Efficiency Obligations in the US – Successes, Challenges, Lessons

Worldwide Review of Energy Efficiency Obligation Schemes

Presented by Richard Cowart
Regulatory Assistance Project

December 10, 2015
Major Points Today

1. “Efficiency First” is the key to the low carbon transition and Efficiency Obligations (EEOs) are a powerful tool to deliver savings
2. Deep US experience -- >60% of US load is served by EEOs active in 25 states
3. EEO schemes vary – many approaches work
4. Key features of successful EEOs
5. Carbon revenue can drive EEOs even faster
Daily Climate News – Often How My Day Begins
Efficiency First – Do we have the political will to act?

...the energy we do not use is the cheapest, most sustainable and most secure energy there is. The EU is already a world leader here; but I think we can do so much more. It starts with taking "efficiency first" as our abiding motto.

--Arias Canete, EU Climate Action and Energy Commissioner February 2015

• “If I were emperor of the world, I would put the pedal to the floor on energy efficiency and conservation for the next decade.”

— Dr. Stephen Chu, United States Secretary of Energy, 2007
EEOs in the US – Context

- Regulation of power and gas delivery lies mostly with the states, acting largely through state regulators (PUCs or PSCs)
- Thus, EEOs in the US are **state-based**, not federal programs
- 1980s and 1990s – States pushed vertically-integrated utilities to conduct “least-cost integrated planning” including end-use efficiency. Many utilities launched efficiency programs.
- 1990s and later: When competition reforms (“restructuring”/liberalisation) arose in about half of the states, many states built on this history to continue EEOs in the new market structures.
- The US has decades of EEO experience in the “laboratories of democracy” in both traditional and restructured markets.
>60% of US load is in EEO States

Utility Spending now $7.3 Billion

- Electricity programs
- Natural gas programs

Year: $1.8 $1.2 $1.0 $0.9 $1.0 $1.1 $1.4 $1.4 $1.6 $0.3 $0.6 $0.8 $0.9 $1.0 $1.1 $1.1 $1.4

Yearly Spending:
- 1993: $1.8
- 1996: $1.2
- 1997: $1.0
- 1998: $0.9
- 1999: $1.0
- 2000: $1.1
- 2003: $1.4
- 2004: $1.4
- 2006: $1.6
- 2007: $0.3
- 2008: $0.6
- 2009: $0.8
- 2010: $0.9
- 2011: $1.0
- 2012: $1.1
- 2013: $1.1
- 2014: $1.4
Who’s Obligated? –
A range of successful approaches are in place

1. Obligation on regulated distribution utility [Most US states, including California, Ontario, Italy, Denmark]
2. Obligation on competitive retail suppliers [Texas (via 3rd parties under performance contracting) Great Britain, France, Ireland, and 3 three Australian states]
3. Obligation funded by levy on distribution companies, but borne by a state agency [Oregon & New York (partially)]
4. Obligation funded by levy on distribution companies but borne by an independent “Energy Efficiency Utility” [Efficiency Vermont; Efficiency Maine]
Who Should Be Obligated? Who Should Deliver?

"Top 10" US States Showcase 5 Different Models

<table>
<thead>
<tr>
<th>State</th>
<th>Efficiency Portfolio Manager Structure of Top 10 States*</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>Regulated Utility (e.g., DNO)</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Regulated Utility (e.g., DNO)</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Regulated Utility (e.g., DNO)</td>
</tr>
<tr>
<td>Vermont</td>
<td>Contracted Private Entity</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>Contracted Private Entity</td>
</tr>
<tr>
<td>New York</td>
<td>Unit of Government</td>
</tr>
<tr>
<td>Oregon</td>
<td>Sole-Purpose Public Corporation</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Regulated Utility (e.g., DNO)</td>
</tr>
<tr>
<td>New Jersey</td>
<td>Contracted Private Entity</td>
</tr>
<tr>
<td>Washington</td>
<td>Regulated Utility (e.g., DNO)</td>
</tr>
</tbody>
</table>

*Ranking by ACEEE based on depth and breadth of EE programs
A national mandate is needed to overcome slow progress and underperformance in many states...
Figure 7 U.S. Electric Program Budgets per Capita by State, 2009, Energy Efficiency Only (Excludes Load Management)

* Information from at least one known electric program administrator is missing from this state.
** Includes aggregated data from Idaho, Montana, Oregon, Washington, the Northwest Energy Efficiency Alliance and the Bonneville Power Administration.
† A portion of this state’s budget is incorporated into Tennessee Valley Authority’s regional budget.
EEOs are highly cost effective

• US state EEOs save electricity for 2-4 US cents/kWh compared to 6-9 cents per kWh for generation cost alone.
• Gas savings – cost $\frac{1}{2}$ to $\frac{1}{3}$ the cost of gas supply.
• PLUS: EE also saves on transmission and distribution upgrades, lowers reserve margins and line losses, has no emissions, improves reliability, lowers peak loads.
• “Merit Order Effect”: In competitive power markets, lower demand also lowers clearing prices for all consumers – not just consumers who save energy.
• In some cases, this effect alone could justify the entire cost of the EE program.
• EE provides low-cost – even negative cost -- carbon reduction.
End-Use Efficiency Has Many Power System Benefits

- Production Energy
- Production Capacity
- Avoided Emissions
- Transmission Capacity
- Distribution Capacity
- Line Loss Reduction
- Avoided Reserves
- Plus “Non-Energy” Benefits including: Add’l resource benefits (water), building durability, health & safety

Note: numbers presented in graph are illustrative but consistent with published studies in the US and Germany.
Strong Programs Add 2% Incremental Savings Per Year

- Energy savings add up, can become one of the largest energy resources in the economy.
- Some obligations now in place:
  - New York: -2% per year by 2015
  - Arizona: -2% annually, over 20% in 10 years
  - Illinois: -2% annually, 2015-2022
  - Massachusetts: -2.3% per year through 2020
  - New South Wales: growing to save 34% in 11 years
- Leading programs spend 3% to 5% of system revenues on energy savings (.... and save more )
EE savings grow over time; utility programs are in addition to other public policies (California example)

California efficiency investments lowered demand by 25% over 25 years*
Quality Control, M&V, and Continuous Improvement are Needed

- Strong, **independent oversight** is needed – usually via independent regulators and transparent reviews
- Down side of EEOs: Without oversight, programs see cream-skimming, poor quality control, slow learning curves
- Plus side: Ambitious programs benefit from economies of scale, market transformation, and good quality oversight
- Positive signals: The most active, experienced jurisdictions – e.g., California, Massachusetts, Vermont, New South Wales – are seeking to EXPAND their programs. (Exception: UK 2014-15)
“Learning Curve”: Over Time, Annual NEW Savings Grow

EEO states’ new savings as % of TOTAL US sales

Source: ACEEE 2014 state efficiency scorecard
Stable & adequate funding is essential

• Challenge: how to finance EE programs that must be much larger and cross fuel types?
• Public Funding = 25-30%; Private Finance = 70-75%
• Adequate and stable – not annual appropriations
• Utility sector funds are not Treasury receipts!
• FUNDING side: Benchmark level -- at least 3% to 5% of annual system revenues
• Revenue collection and program administration can be different.
• Numerous Funding Options are available
• Many options are competitively-neutral, do not interfere with competition
Paying for Energy Efficiency – Several Options for the “Public” Portion

- Supplier Obligation – Rolled into energy costs (UK, France, Texas)
- Supplier Obligation – Paid for via a Distribution-based tariff (Italy, Denmark, Vermont, California)
- Funding in rates or through wires/pipes charges in North America is considered part of providing safe and reliable energy services
  - Regulator authorizes collections for service, as for transmission, meters, reserve costs, etc. – these are NOT public Treasury receipts.
- Other ideas: Capacity markets, Tax revenues
- Carbon auction revenue – a huge new opportunity
  - (RGGI – 9 states; German carbon fund, Alberta)
Carbon Revenues for Efficiency: Lessons from the US Northeast

- 9 States in NE US
- Cap and trade for power sector
- 40% reduction in CO2 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

Thank You – Questions?

Richard Cowart is the Director of European Programmes for RAP, based in Brussels.

A member of the IEA DSM Executive Committee, he served 12 years as Chair of the Vermont PSB (utilities regulator), Chaired the US regulators' Committee on Energy & Environment, and the National Council on Competition and the Electric Industry. He is now an advisor to the New York Independent System Operator, and Chair of the Electricity Advisory Committee of the US Department of Energy.
About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power sector. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

Learn more about RAP at www.raponline.org

Rich Cowart
rcowart@raponline.org