

# The Shifting Landscape of Ratepayer-Funded Energy Efficiency in the U.S.

**Charles Goldman**

*Lawrence Berkeley National Laboratory*

**ACEEE 5<sup>th</sup> National Conference on Energy Efficiency as a Resource**

Chicago, IL

September 29, 2009



This work was supported by the Office of Electricity Delivery and Energy Reliability and by the Office of Energy Efficiency and Renewable Energy, Weatherization and Intergovernmental Program of the U.S. Department of Energy under Contract No. DE-AC02-05CH11231.

# Presentation Outline

---

- **Analysis of recent trends in state policies affecting ratepayer-funded energy efficiency (EE) programs**
- **Berkeley Lab's projection of EE spending and savings through 2020**
- **Potential implications and applications**
  - **Assess potential incremental impact of a national EE portfolio standard (EERS) or contribution to national greenhouse gas emission reduction targets**
- **Key challenges to dramatically scaling-up ratepayer-funded EE program activity**

# Current EE Funding is at an All-Time High but is Concentrated in 10 States

- **2008 U.S. electric and gas EE budget = \$3.1B**
  - ~ 20% increase over 2007
- **Approx. 80% of total funding is concentrated in 10 states**
  - CA represents 1/3<sup>rd</sup> of U.S. total
  - Not shown in table are states with small populations but high per-capita funding (VT, OR, ID, IA, RI, NH, UT)
- **Approx. 85% of total funding is for electric end-uses**

## 2008 Ratepayer-Funded EE Budgets

Rank	State	2008 Budget (\$M)		
		Electric	Gas	Total
1	CA	831	183	1,014
2	NY	258	30	288
3	NJ	135	61	196
4	WA	160	18	179
5	MA	121	28	149
6	WI	76	64	140
7	MN	106	30	137
8	FL	109	15	124
9	CT	107	7	114
10	TX	106	no data	106
All Other States		592	94	686
U.S. Total		2,603	529	3,132

Source: CEE; excludes budget for load management programs.

# New State Policies Suggest that EE Landscape is on the Verge of Dramatic Change

- **Traditionally leading states are poised to redouble their efforts**
  - New EEPS policies adopted or under consideration (NY, WI, NJ)
  - Statutory requirements to acquire all cost-effective EE (CA, CT, MA, RI, WA)
  - Aggressive EE acquisitions in IRPs (PacNW)
- **Substantial funding increases are expected in a number of “up-and-coming” states**
  - New EEPS policies (CO, IL, MD, MI, NC, NM, OH, PA, HI)
  - Aggressive EE acquisitions in IRP/DSM plans (AZ, CO, NM, NV)
- **~20 states (mostly in Southeast and parts of Midwest) have not yet made significant commitments to ratepayer-funded EE**

# Berkeley Lab Projections of Ratepayer-Funded EE Program Spending & Savings

**LBNL developed Low, Medium, and High projections of electric and natural gas energy efficiency program spending and savings through 2020**

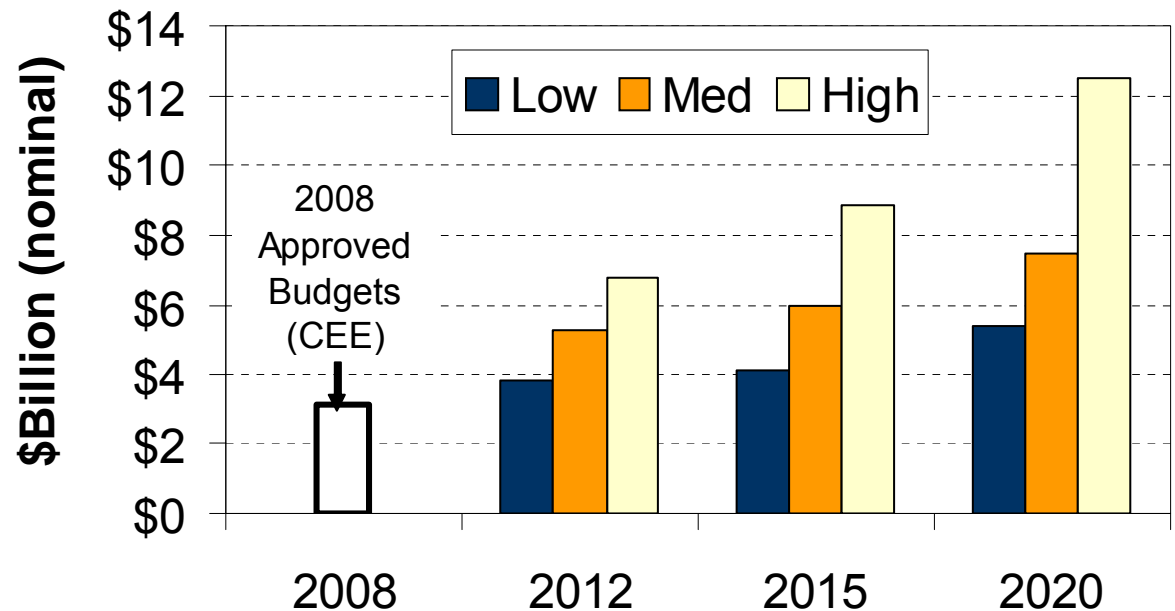
## Approach

- **Leading** and **Up-and-Coming** states: scenarios reflect state- or region-specific assumptions about how effectively and aggressively EE policies currently in place (or under consideration) are implemented
- **Uncommitted** states: standardized scenarios are used; specified in terms of spending level (as % of revenues) by particular years (e.g., High Case is 0.8% of revenues by 2020)
- LBNL projections do not account for ARRA funding or other “non-traditional” sources (e.g., emission allowance auction revenues, capacity markets)

# LBNL Projects Substantial Increases in Ratepayer-Funded EE by 2020 in Medium & High Scenarios

- EE funding projected at \$7.4 and \$12.4B by 2020 in Medium and High case (2.5 to 4 times higher than 2008)
- Spending projected to increase ~7.5% to 12% per year in Medium and High Cases

**Projected Ratepayer-Funding for EE**



- Spending as % of revenue from retail electric and gas sales increases to 1.1% in Medium Case, 1.8% in High Case (compared to 0.6% in 2008)

# EE Funding is also Likely to Become Much More Evenly Distributed Across U.S.

- **Populous states with historically low EE funding but aggressive new EEPS policies (IL, MI, NC, OH, PA) emerge as major new markets**
- **CA ratepayer-funding projected to stay flat**
- **Other states with historically large budgets (NY, NJ, MA) are likely to expand funding and close the gap with CA**
- **A much greater portion of total U.S. funding is likely to occur outside of the top-10 markets by 2020 (i.e., 42-45%, compared to 22% today)**

**Top-10 Energy Efficiency Markets in 2020**

Rank	2008 Budget (\$M, nominal)		2020 Spending Projections			
			Medium (\$M, nominal)		High (\$M, nominal)	
1	CA	1,014	NY	808	CA	1,312
2	NY	288	CA	538	NY	1,094
3	NJ	196	MA	477	TX	882
4	WA	179	IL	449	IL	805
5	MA	149	NJ	424	MA	630
6	WI	140	OH	375	OH	595
7	MN	137	NC	283	WI	575
8	FL	124	PA	274	NJ	504
9	CT	114	WI	270	PA	467
10	TX	106	MI	265	MN	413
Top-10 (\$M)		2,447	4,164		7,277	
% of U.S.		78%	55%		58%	
Other States (\$M)		686	3,342		5,247	
% of U.S.		22%	45%		42%	

# Many States Are Expected to See Funding Increases of >\$200-300M by 2020

- Some of the largest funding increases are expected in populous “up-and-comers” (IL, MD, MI, NC, OH, PA)
- Large funding increases (i.e., >\$200M) also projected under Med/High scenarios for many leading states

**States with Largest Projected Funding Increase (2008-2020)**

Rank	Medium Case (\$M, nominal)			High Case (\$M, nominal)		
	State	2008 Budget	2008-2020 Increase	State	2008 Budget	2008-2020 Increase
1	NY	288	520	NY	288	806
2	IL	41	408	TX	106	775
3	MA	149	328	IL	41	764
4	OH	58	317	OH	58	537
5	NC	0	283	MA	149	481
6	PA	0	274	PA	0	467
7	MI	20	245	WI	140	435
8	NJ	196	228	MD	6	348
9	MD	6	184	NC	0	324
10	CO	26	154	MI	20	313
Top-10 Total		784	2,942		808	5,250
Other States		2,348	1,431		2,324	4,062



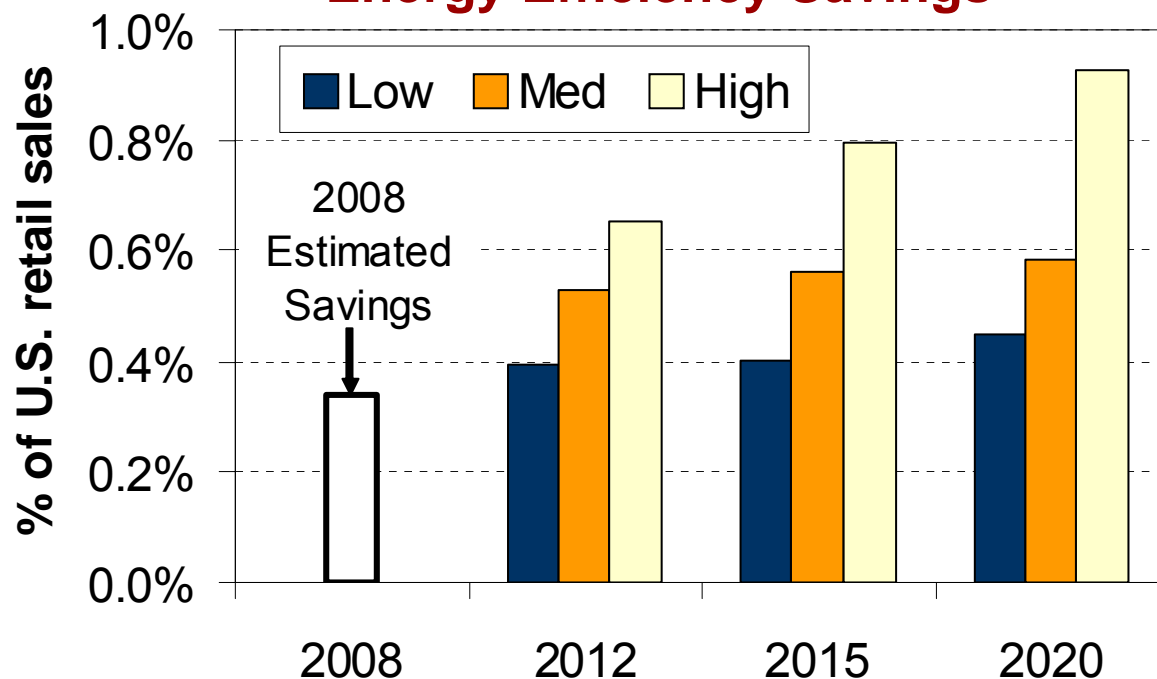
# Electricity Savings from Ratepayer-Funded Programs Projected to Grow Substantially

- **2008 U.S. annual electricity savings = 0.34% of retail sales**
  - Some leading states achieved savings >1% (VT reports 2.5%)

- **Annual electricity savings projected to rise to 0.58%-0.93% of retail sales by 2020 in Medium and High Cases**

- **Cumulative savings by 2020 equal 4.7%-8.6% of EIA's reference case forecast of 2020 retail electricity sales (6.1% in Medium Case)**

## Projected Incremental Annual Electric Energy Efficiency Savings



# State-Level EE Policies Could Meet a Sizable Portion of a Federal Electric EERS

- LBNL compared state EE projections with a generic national electric EEPS policy (resembling recent proposals):
- Considered three alternative EERS targets: cumulative savings in 2020 equal to 5%, 10%, and 15% of 2020 retail electricity sales
- LBNL assumed that 50% of EERS target is met through other EE strategies (e.g., codes & standards, CHP)
- In 2020, a 5% EERS would require little or no increase in aggregate savings from ratepayer funded-programs (relative to LBNL projections)
- A 15% EERS would require at least a moderate aggregate increase

## Projected Increase in Ratepayer-Funded EE Program Savings Under a National EERS

National EEPS Saving Target: <i>Cumulative Savings in 2020 as a Percent of Retail Sales</i>	% Increase in EE Program Savings (Relative to No National EEPS)
5%	<b>0% - 12%</b>
10%	<b>8% - 37%</b>
15%	<b>18% - 68%</b>

# Projected Savings Would Contribute Modestly to a Federal Cap-and-Trade System

- Projected savings from ratepayer-funded electric EE programs implemented in 2010-2020 would yield emission reductions of 69-125 mmtCO<sub>2</sub>e (Low Case) or 117-211 mmtCO<sub>2</sub>e (High Case) in 2020
  - Based on back-of-the-envelope analysis
  - Range for each case reflects uncertainty in marginal generator emission rate
- As an example of the potential emission reductions required under a federal cap-and-trade (i.e., not an endorsement or prediction)...
- EPA projects that *The American Clean Energy and Security Act of 2009* (the Waxman-Markey bill) would require emission reductions of approximately 900 mmtCO<sub>2</sub>e by 2020.
- LBNL's projection of emission reductions from ratepayer-funded EE programs represents 5-18% of the total required emission reduction
  - Under the assumption that EPA reference case includes business-as-usual ratepayer funded EE program savings (equal to 50% of 2008 savings)

# Key Challenges to Dramatically Scaling Up Ratepayer-Funded EE over the Next Decade

---

- **The economic downturn**
- **General aversion to short-term rate impacts**
- **Coordination with state/federal energy efficiency programs (e.g. ARRA)**
- **Developing new program designs that reach deeper and broader savings**
- **Effect of new state and/or Federal appliance and lighting efficiency standards on remaining mkt. potential**
- **Developing institutional framework**
- **Shortage of trained personnel**



# For More Information...

---

## **Download the Report:**

**<http://eetd.lbl.gov/ea/emp/ee-pubs.html>**

## **Contact the Authors:**

**Galen Barbose ([gbarbose@lbl.gov](mailto:gbarbose@lbl.gov)) (510) 495-2593**

**Chuck Goldman ([cagoldman@lbl.gov](mailto:cagoldman@lbl.gov)) (510) 486-4637**

**Jeff Schlegel ([SchlegelJ@aol.com](mailto:SchlegelJ@aol.com))**

# Extra/Alternative Slides

---



# Traditionally Leading States Are Poised to Redouble Their Efforts

---

- **Roughly 15 states have maintained relatively significant ratepayer-funded EE programs over the past 5-10 yrs**
  - E.g., electric EE budgets  $\geq 1\%$  of revenues from retail electricity sales
  - Located primarily in the Northeast, West, and upper Midwest
- **Many leading states have recently made or are considering commitments to substantially expand existing efforts:**
  - New EEPS policies adopted or under consideration in NY, WI, NJ
  - Statutory requirements that utilities acquire all (achievable) cost-effective EE adopted in CA, CT, MA, RI, WA
  - Aggressive EE acquisition schedules proposed in recent IRPs of Western utilities, reflecting cost/risk advantages

# EE Will Remain Central to California Energy Policy but Ratepayer-Funding May Decline

- **A multitude of policies will provide continued support for EE**
  - E.g., AB32, state loading order, statutory requirements to acquire all cost-effective EE, resource planning requirements
- **In 2008, the CPUC adopted the California Long-Term Energy Efficiency Strategic Plan**
  - Provides a 10-yr roadmap for scaling up the state's EE efforts
  - Sets ambitious market transformation goals (e.g., achieving zero net energy in all new residential construction by 2020)
- **CPUC also recently adopted interim 2012-2020 savings goals that suggest a steep decline in savings from IOU EE programs**
  - Goals based updated market potential study that accounts for saturation of key measures (e.g., residential lighting) and new state/Federal appliance efficiency standards





# Substantial Funding Increases Are Expected in a Number of “Up-and-Coming” States

- **Commitments to significantly ramp-up EE programs have been made in a large number of states that, historically, have provided modest or little ratepayer-funding**
  - Much of this activity is centered within the Mid-Atlantic, Midwest, and Southwest
- **New EEPS (or similar) policies have recently been adopted in CO, IL, MD, MI, NC, NM, OH, and PA**
  - Many states' targets rise to 1-2% of retail sales per year, rivaling the savings currently achieved in only a handful of leading states
  - EE program planning efforts just getting underway in many of these states
- **IRP or DSM planning processes are driving significantly higher EE funding levels in AZ, CO, NM, NV**

# Many States Have Not Made Significant Commitments to Ratepayer-Funded EE

- **Approximately 20 states have no current plans to provide significant ratepayer-funding for EE**
  - Located primarily in the Southeast and parts of Midwest
  - Funding is typically <0.1% of revenues, with program offerings typically limited to general information, customer audits, and/or pilot programs
- **Even in the absence of specific commitments, some modest increase in EE funding may occur in the face of escalating generation costs and risks associated with future carbon regulations**
- **Some utilities have expressed interest in implementing larger EE program portfolios, in many cases linking it to deployment of an advanced metering infrastructure (AMI) or construction of new baseload generation**
- **Utilities and PUCs in a few states are considering moderate expansions to their EE efforts (in some cases contingent on developing an attractive business model for the utility), but have not yet made significant commitments**