



INSTITUTE FOR
Electric Efficiency



Global Energy Partners, LLC
An Employee-Owned Company

Impacts of Future Codes and Standards on U.S. Electricity Use (2010-2020)

Prepared for
ACEEE Energy Efficiency as a Resource

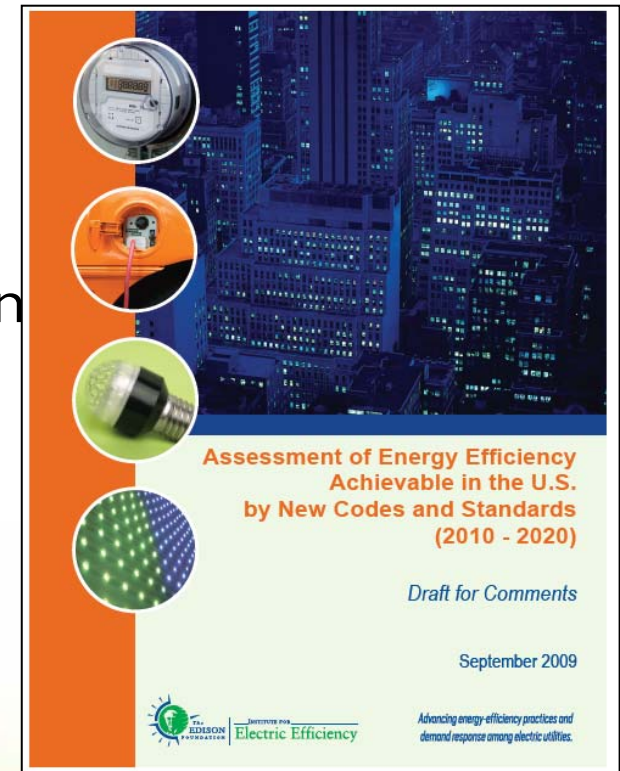
Presented by
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September 29, 2009

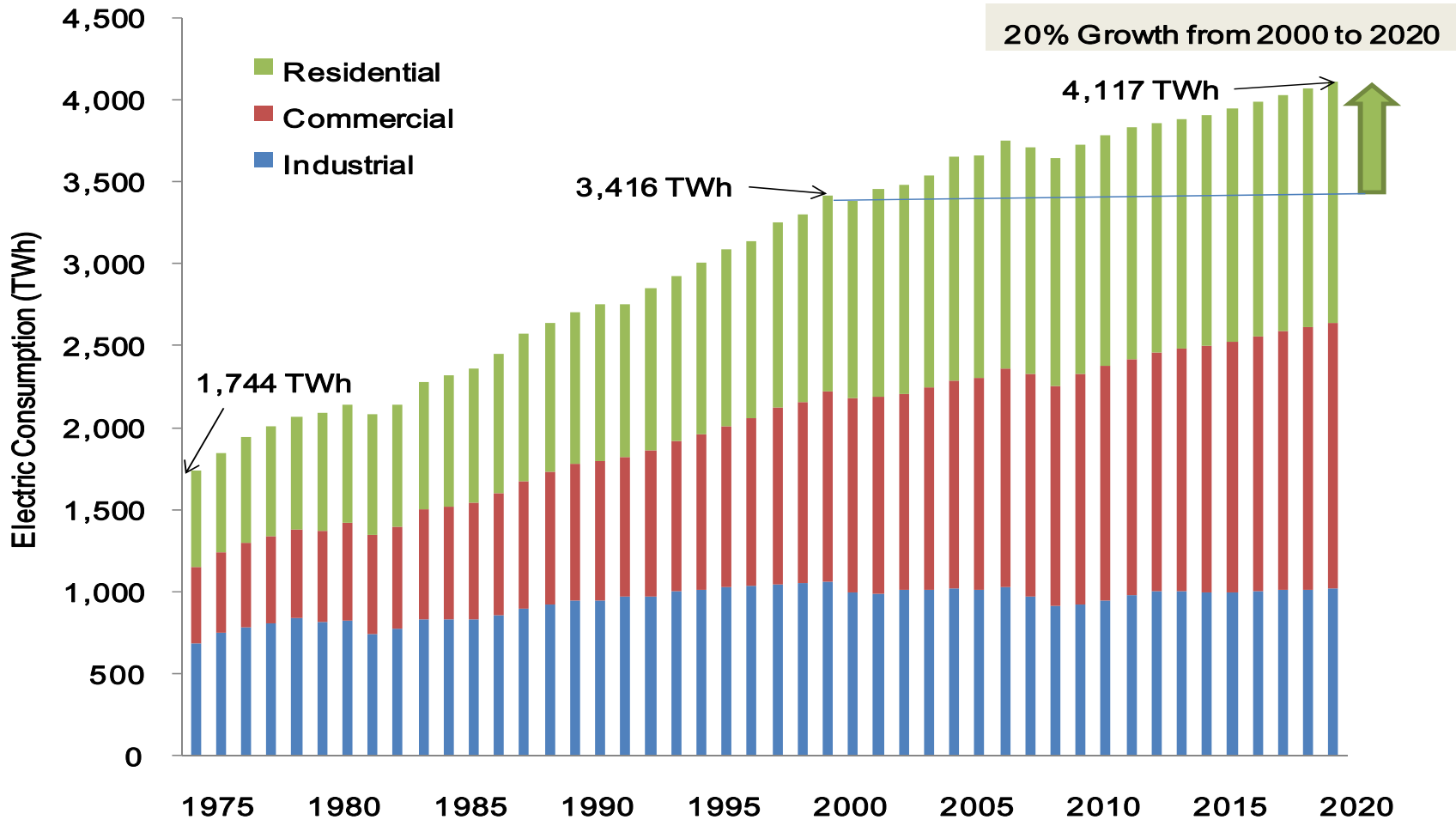
Background

- The Institute for Electric Efficiency (IEE) sponsored this research – Lisa Wood, Executive Director
- Objectives
 - Quantify potential impacts of future codes and standards
 - Engage utilities in dialog and identify ways for them to get involved in the regulatory process
- A draft whitepaper:
is available on the IEE website:

<http://www.edisonfoundation.net/iee/>



U.S. Electricity Use – Past and Future



DRAFT RESULTS

Assumptions in the Baseline Forecast¹

- Existing codes and standards
 - Both local and federal building codes (i.e., IECC 2006 and 2009; ASHRAE 90.1 2004 and 2007)
 - Appliance and equipment standards officially signed
 - Other energy-relevant legislation
- Naturally occurring efficiency
 - Technological improvements
 - Conservation response to rising prices
 - Market trends towards “green”
- Embedded demand-side management
 - Utility information and incentive programs
 - State funding and regulatory mechanisms
 - New funding through the ARRA

¹Source: *Annual Energy Outlook 2009* with Provisions of the American Recovery and Reinvestment Act, April 2009

Codes and Standards Analyzed

1. Compliant – No Legislation

- All states have equivalent of IECC 2009 or ASHRAE 90.1 2007 building codes
- Equipment standards for items scheduled or overdue under DOE rulemaking process

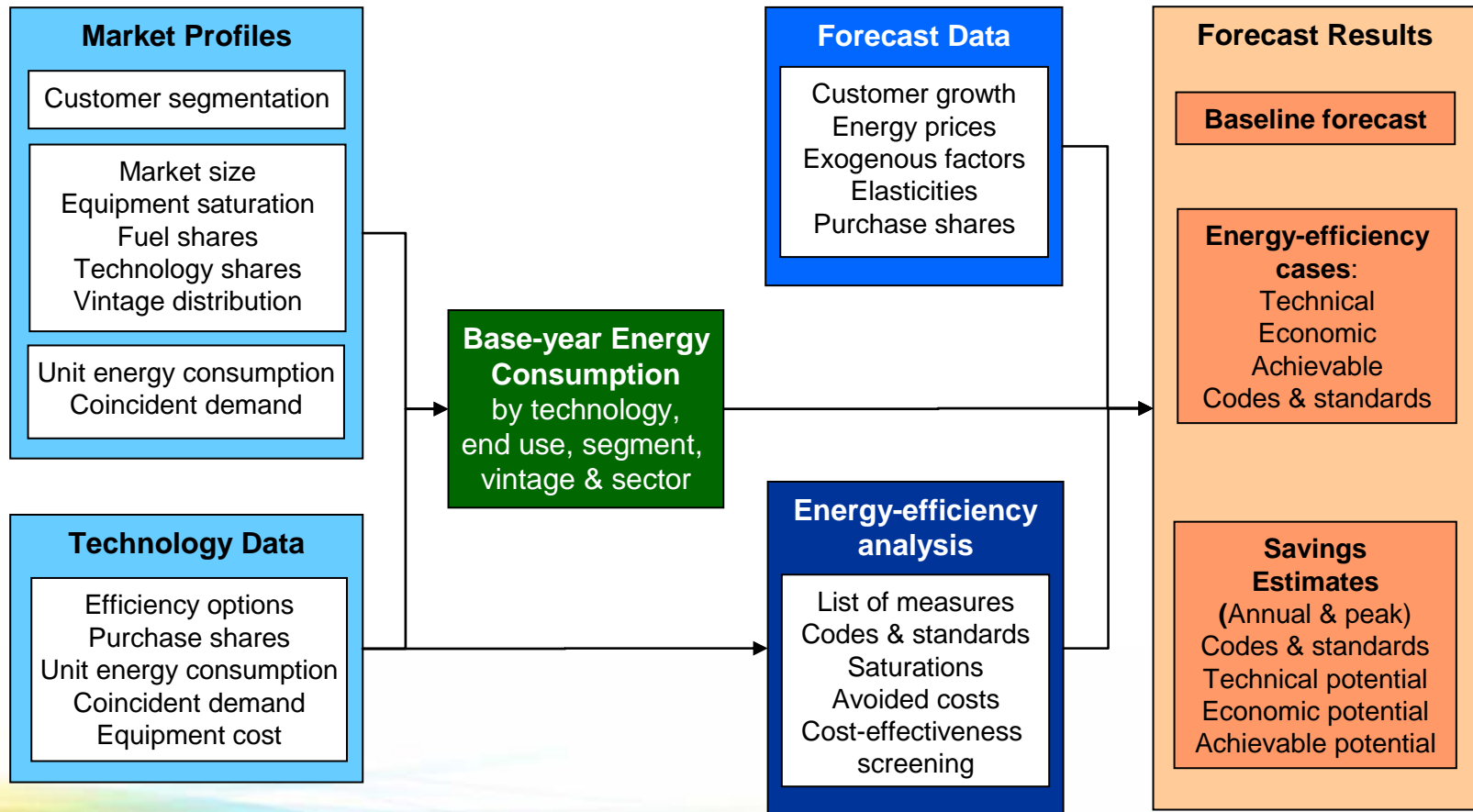
2. Partially Compliant – Legislation

- Building codes consistent with current version of Waxman-Markey Bill (HR2454, Sec. 201)
- Equipment standards expand to all possible devices; second standards in later years of the forecast for some technologies

3. Compliant - Legislation

- Same as #2 but with 100% compliance

Used LoadMAP™ to Perform Analysis

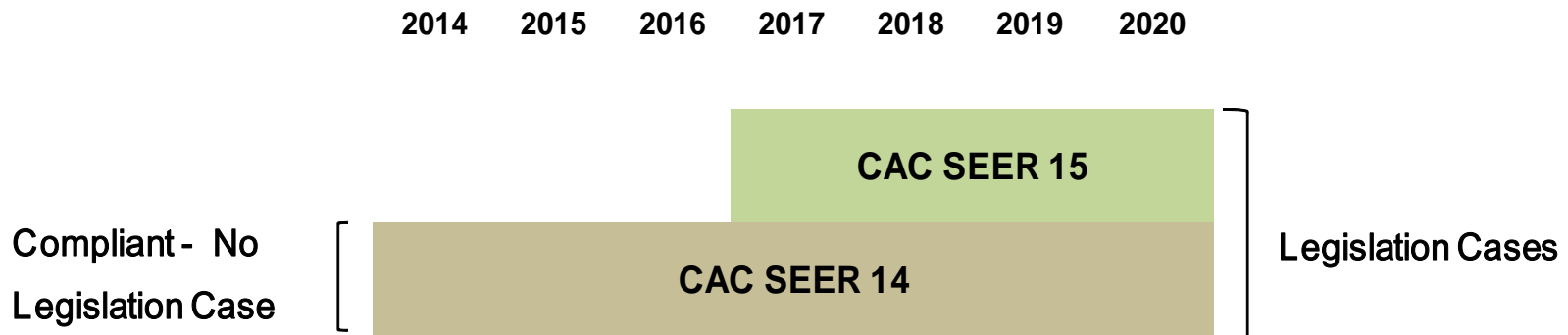


Building Code Assumptions

Average Energy Reductions (% of Baseline Usage)

	Compliant - No Legislation IECC 2009	Partially Compliant - Legislation Compliant - Legislation Waxman-Markey I	Waxman-Markey II
Year Effective	2010	2010	2014-2015
Residential Sector	15%	30%	50%
Commercial Sector	15%	30%	50%
Industrial Sector	6%	11%	19%

Equipment Standards Assumptions - Residential CAC Example



Residential Standards Assumptions

Technology	2012	2013	2014	2015	2016	2017	2018	2019	2020
Central AC				SEER 14			SEER 15		
Window AC				EER 10.8			EER 11.5		
Heat Pump				HSPF 8.2			HSPF 9.3		
Water Heating				EF 0.95			Ht Pump WH		
Interior Screw-in			Advanced Incandescent				CFL		
Exterior Screw-in			Advanced Incandescent				CFL		
Reflector Lamps				Advanced Incandescent			CFL		
Torchiere				Advanced Incandescent			CFL		
Linear Fluorescent							Super T8		
Refrigerator			2010 Code			2014 Code			
Freezer							Energy Star		
Dishwasher							Energy Star		
Clothes Washer				MEF 2.0					
Clothes Dryer				Moisture Sensor (10%)			15% More Efficient		
Cooking							13% More Efficient		
Personal Computer							Energy Star		
Color TV							Energy Star		
Furnace Fan				Permanent Magnetic Motor					

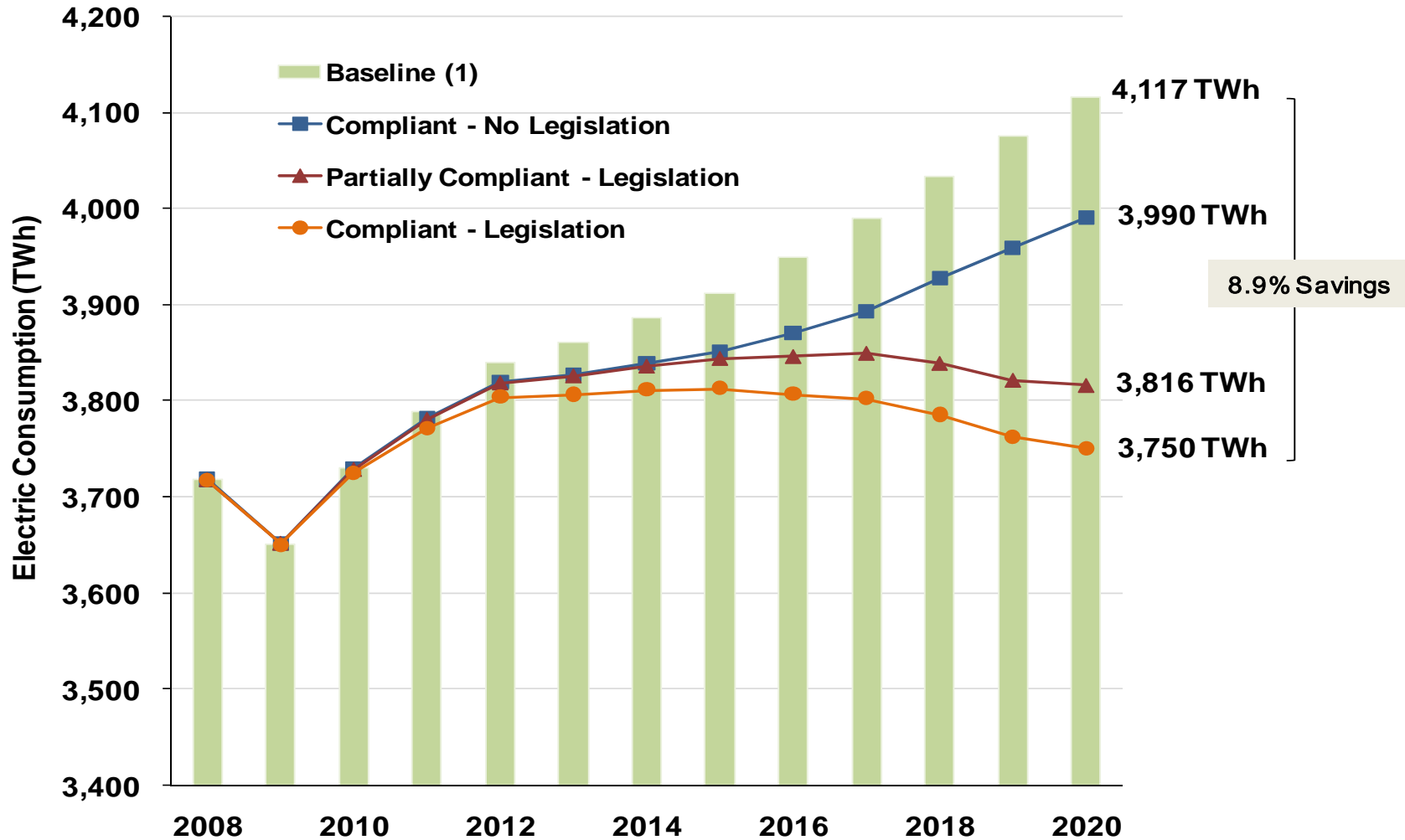
Compliant -
 No Legislation Case

 Legislation Cases

Summary of Impacts in 2020

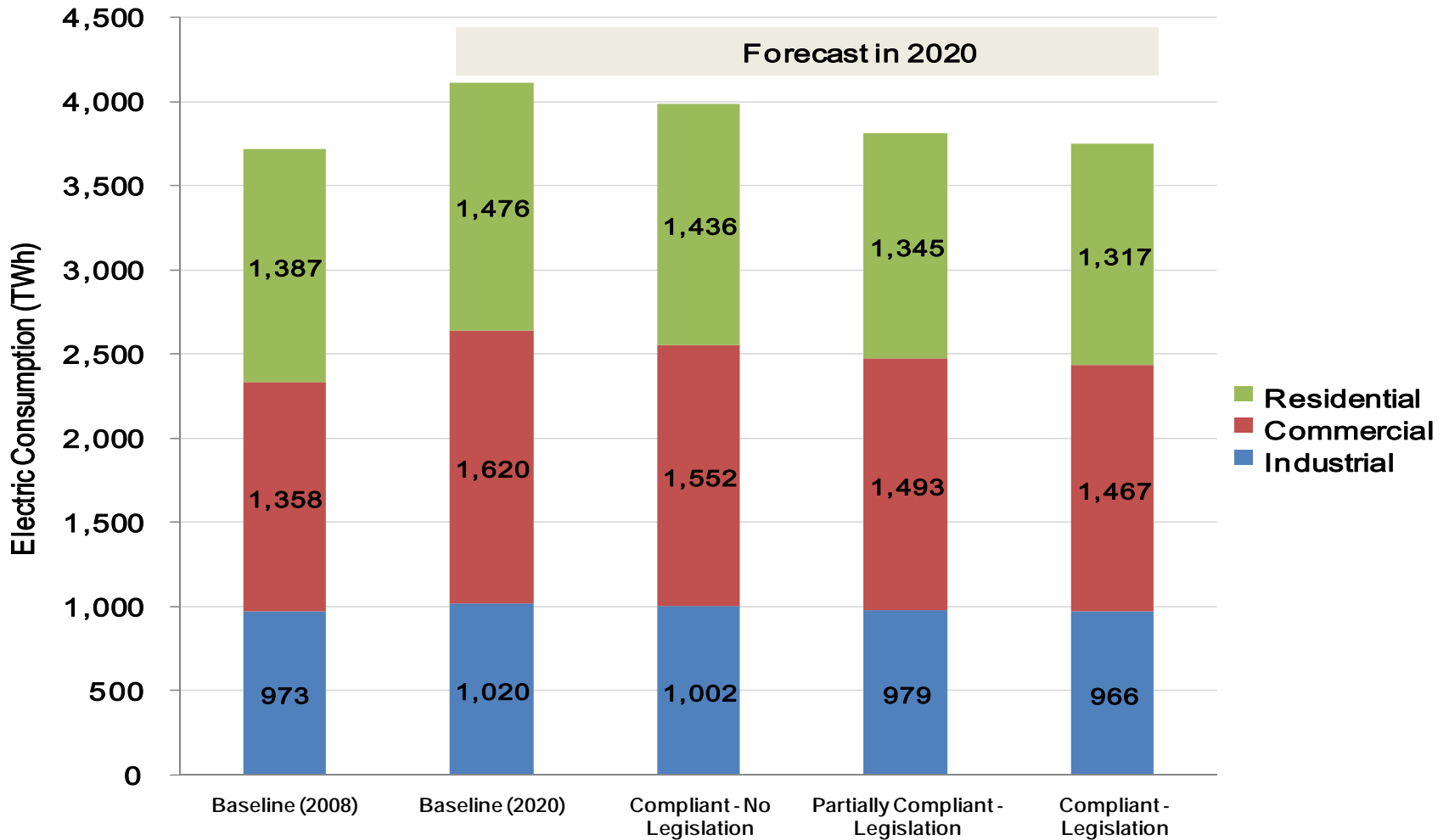
Scenario	Electricity Use in 2020 (TWh)	Savings from Codes (TWh)	Savings from Standards (TWh)	Total Savings in 2020 (TWh)	% of Baseline
AEO Baseline Forecast	4,117				
Compliant - No Legislation	3,990	49	78	127	3.1%
Partially Compliant - Legislation	3,816	87	214	301	7.3%
Compliant - Legislation	3,750	147	220	367	8.9%

Impact of Codes and Standards

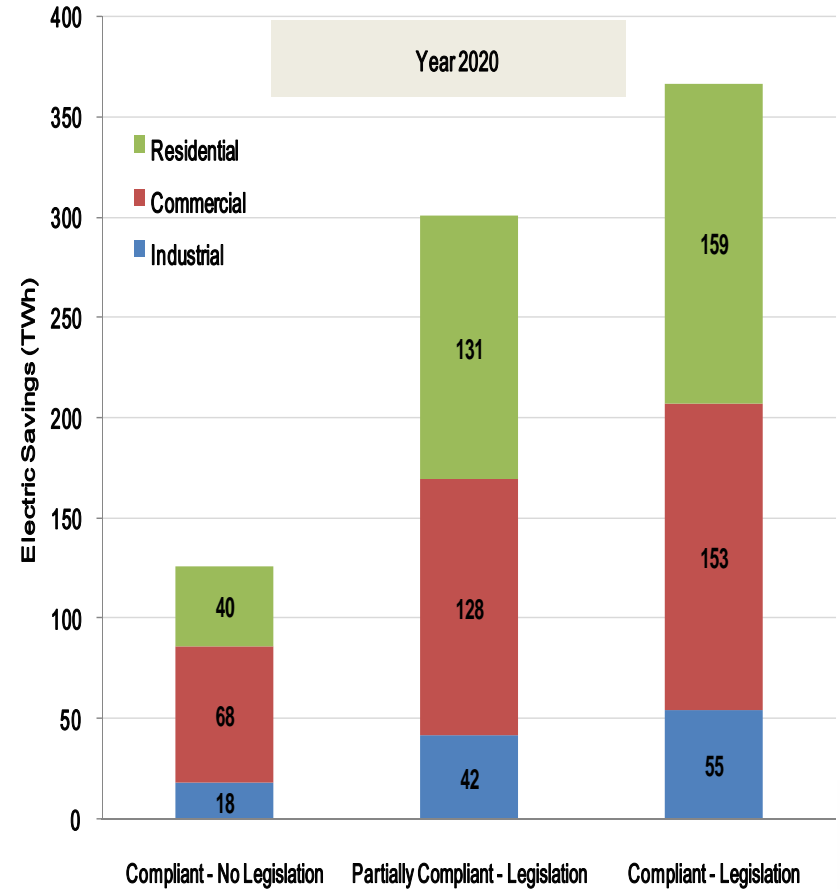
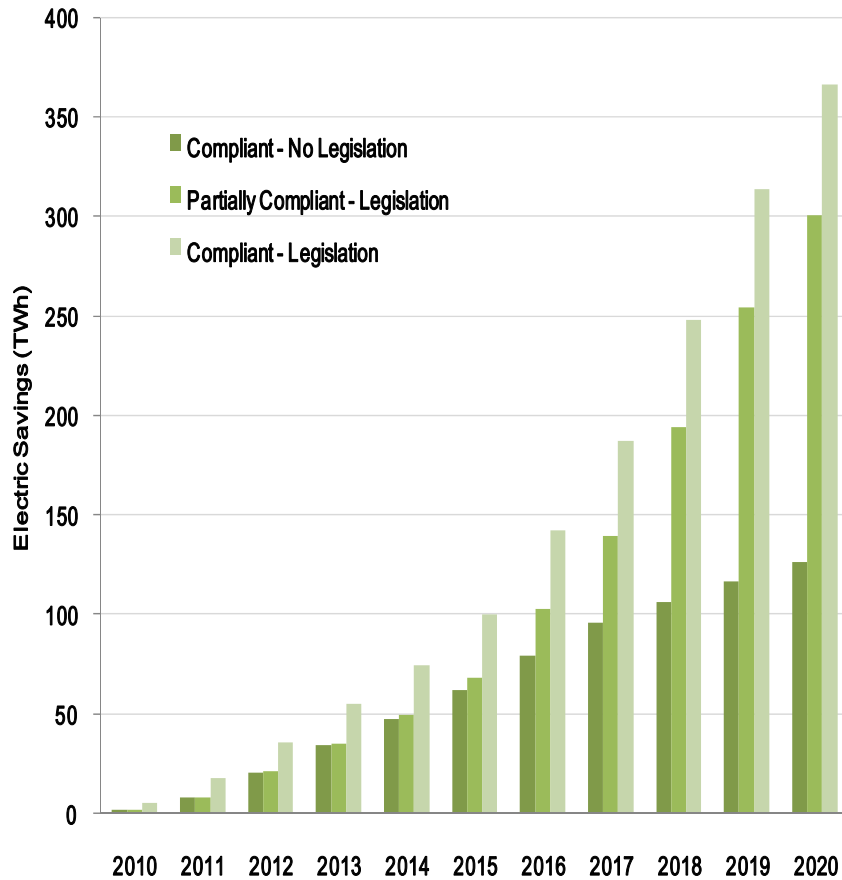


(1) Source: *Annual Energy Outlook 2009* with Provisions of the American Recovery and Reinvestment Act, April 2009

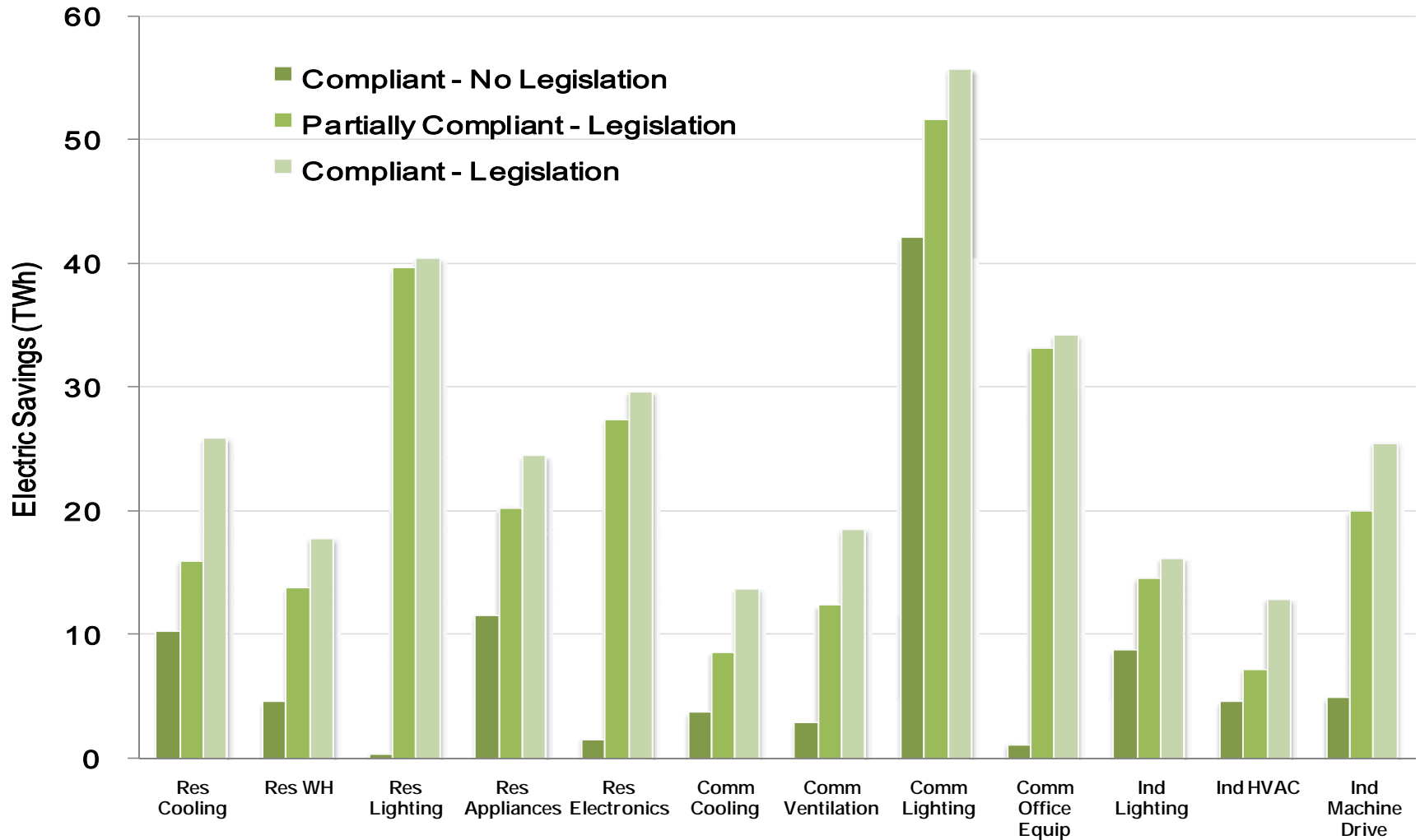
Forecast by Scenario and Sector



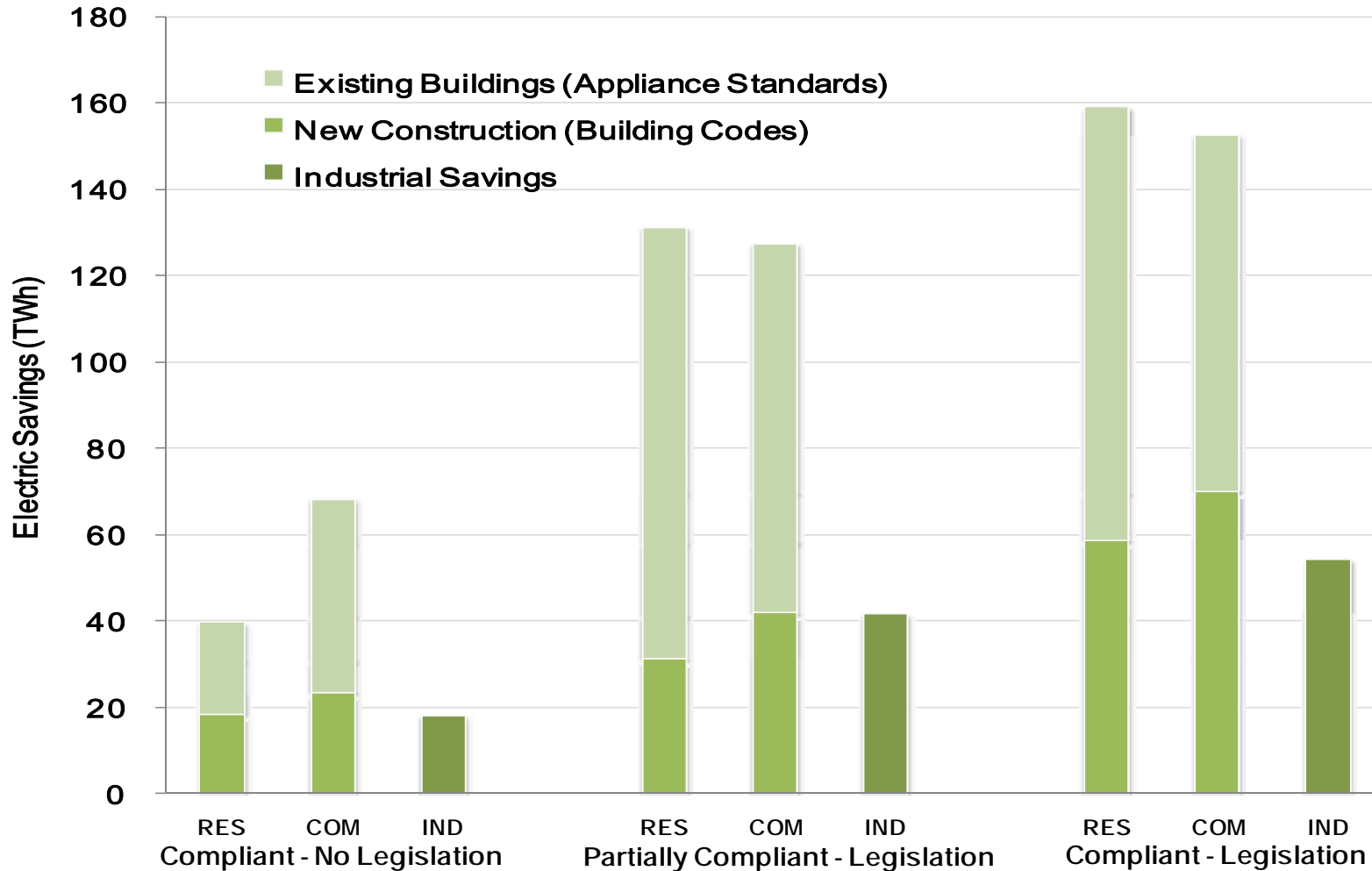
Savings by Scenario and Sector



2020 Savings by End Use

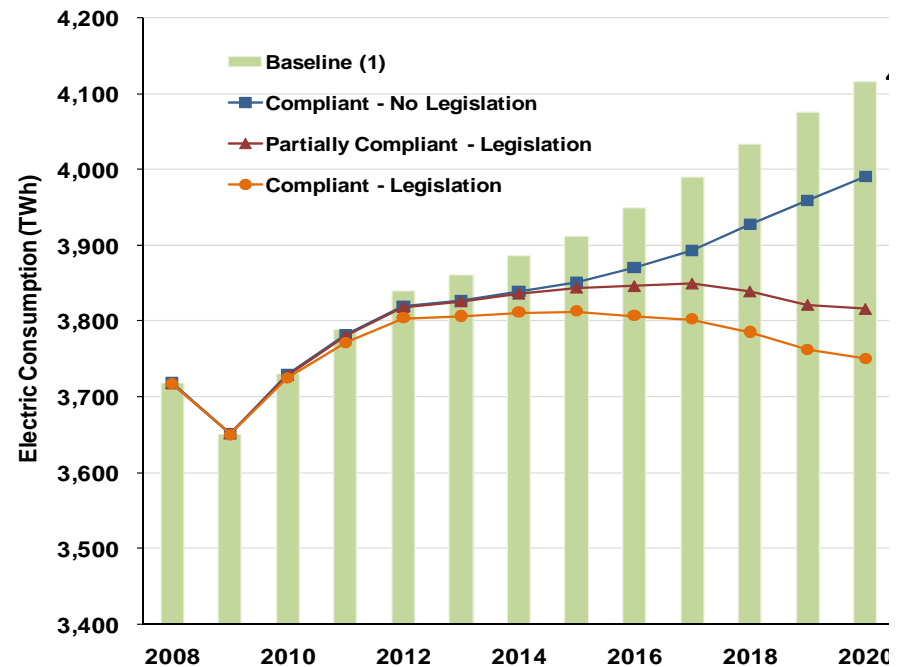


2020 Savings by Vintage and Sector



Implications

- By 2020, the analysis suggests that future codes and standards could
 - Reduce electricity use by **3-9%** of load in 2020
 - Offset growth in use since 2008 by **32-92%**
- This will affect savings possible from utility programs by
 - Lowering the baseline sales forecast
 - Raising the “efficiency bar”
- How could/should utilities respond?



Status and Next steps

- Draft white paper presented at EEI meeting in early September
 - Lively discussion about role of utilities
- Draft white paper in circulation
 - Numerous thoughtful comments received
 - EPA, ACEEE, DOE, NRDC, individual utilities
 - Additional comments are welcome
- Assess and incorporate comments in October
- Plan to release final in November 2009

For more information

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Draft white paper:
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