



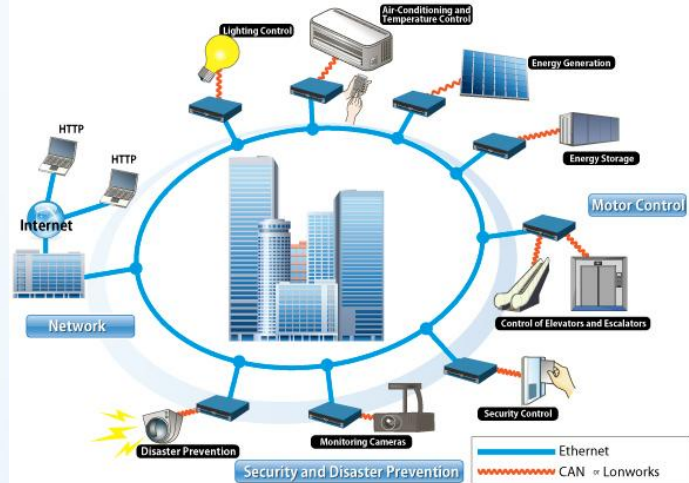
American Council for an Energy-Efficient Economy

Energy Efficiency and Demand Response Opportunities

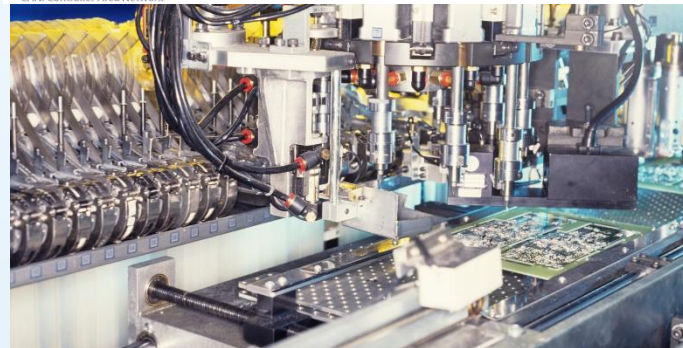
Steven Nadel, Executive Director

Presentation to NARUC ERE Committee

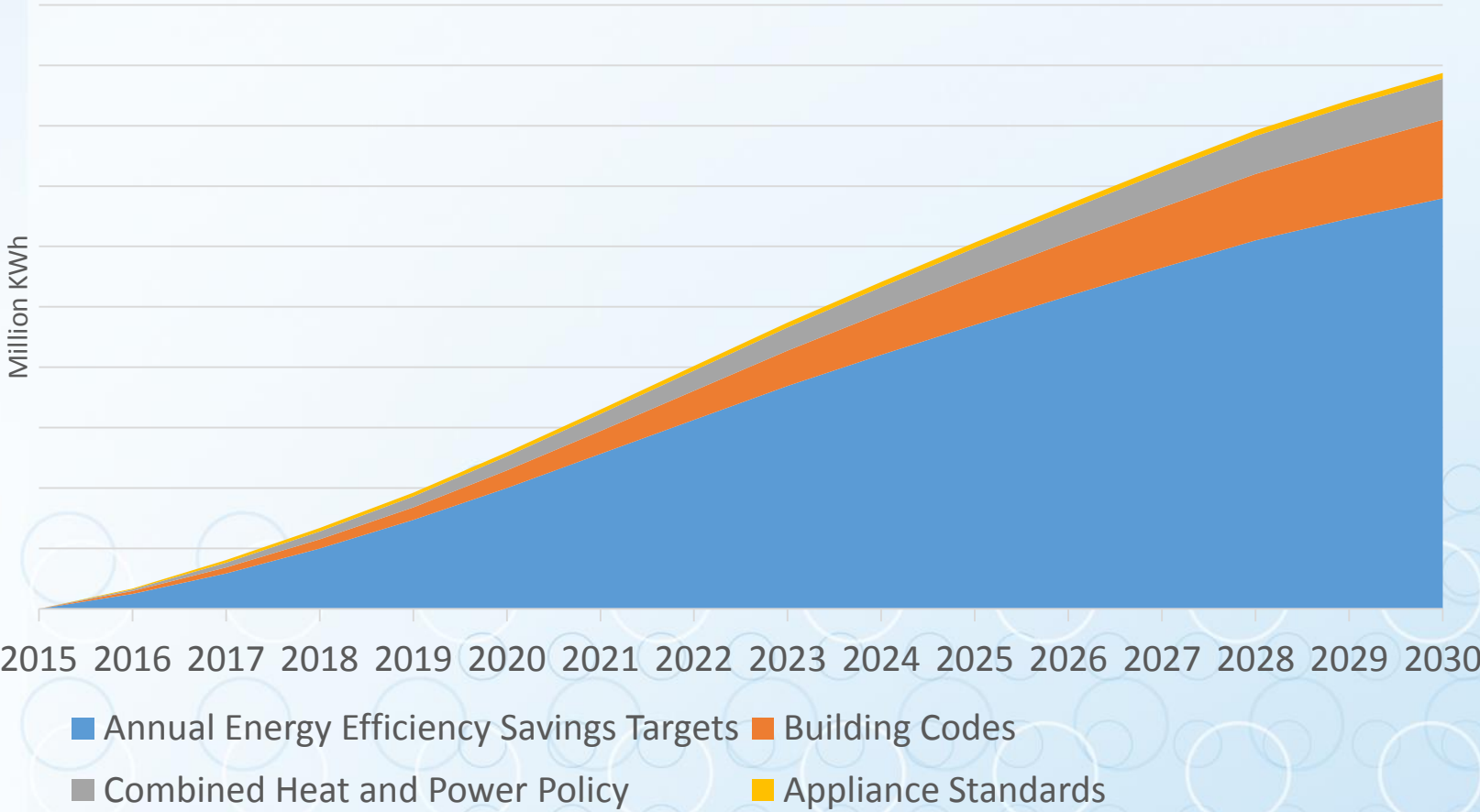
Feb. 17, 2015



CAN: Controller Area Network



Potential Energy Savings from EE Policies in 51 States



Results in Perspective

- Savings in 2030 are a 25% reduction relative to 2012 consumption (varies from 22-30% by region)
- 247 GW of avoided capacity
- Net savings of \$48 billion
 - Efficiency investments required to generate 2030 savings: \$47 billion
 - Retail price of avoided electricity: \$95 billion
- Economic impacts
 - \$17.2 billion increase in GDP in 2030
 - 611,000 jobs in 2030

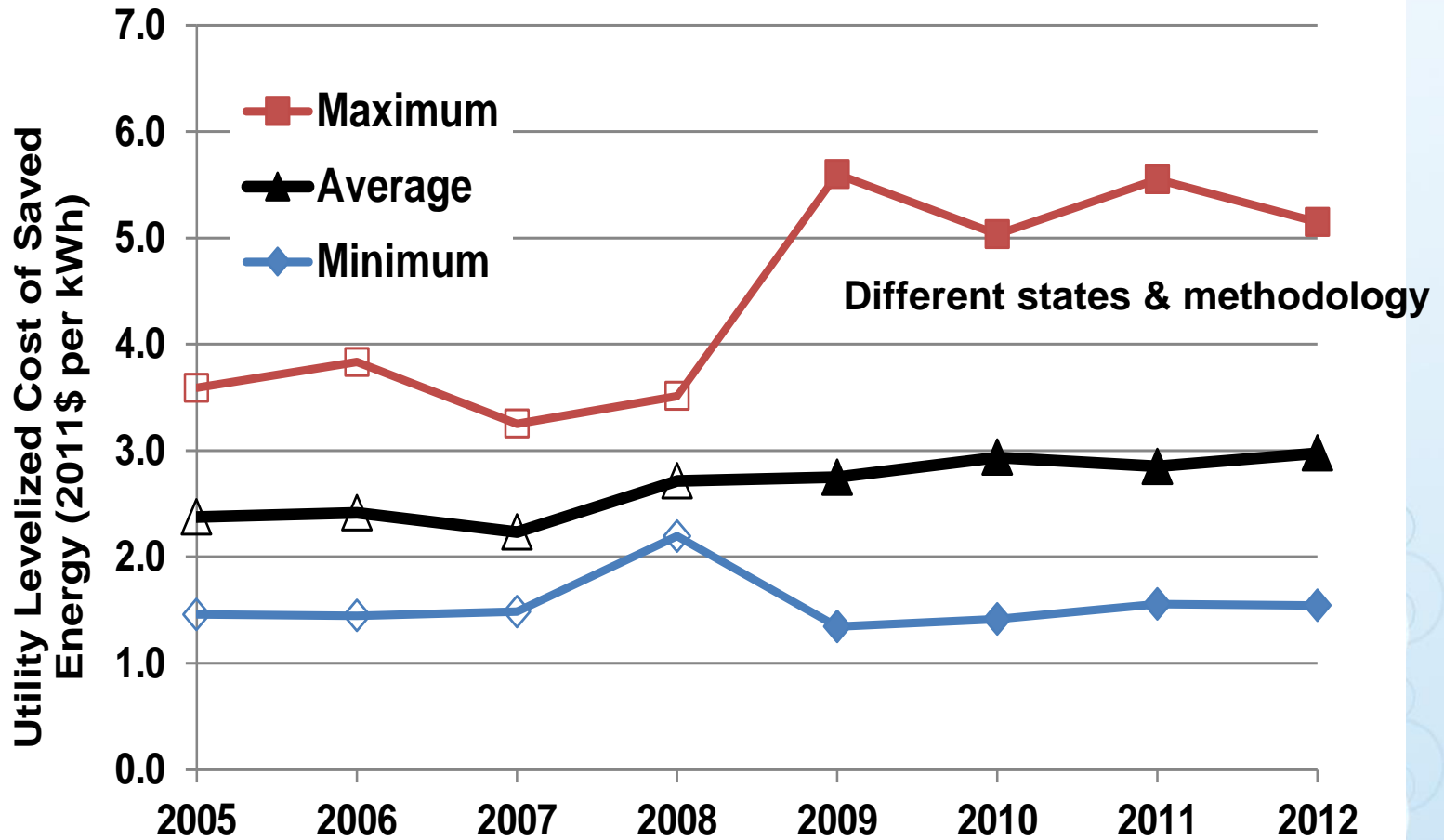


Estimates of 2013 Utility-Sector Program Savings

State	2013 net incremental savings (MWh)	% of retail sales
Rhode Island	161,831	2.09%
Massachusetts	1,116,442	2.05%
Vermont	99,074	1.78%
Arizona	1,317,329	1.74%
Hawaii	159,056	1.67%
Michigan	1,284,863	1.51%
Oregon	676,046	1.43%
Washington	990,143	1.35%
California	3,223,733*	1.25%

* 2012 data; 2013 data not yet available

Cost Trends by Year



ACEEE “Next Big Things” Study

1. Appliances & standards (RF, CW, CD)
2. New construction programs & codes
3. Very efficient packaged AC for residential & commercial
4. Smart manufacturing and buildings
5. Strategic energy mgmnt for large C&I
6. Combined heat & power
7. Reduce key plug loads
8. Advanced lighting design & controls
9. Real-time feedback & advanced thermostats
10. Whole building retrofits
11. Conservation voltage reduction
12. Advanced water heaters
13. Residential LEDs
14. Industrial fans, pumps & compressors



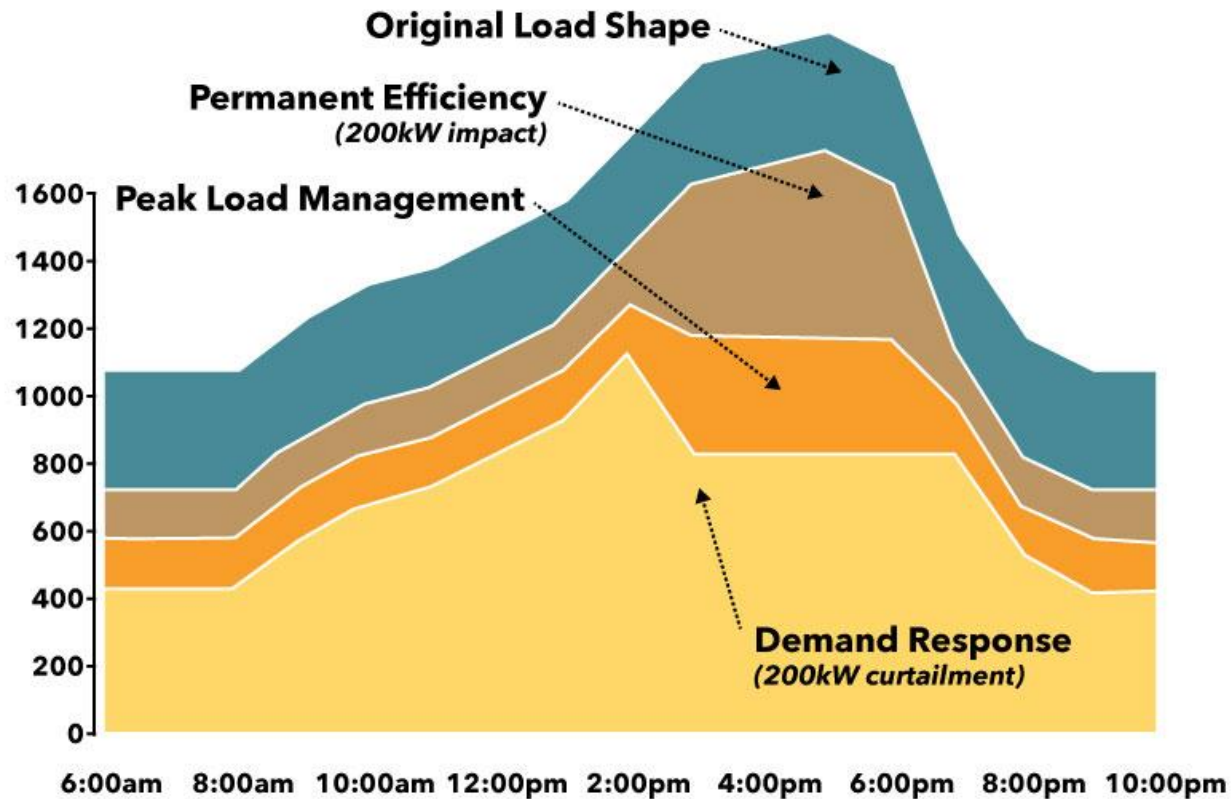
Intelligent Efficiency in Buildings

- Use data and sensors to identify problems, then solve them
- NRDC study of 3 ~Energy Star offices using OnSite achieved 13% average savings. Other vendors report similar results



	Square Feet	2012 Occupancy	KWH Used		Study Period Savings	
			2011	2012	%	\$
1707	109,926	302	1,965,135	1,516,274	23%	\$ 58,352
1828	332,928	928	5,590,937	5,227,183	7%	\$ 47,288
1909	239,128	462	5,197,305	4,327,589	17%	\$ 113,063
Total			12,753,377	11,071,046	13.2%	\$ 218,703

Energy Efficiency and Demand Response Can Be Synergistic



Energy Efficiency and Demand Response

- Can market both EE and DR programs together – joint promotions, same account representative
- Some new technologies do both EE & DR
 - Smart building controls
 - Smart thermostats
 - Smart manufacturing systems
 - Electric vehicles with smart charging



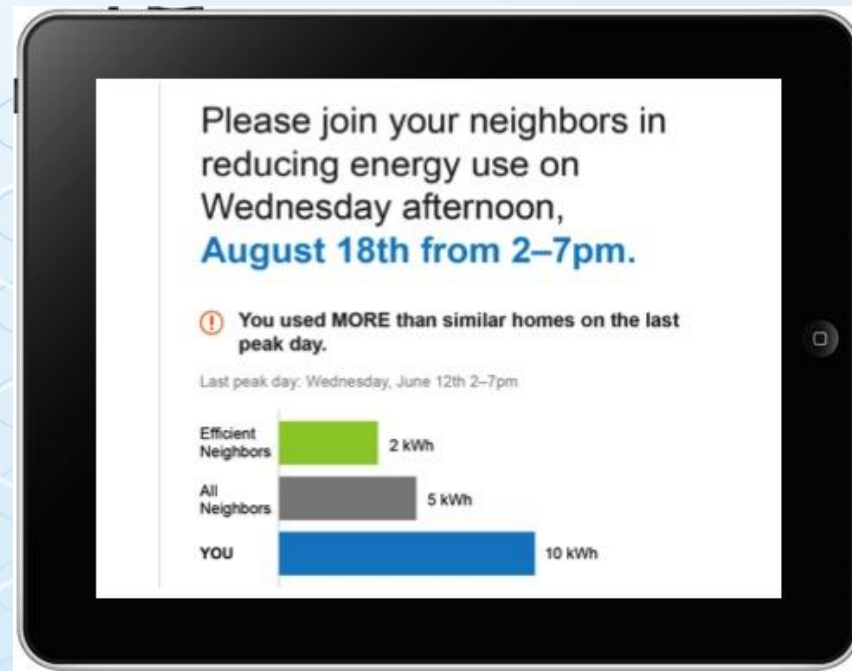
Smart Thermostats: Preliminary Results



	Percent Savings				
	Heat	Cool	Space Condi- tioning	All Elec.	Elec. kW
ETO heat pumps	12%			4.7%	
PG&E HAN					5.6%
Cadmus (U.S.)	4.5%	19.5%	6.6%		
Vassar (So. CA)				6%	highest 2-6pm
Vectren	12.5%	13.9%			
Nest/MyEnergy	9.6%	17.5%			

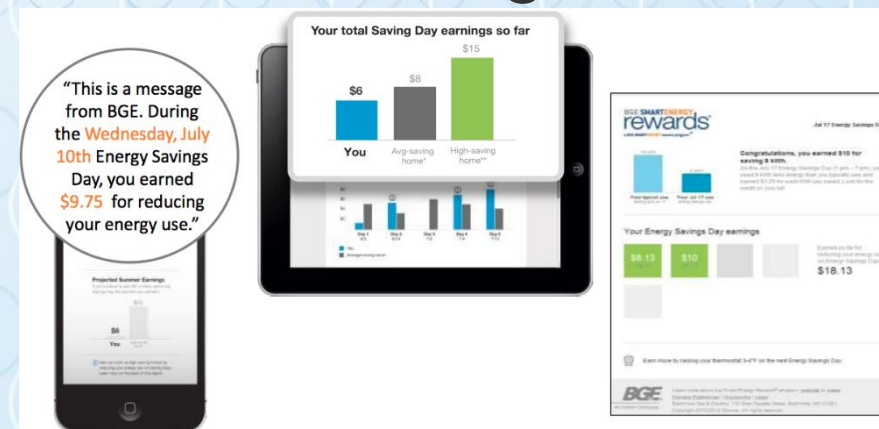
Behavioral Efficiency & Demand Response

- Many analyses find 2% average kWh savings from monthly bill reports
- OPower reports 3% average kW savings with a behavioral-only demand response program



BG&E Smart Energy Rewards

- Bill credit of \$1.25/kWh saved; 5-10 peak days
- Notifications via customer's preferred channel
- In 2013 pilot, 75-93% of customers earned a credit, averaged \$8-11/ event
- Reduced peak load by average of 5% with behavior; 23% for customers who agree to direct load control





Evaluation, Measurement & Verification (EM&V)

1. Build on established methods such as explained in SEE Action guides
2. Measure savings relative to business-as-usual baseline; do not worry about attributing savings to utility programs vs. other interventions (“adjusted gross savings”/ “net savings lite”)
3. Deemed savings okay but need to periodically revise these estimates based on impact evaluations, esp. for programs with large savings

Conclusions



- Large efficiency savings still available – so far “the fruit grows back on the tree”
- Demand response adds significant additional savings as well as synergies
- New technology and marketing opportunities to do EE and DR together
- EM&V needs to be good but not perfect (e.g. concentrate on the largest savings)

Contact Information

Steven Nadel

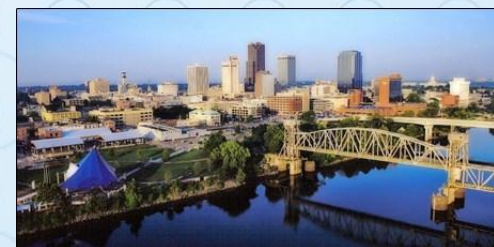
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2015 ACEEE Conferences

- Hot Water Forum, Feb. 22-24, Nashville
- Market Transformation Symposium, April 20-22, Washington, DC
- Energy Efficiency Finance Forum, May 31-June 2, San Francisco
- Industrial Summer Study, August 4-6, Buffalo, NY
- **Energy Efficiency as a Resource, Sept. 20-22, Little Rock, AR**
- Behavior, Energy and Climate Change Oct. 18-21, Sacramento
- Intelligent Efficiency – Dec. 6-8, Boston



Intelligent Efficiency:
Innovations Reshaping the
Energy Efficiency Market

