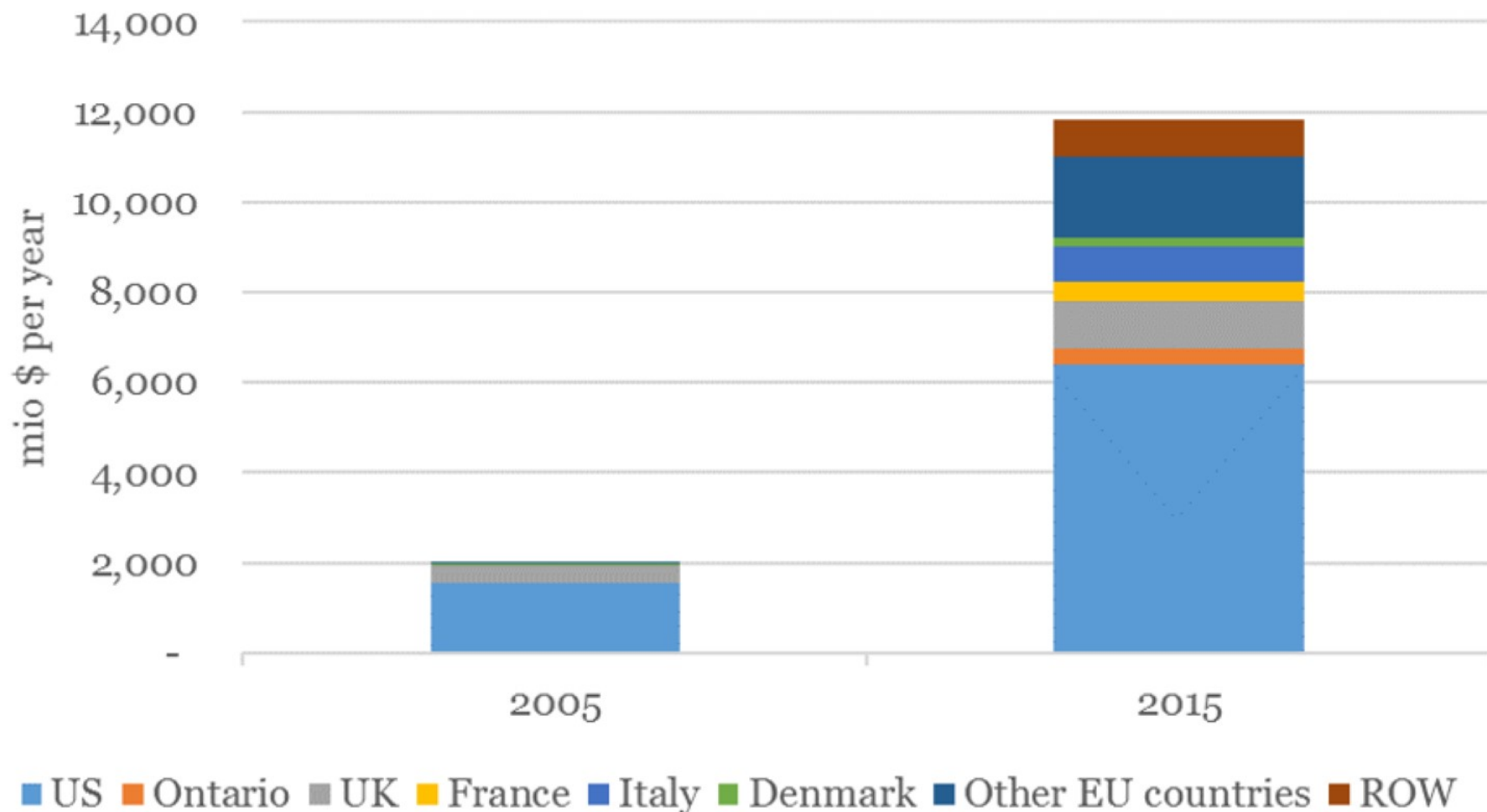
		Funds	
		<i>predetermined</i>	<i>not predetermined</i>
Savings	<i>predetermined</i>	most EEOs in vertically integrated markets	most EEOs in unbundled competitive markets
	<i>not predetermined</i>	energy efficiency auctions	capacity market auctions



# Drivers for market-based instruments

- **Cost-effectiveness**
  - Competition / profit motive
  - Technology and delivery route neutrality
- **Pivot to energy services**
- **Regulatory driver (e.g. in the EU)**
- **Importance of good policy design**
- **Policy makers can learn from experiences in other countries**

# Rise of public investment through MBIs

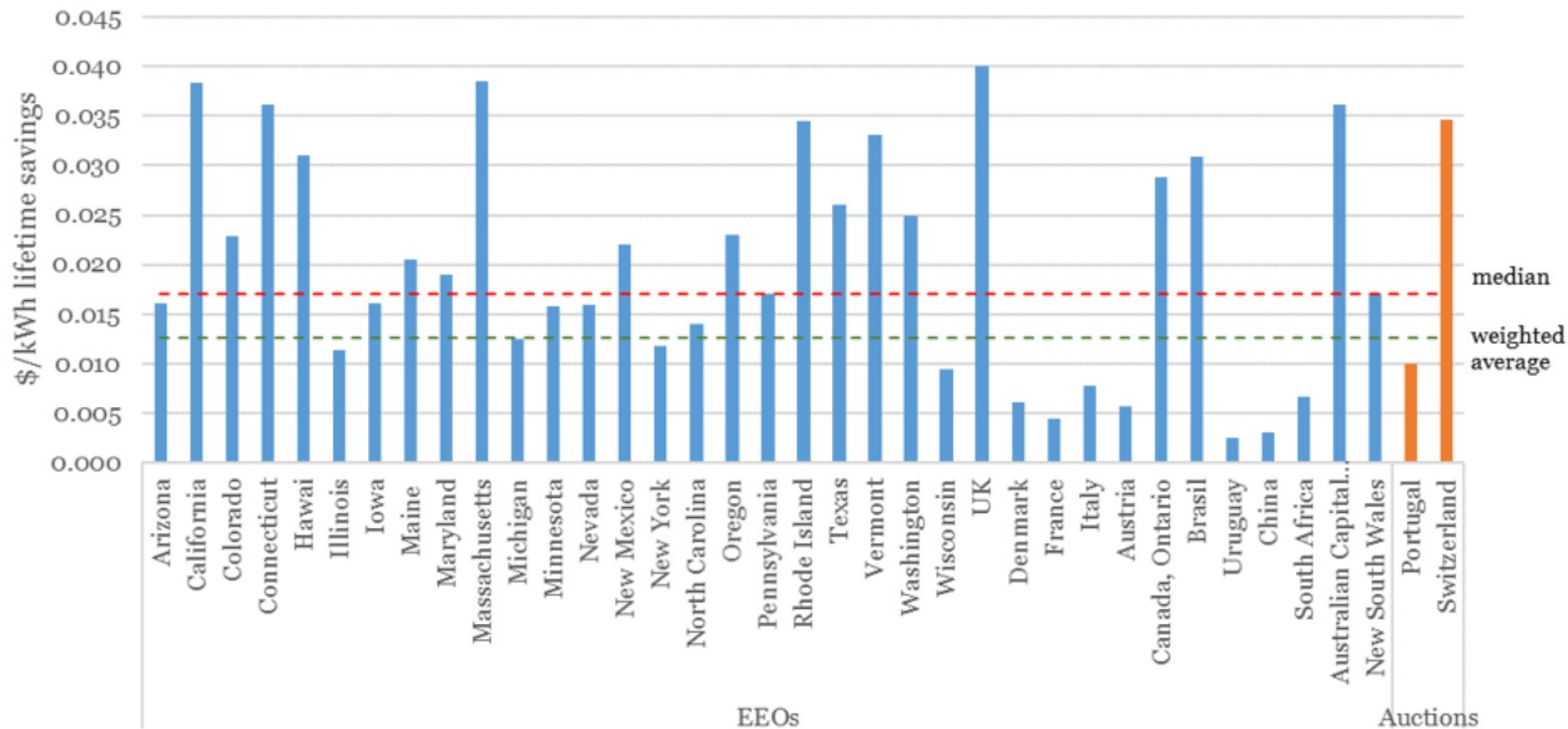


# Private investment: typically ~0.5-2 times public investment

Country	Share of private investment
US	141% of programme costs
UK	87% of programme costs in 2002 to 2005 and 44% in 2005 to 2008 (residential sector only, ~50% low-income households)
France	37% of programme costs (EEOs operate together with tax rebates)
Denmark	200% of programme costs (industry sector only)

# Available data indicates that MBIs are cost-effective

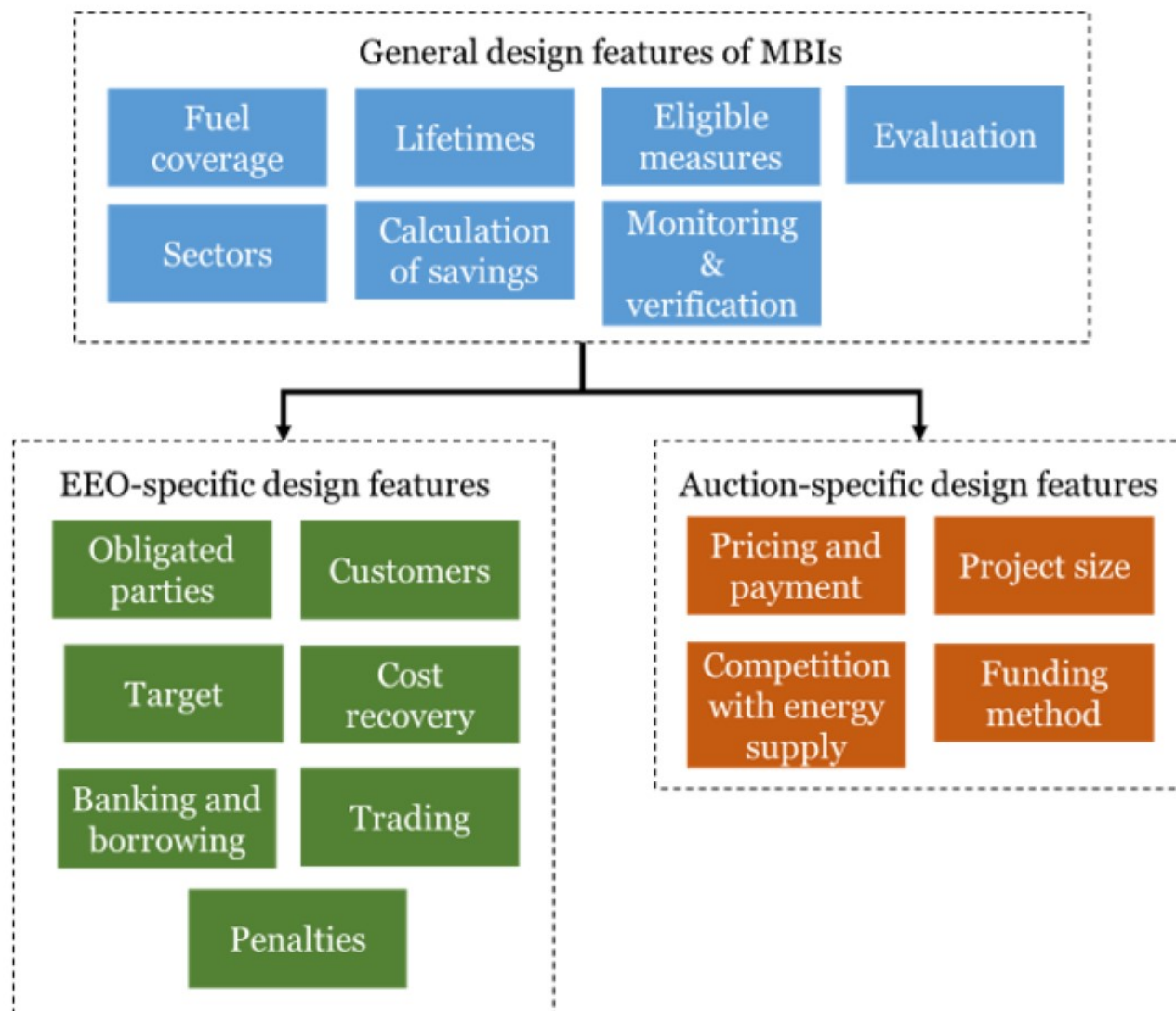
**Avoided costs and total benefits are significantly higher than costs of programmes**





# Design features of MBIs

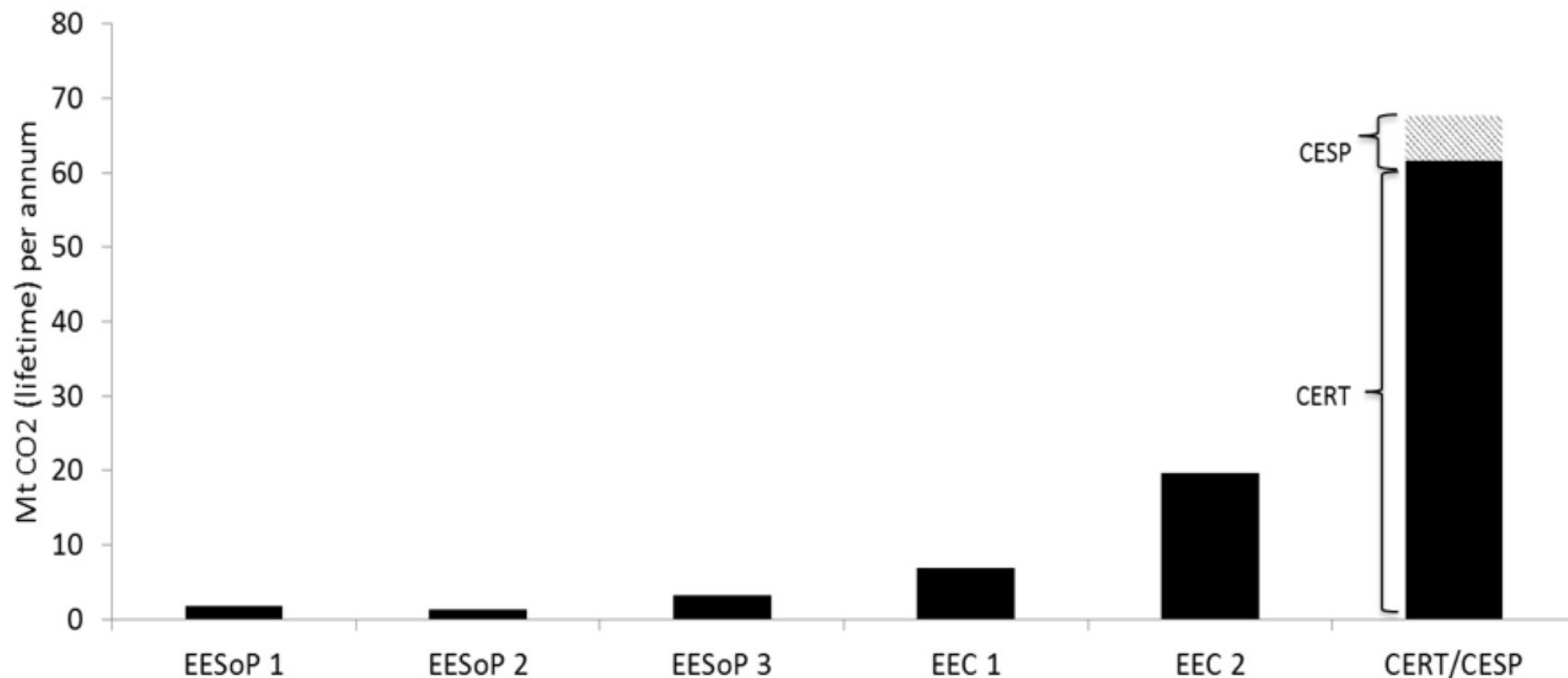
Context shaping instrument design



# What makes a 'good' MBI?

# Lesson 1: “Start small and grow big” to allow for policy learning and the supply chain to develop

## Example of staged approach to MBIs - UK



Source: Rosenow (2012)

## Lesson 2: Deliver up to 2% incremental savings per year

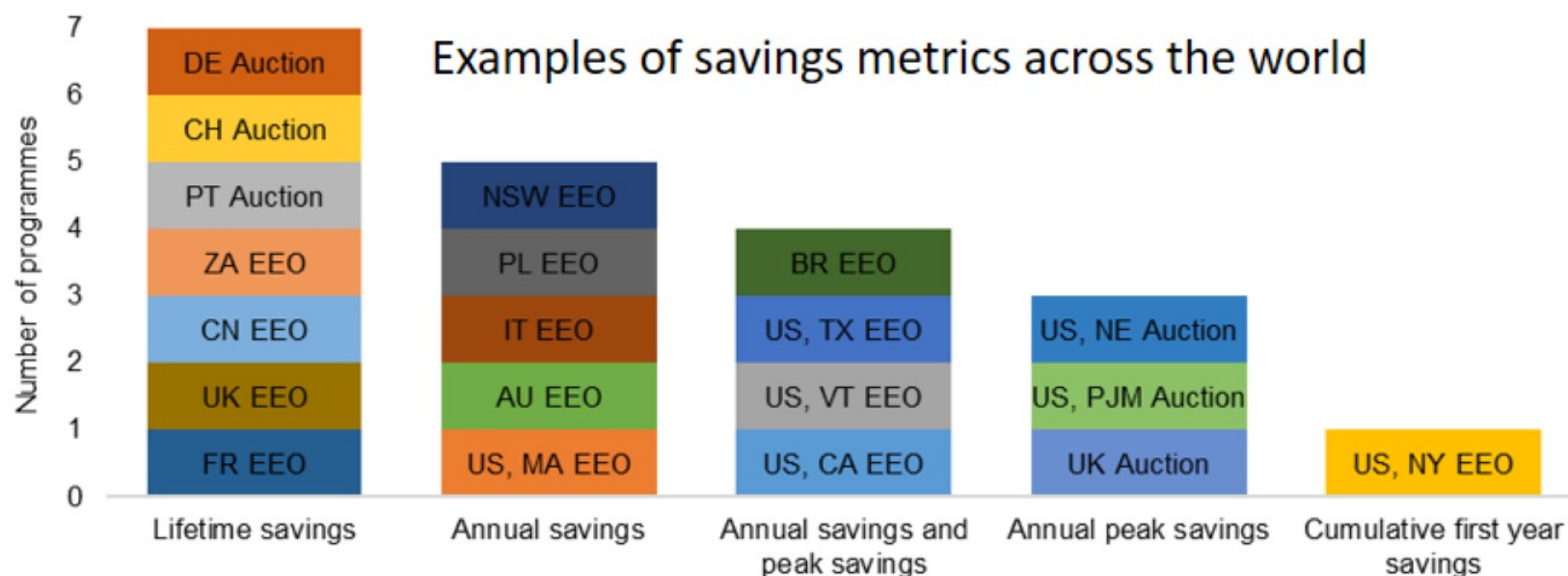
- **Well-designed MBIs can deliver about 2% incremental savings of obligated fuels:**
  - Arizona: -2% annually, over 20% in 10 years
  - Australia: New South Wales: growing to save 34% in 11 years
  - Energy Efficiency Directive: 1.5% annually, up to 26% by 2030
- **Leading programs spend 3% to 5% of system revenues on energy savings**



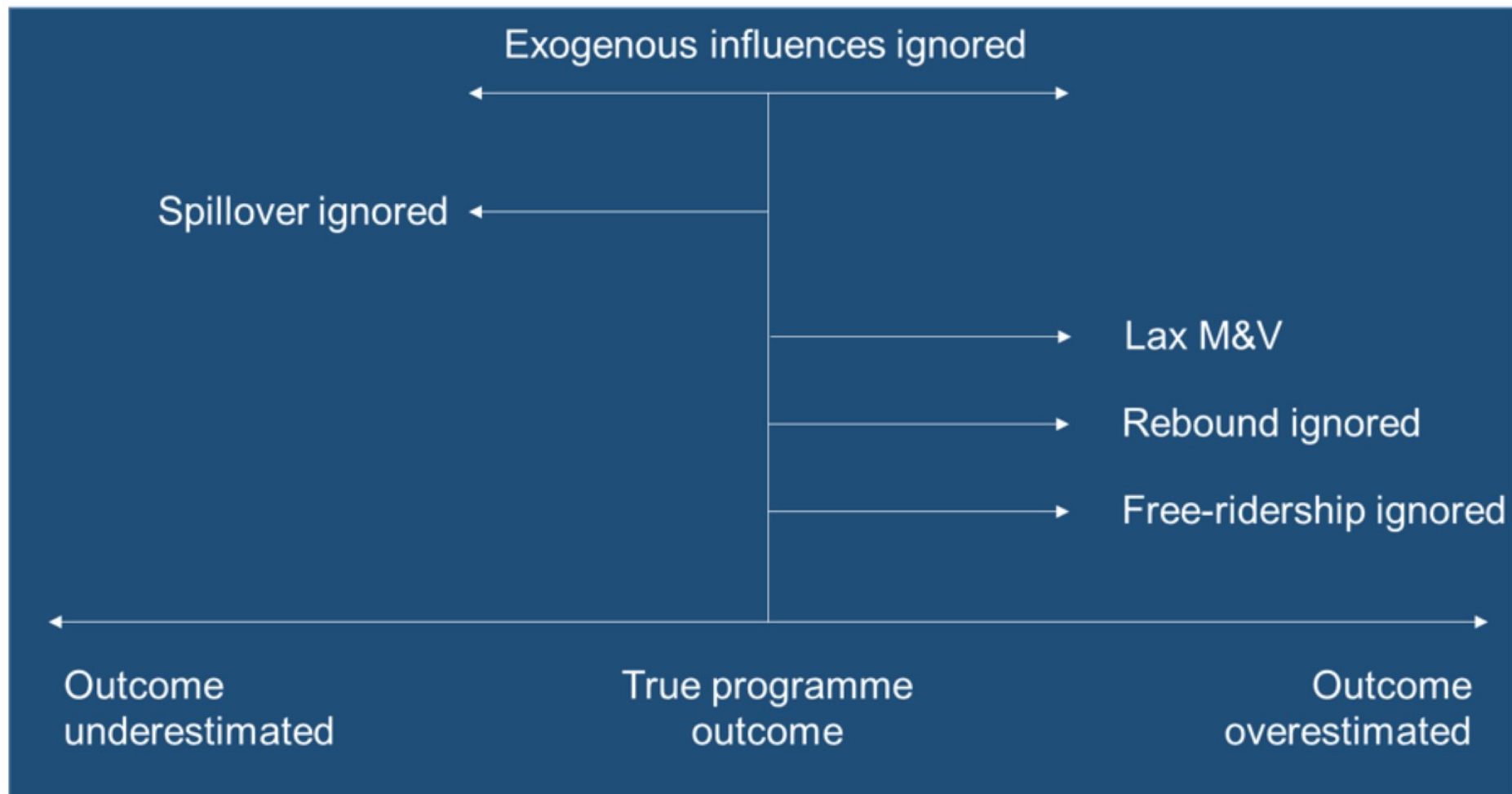
# Lesson 3: Focus on longer-lived measures

Examples of incentivising longer-lived measures:

1. using lifetime savings as a metric
2. providing an incentive for measures with longer lifetimes (e.g. 50% more savings for longer-lived measures accredited)
3. Minimum quotas for longer-lived measures or maximum quotas for shorter-lived measures



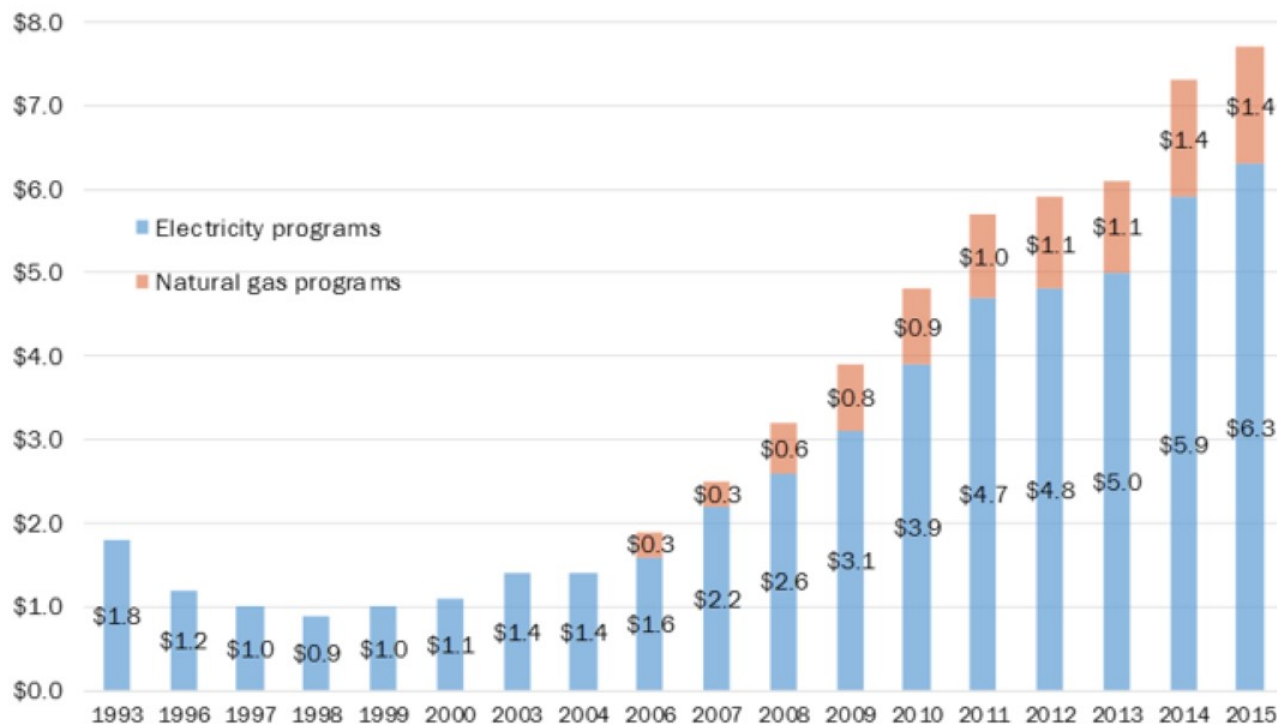
# Lesson 4: Build in robust EM&V system and continuous improvement



Source: adapted from Wade and Eyre (2015)

# Lesson 5: MBIs are successful in a range of situations

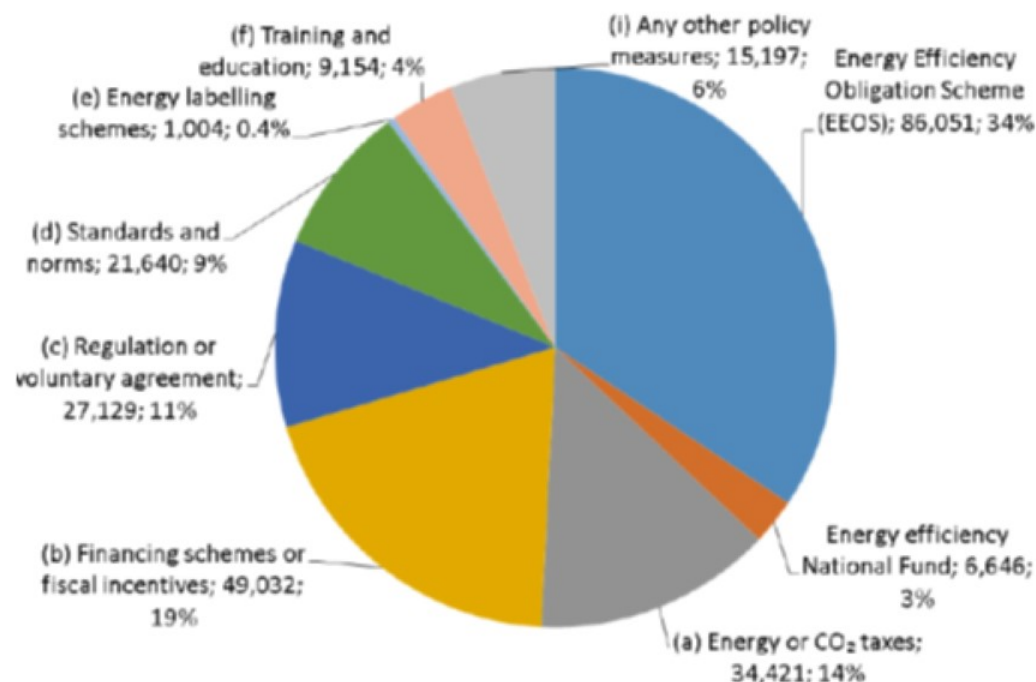
- EEOs in the US work well in vertically-integrated states and in states with retail competition
- Where to place the obligation? It can be on retailers, on distribution companies, “efficiency utilities” or special purpose entities
- US utility spending now \$7.7 Billion in 26 states



# Lesson 5: MBIs are successful in a range of situations

## Europe: EEOs in liberalized markets without a tradition of IRP

- EEOs provide more than 1/3 of savings required by Article 7 of the EU Energy Efficiency Directive
- Obligations on retailers (France, UK) and distributors (Denmark, Italy)





## Lesson 6: Design the Program to Work for Customers: EEOs Must Overcome Stubborn Market Barriers

### Market barriers

Lack of information

Upfront costs

Payback periods - high implicit discount rate

Consumer inertia: Hassle factor, timing mismatches

Split incentives – eg,  
Builder/buyer  
Tenant/landlord

Unpriced external costs

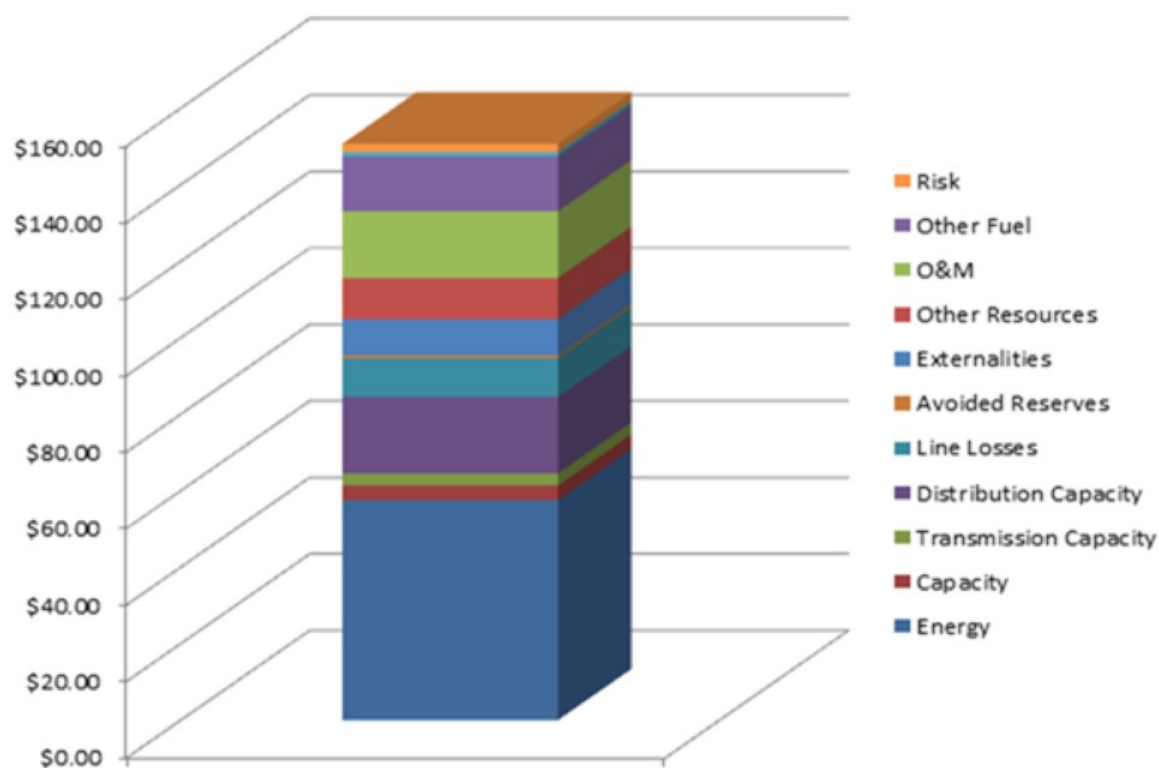
Uncompensated benefits –eg, system reliability

### Key Lessons, 20+ years Experience:

- **Barriers are same** in both traditional utility systems and liberalised markets (EU & US have both)
- **Single-barrier attempts don't work** (pricing alone, financing alone, etc.)
- **Consumers need** trusted information, quality assurance, and financial help
- **Public investment (from gov't or all consumers) is needed** to remove barriers & leverage sufficient private investment in EE.

# Lesson 7: EE multiple benefits larger than we thought

**Vermont Energy Efficiency Savings Value  
2010 Program Savings**

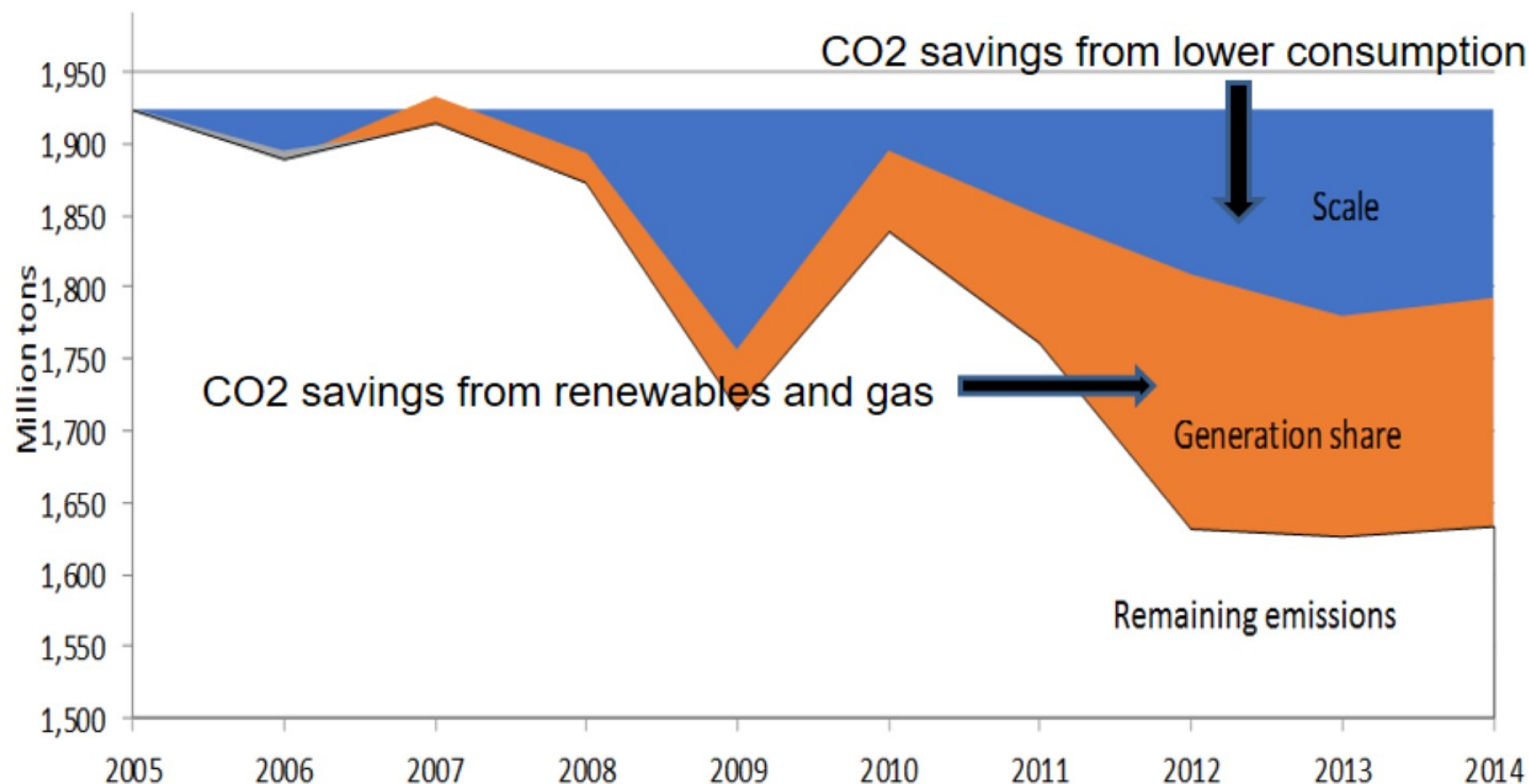


Benefit values<sup>1</sup> per MWh of electricity savings

- Production Energy
- Production Capacity
- Avoided Emissions
- Transmission Capacity
- Distribution Capacity
- Line Loss Reduction
- Avoided Reserves
- Lower Risk
- **PLUS Non-Energy Benefits**
  - Environment, Air, Water
  - Building durability, comfort
  - Health & safety

# Demand reduction has reduced US carbon emissions almost as much as renewables and natural gas combined

Panel C. Carbon dioxide



Source: **The Sources of Decreasing US Electricity Sector Emissions**  
[Joshua Linn](#), [Kristen McCormack](#) (Posted at Resources for the Future, Jan 3, 2017 )



## Lesson 8: Stable & adequate funding is essential

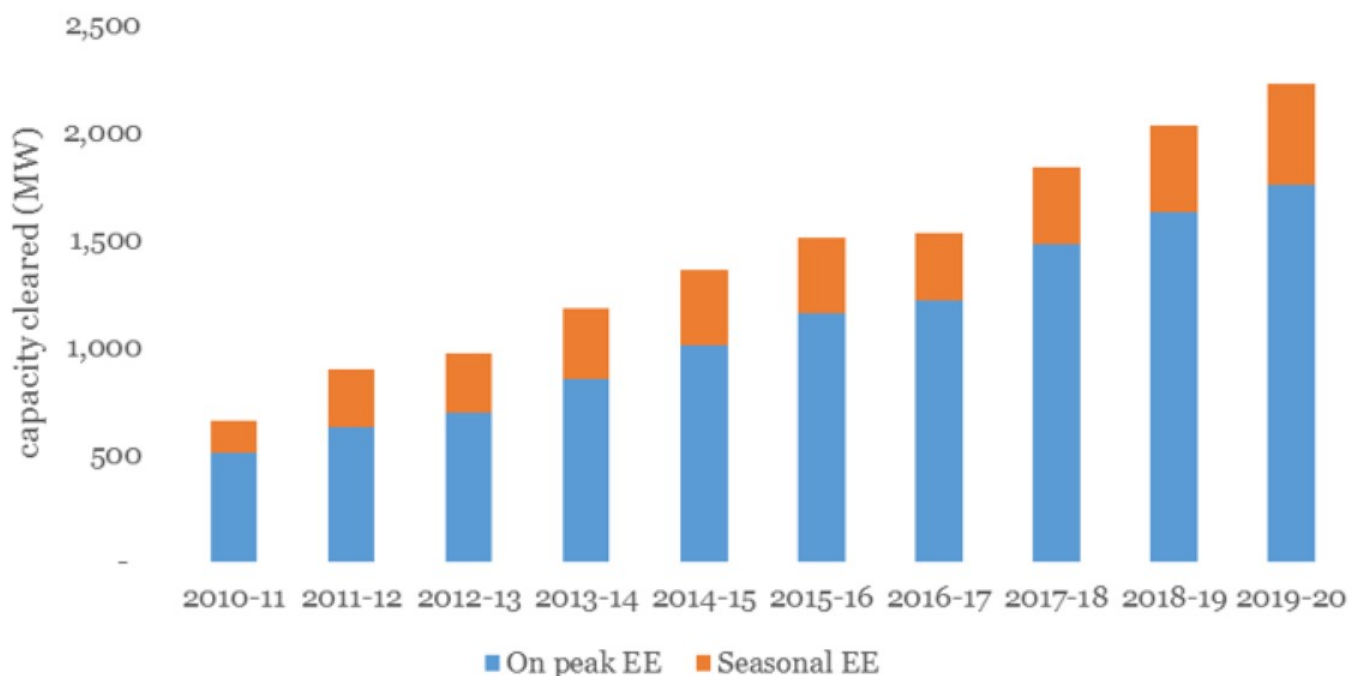
- **Adequate and stable** – not annual appropriations
- **Utility sector funds** are not Treasury receipts! **Funding in rates or through wires/pipes charges** in North America is considered **part of providing safe and reliable energy services**
- **Benchmark level ?** – strong programs spend 3% to 5% of annual system revenues
- **Numerous Funding Options** are available:
  - ❖ **Supplier Obligation** – Rolled into energy costs (UK, France, Texas)
  - ❖ **Supplier Obligation** – Paid for via a Distribution-based tariff (Italy, Denmark, Vermont, California)
  - ❖ **Distributor Obligation** – Paid for via Distribution tariff
  - ❖ Other ideas: **Capacity markets, Tax credits**
  - ❖ **Carbon auction revenue** – a growing opportunity



# Market-Based Reliability: EE & DR Bidding in Regional Capacity Markets

**Competitive idea: allow EE and DR to bid alongside supply to meet reliability needs.**

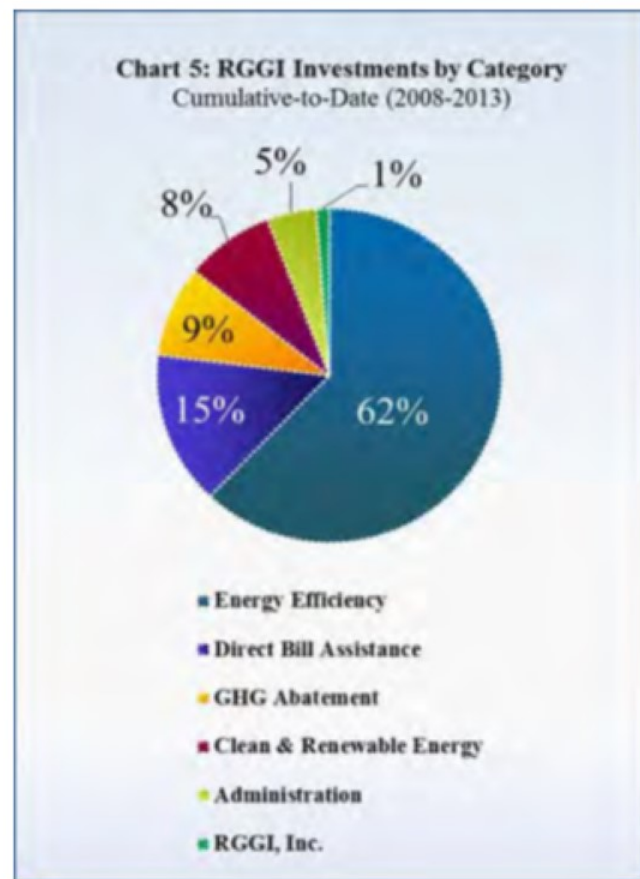
**EE will deliver 2200 MW of capacity savings in New England**



- Substantial consumer cost savings
- Capacity market by itself is not enough to finance needed EE
- Existing EEOs in the states are creating the resource

# Carbon Revenues for Efficiency: Lessons from the US Northeast

- 9 States in NE US
- Cap and trade for power sector
- 40% reduction in CO<sub>2</sub> since 2005
- States invested most carbon revenues (\$1 Billion+) into EE, RES, low income HH
- **Consumers saved \$2.9 Billion on power bills**
- Politically popular program renewed with much lower carbon cap



See Cowart, R., Keay-Bright, S., and Lees, E. (2015). Carbon Caps and Efficiency Resources: Launching a "Virtuous Circle" for Europe. The Regulatory Assistance Project. Available at: <http://www.raponline.org/document/download/id/7515>

**Thank you for your attention!**



# Regulatory Assistance Project (RAP)

**RAP is a global, non-profit team of experts providing technical and policy assistance to government officials on energy and environmental issues. RAP has advised governments in more than 30 countries and 50+ provinces and states, and now has major programmes in the US, China, India and Europe.**

**Richard Cowart is the Director of European Programmes, based in Brussels. Richard is a member of the IEA DSM Executive Committee, served 12 years as Chair of the Vermont PSB (utilities regulator), and Chaired the US regulators' Committee on Energy & Environment, the National Council on Competition and the Electric Industry, and the US DOE's Electricity Advisory Committee.**

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Samuel Thomas is a senior energy efficiency analyst at the International Energy Agency (IEA) where he leads a programme of analytical work on energy efficiency, including the IEA's annual Energy Efficiency Market Report, the Policy Pathway series and current projects on market based instruments for energy efficiency. Before joining the IEA in 2014, Sam was Deputy Director for Climate Change Economics and Energy Efficiency Analysis at the UK's Department of Energy and Climate Change (DECC), where he led the analysis supporting the UK's Climate Change Act, the EU ETS implementation, strategies on energy efficiency, heat and fuel poverty; and the UK's supplier obligations.

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