American Council for an Energy-Efficient Economy

Lessons Learned: Looking back and looking forward 31st Utility Energy Forum

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Asilomar Conference Center

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The American Council for an Energy Efficient Economy (ACEEE)

- Non-governmental organization (NGO) dedicated to advancing energy efficiency through research, education and advocacy.
- Celebrating 30th anniversary this year.
- Nearly 40 staff
- Known for conferences, research reports and as a major contributor to U.S. energy-efficiency legislation

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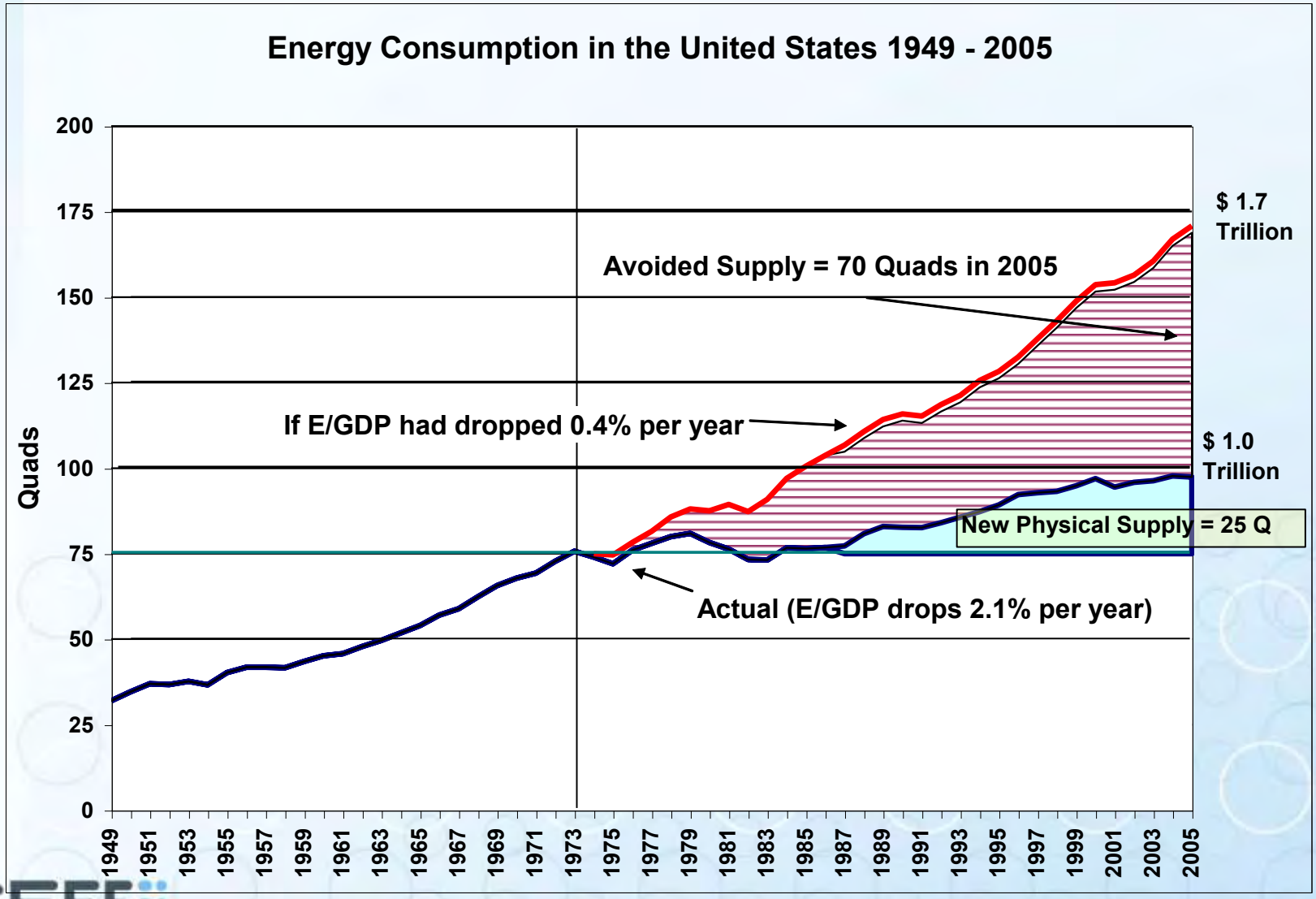
Goals Today

- EE: 40 years of cheap invisibility.
- The EE situation today
- Does EE have a future?
- Says who?

What is Energy Efficiency?

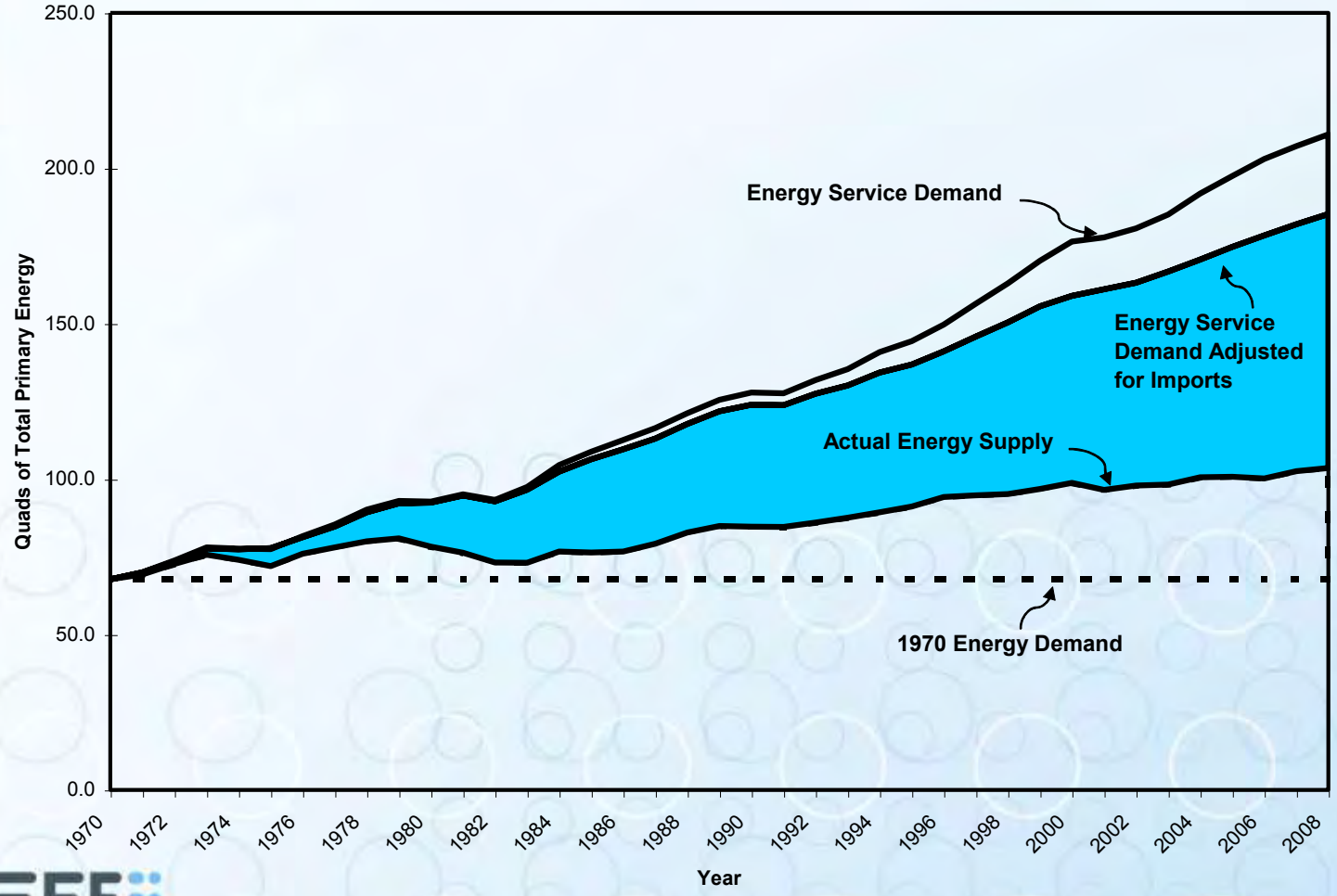
- EE is the provision of energy **service** (cold beer & hot shower) with less waste.
- EE is higher *energy productivity* – can approximate as more GDP/(bought)Btu.

Energy Efficiency's Past Success



Source: Art Rosenfeld, CEC

U.S. Energy Use in Relation to GDP 1970-2008



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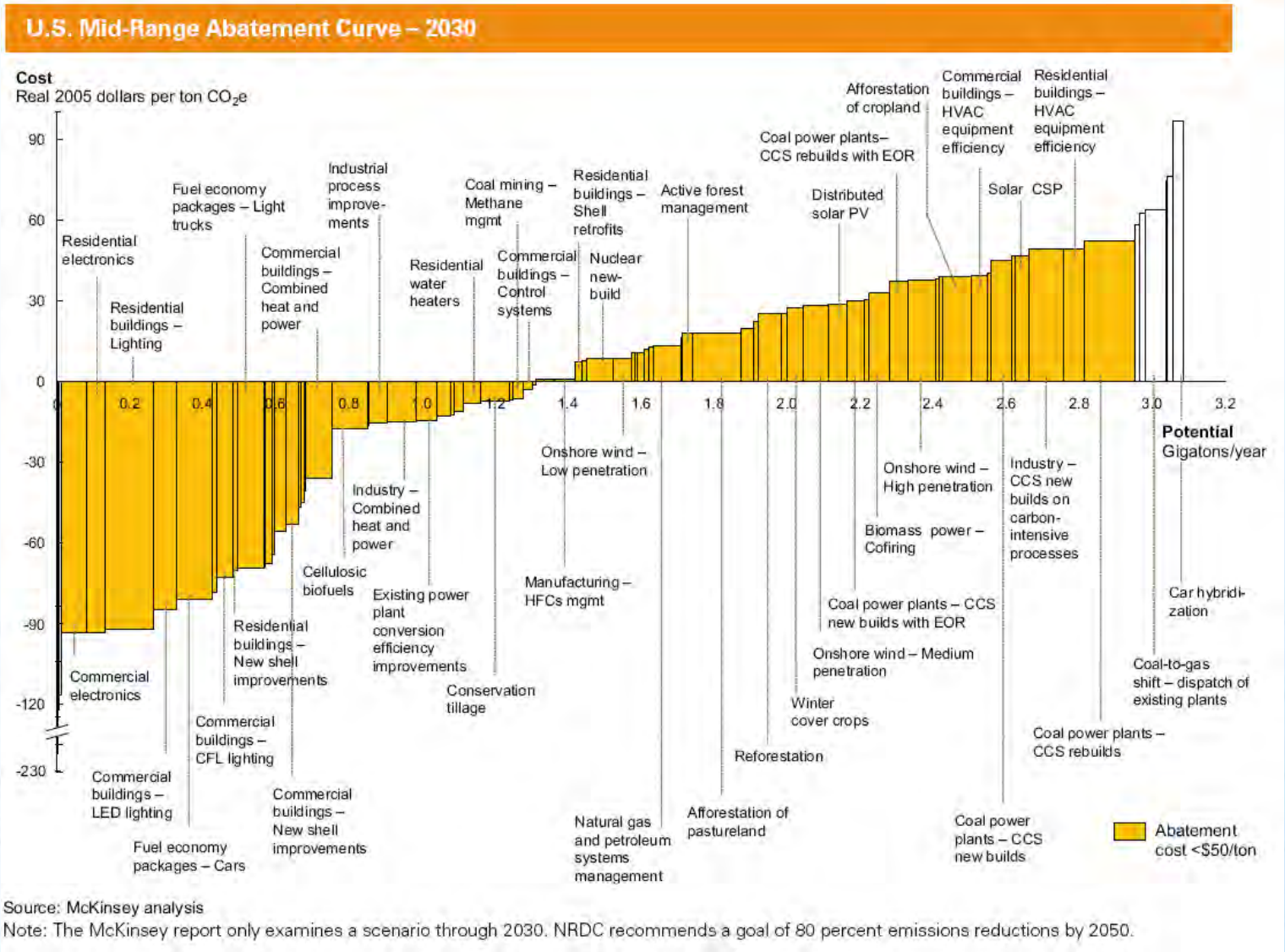
The Cheapest Still: Lessons from McKinsey



Source: McKinsey analysis
Note: The McKinsey report only examines a scenario through 2030. NRDC recommends a goal of 80 percent emissions reductions by 2050.

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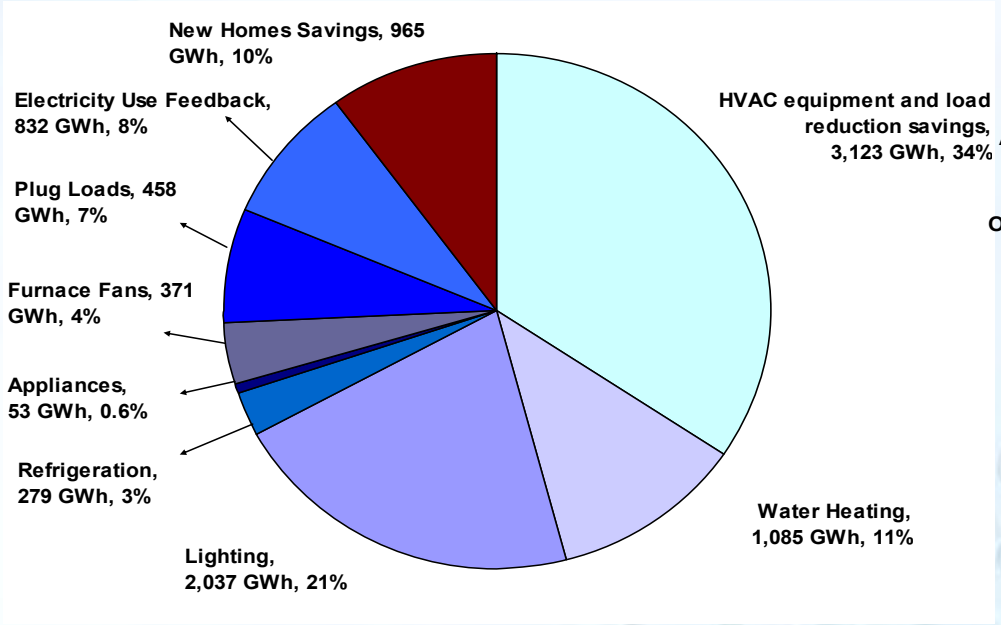
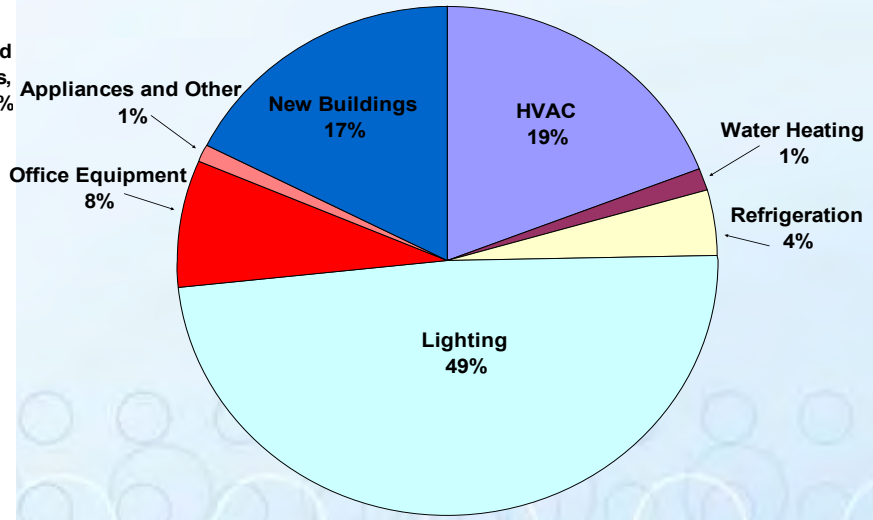
Many Efficiency Measures Contribute Towards Savings Targets



Residential



Commercial

Source: ACEEE Feb. 2008 Maryland study

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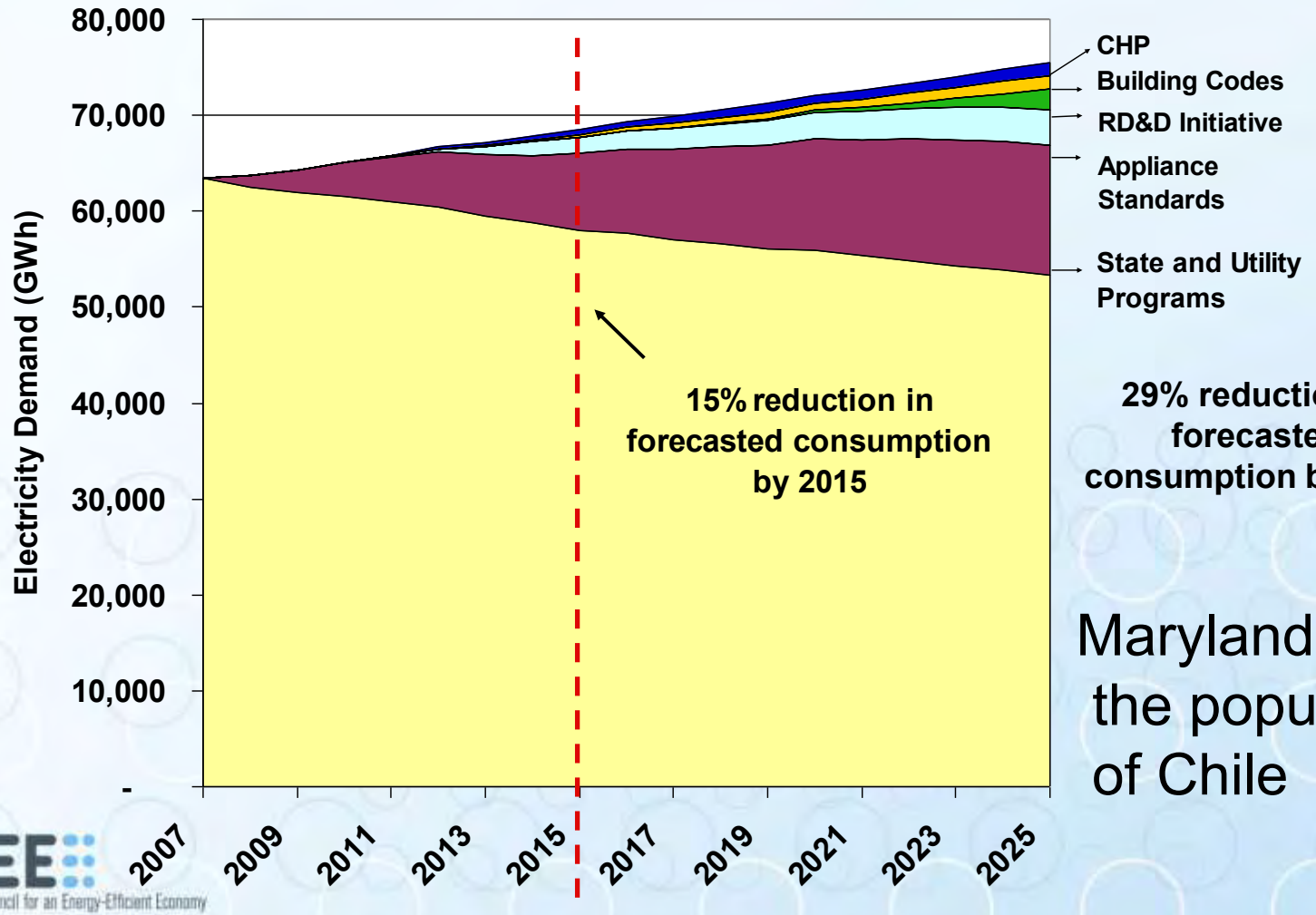
Share of Maryland Electricity Sales That Can Be Met by Efficiency Policies



Maryland is 1/3 the population of Chile

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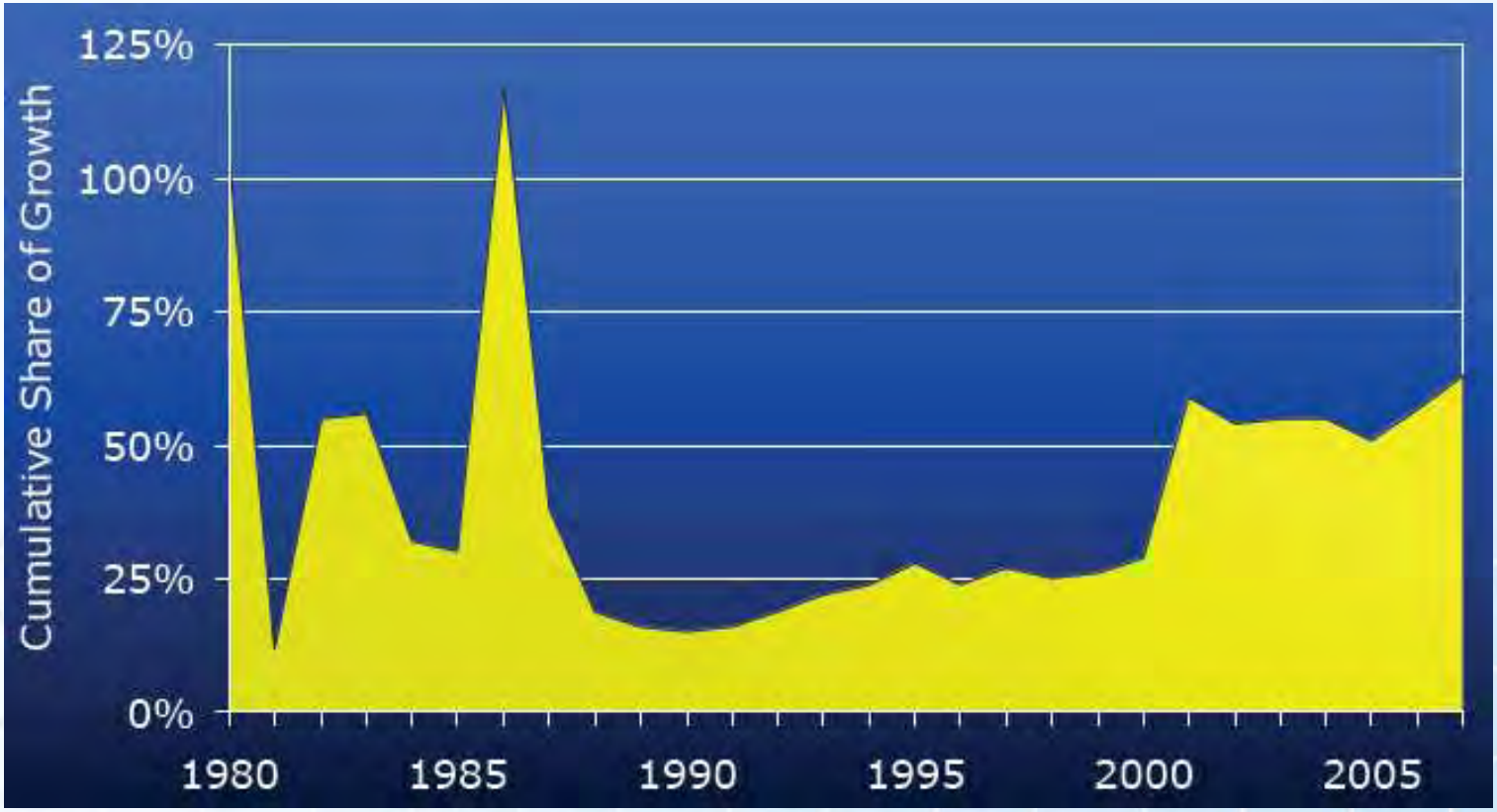
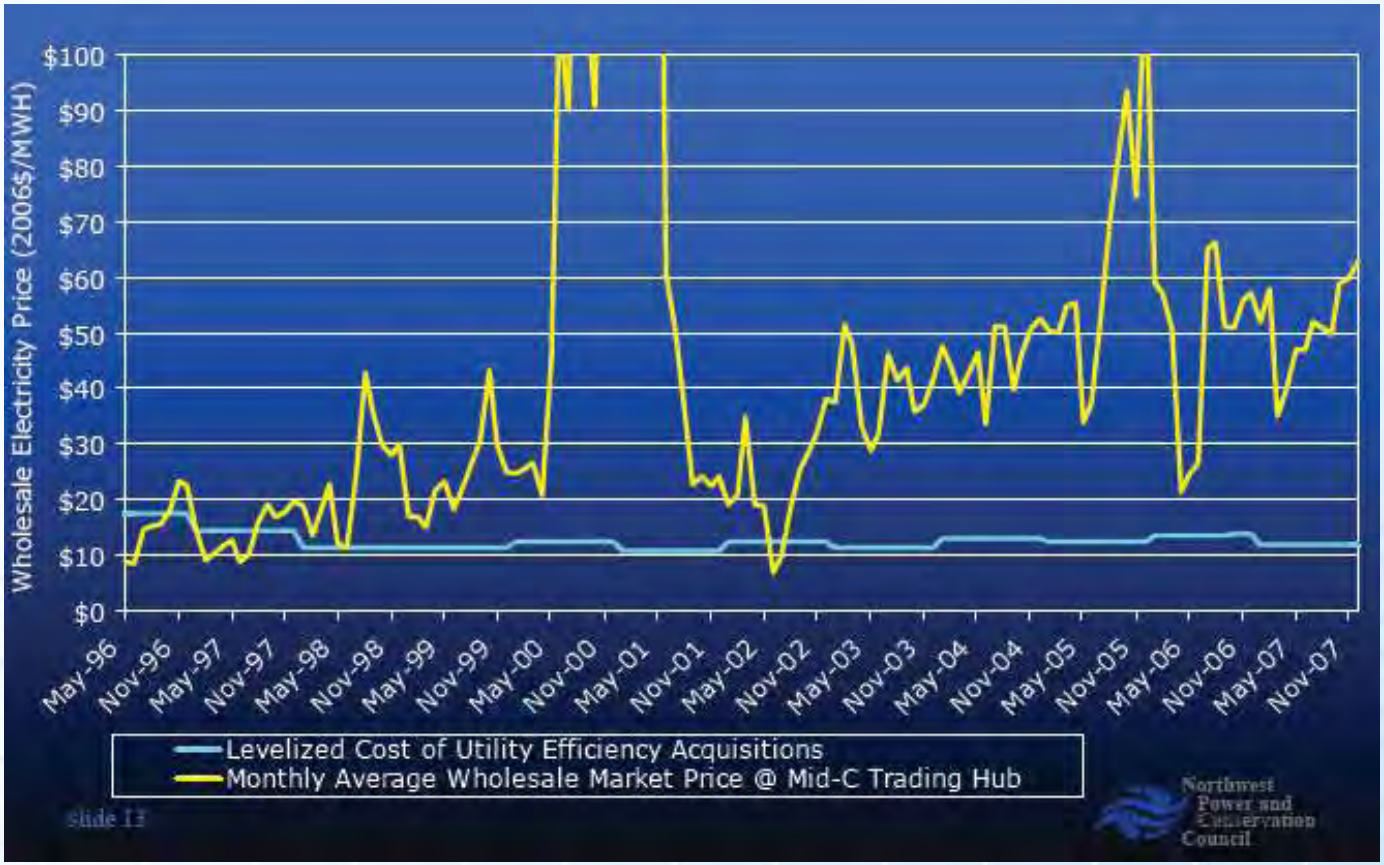
Energy Efficiency as a % of Load Growth in the Northwest



Source: Tom Eckman, Northwest Power and Conservation Council

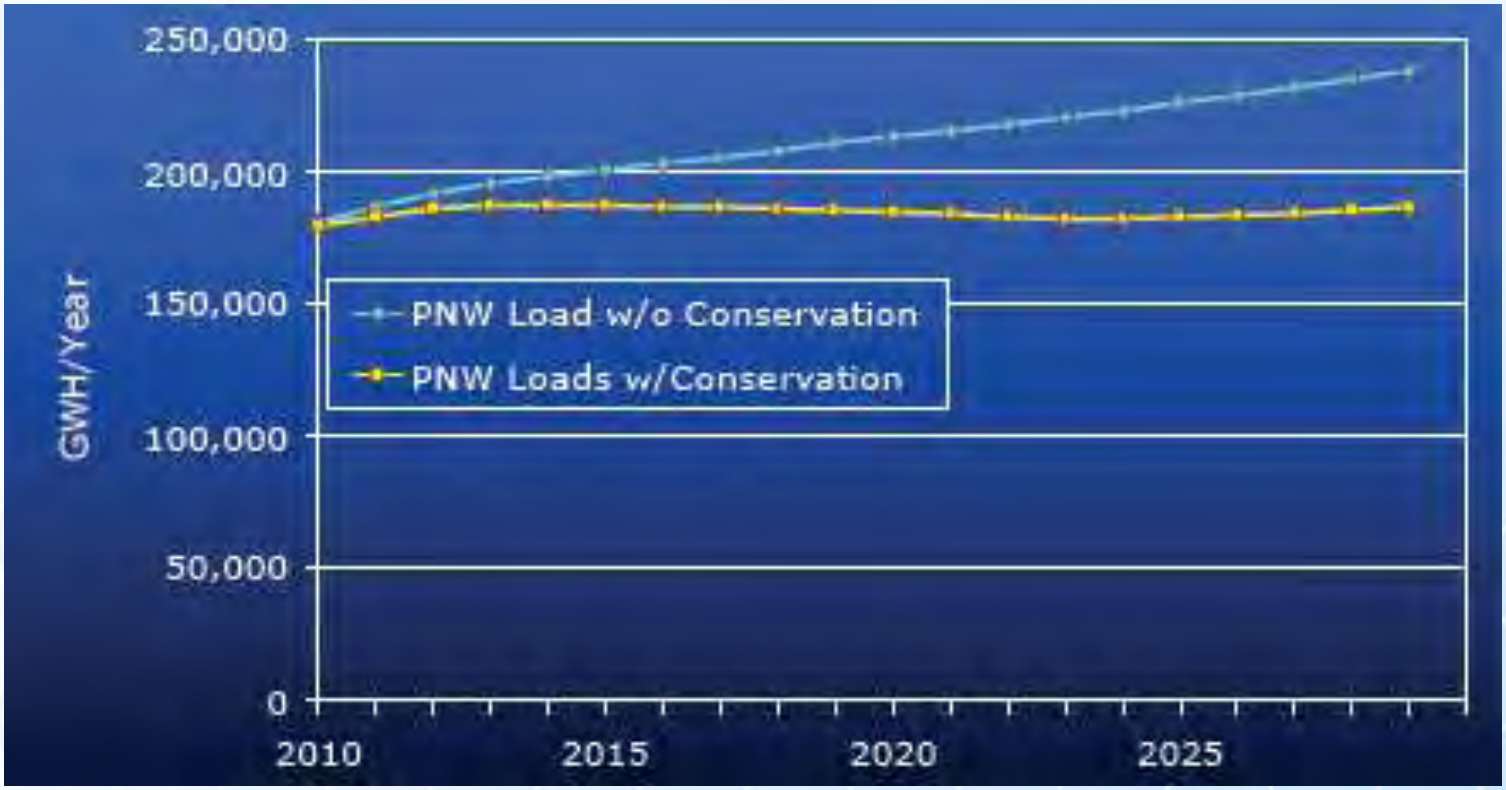
Comparison of Efficiency Cost to Wholesale Electric Prices



Source: Tom Eckman, Northwest Power and Conservation Council

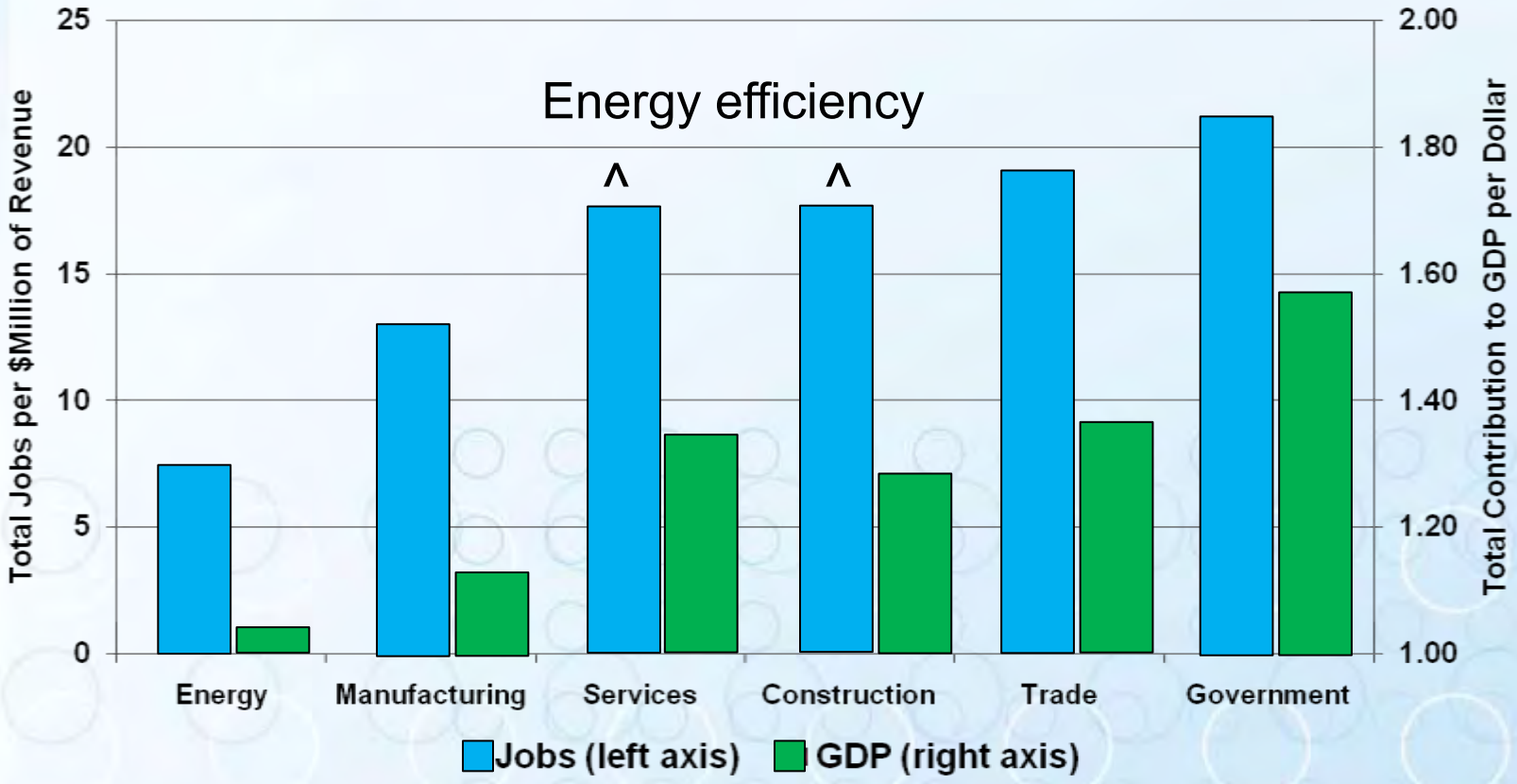
Northwest 6th Power Plan

- Meet 90% of growth with efficiency



Source: Tom Eckman, Northwest Power and Conservation Council

Energy Productivity Shifts Spending To Greater Labor and GDP Impacts



Source: 2007 IMPLAN data set for the U.S. economy (2009).

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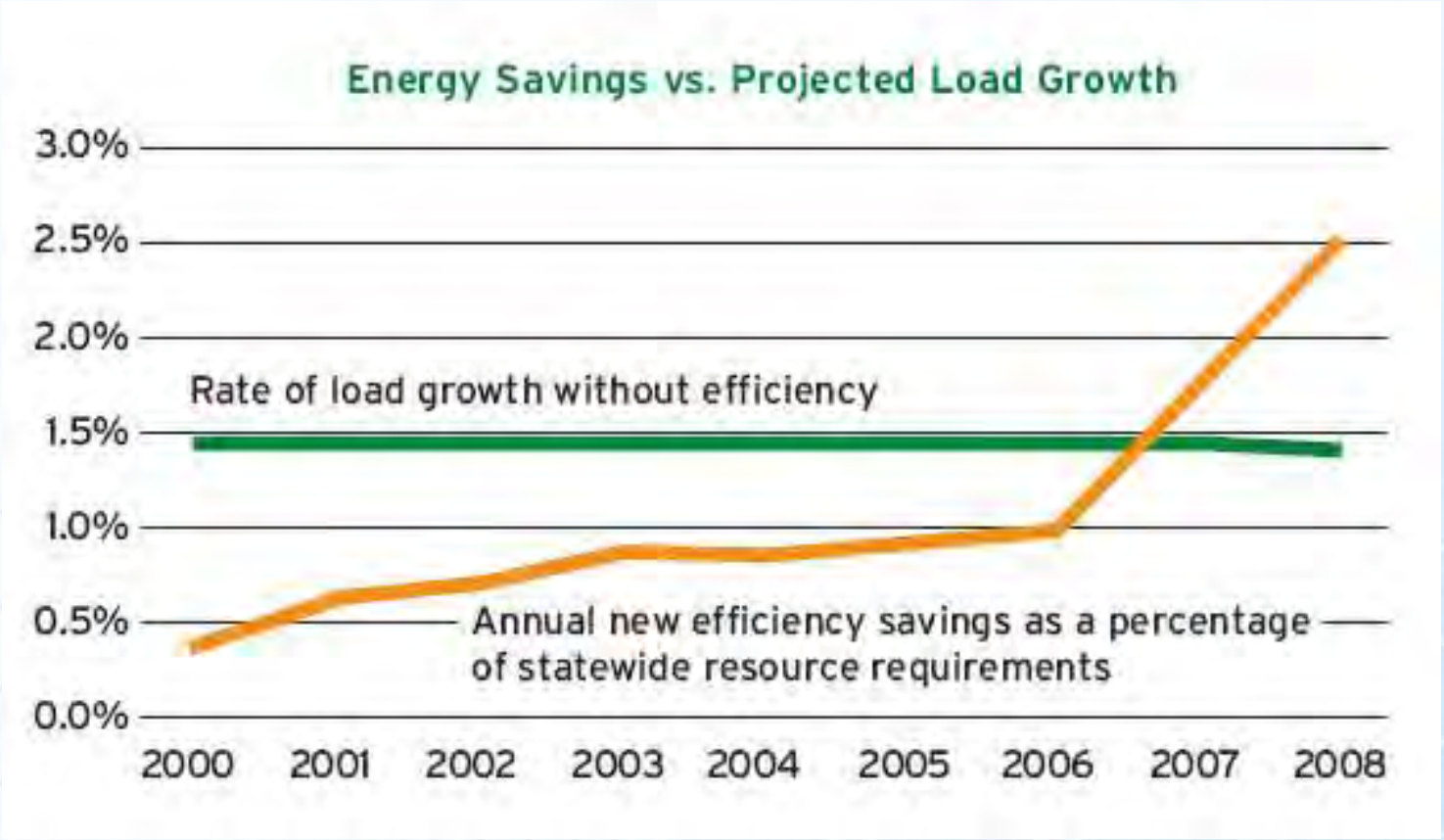
Vermont – Raising Efficiency to a New Level



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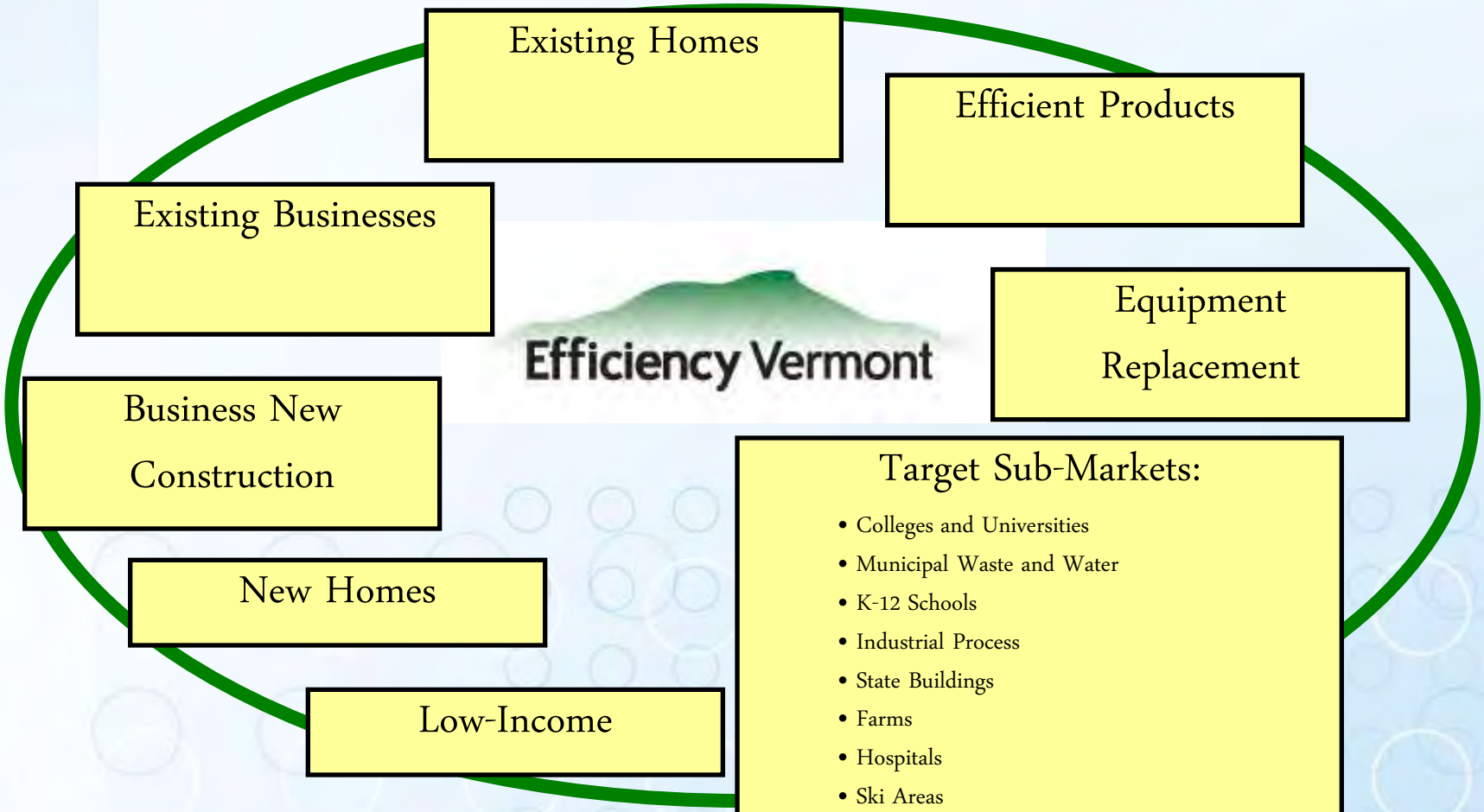
Source: Efficiency Vermont and VT Dept of Public Service

What Markets Do We Work In?



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2020 Cumulative Electricity Savings Targets by State

Vermont	30%	Indiana	14%
New York	26%	Rhode Island	14%
Massachusetts	26%	Hawaii	14%
Maryland	25%	California	13%
Delaware	25%	Ohio	12%
Illinois	18%	Colorado	12%
Connecticut	18%	Utah	11%
Minnesota	17%	Michigan	11%
Iowa	16%	Pennsylvania	10%
Arizona	15%	Washington	~10%

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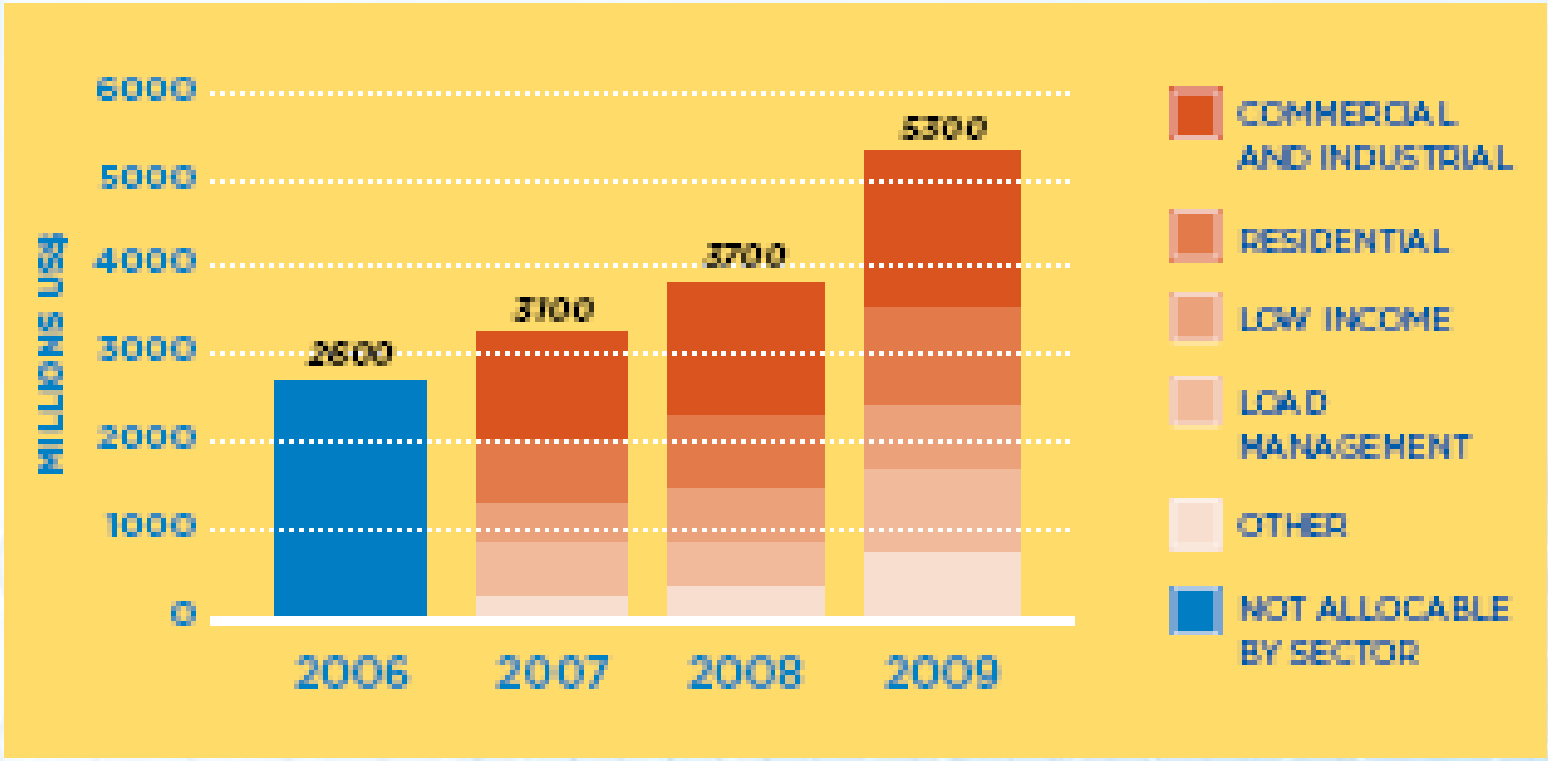
U.S. Electric and Gas Utility Budgets for Energy Efficiency & Load Management



Source: Consortium for Energy Efficiency

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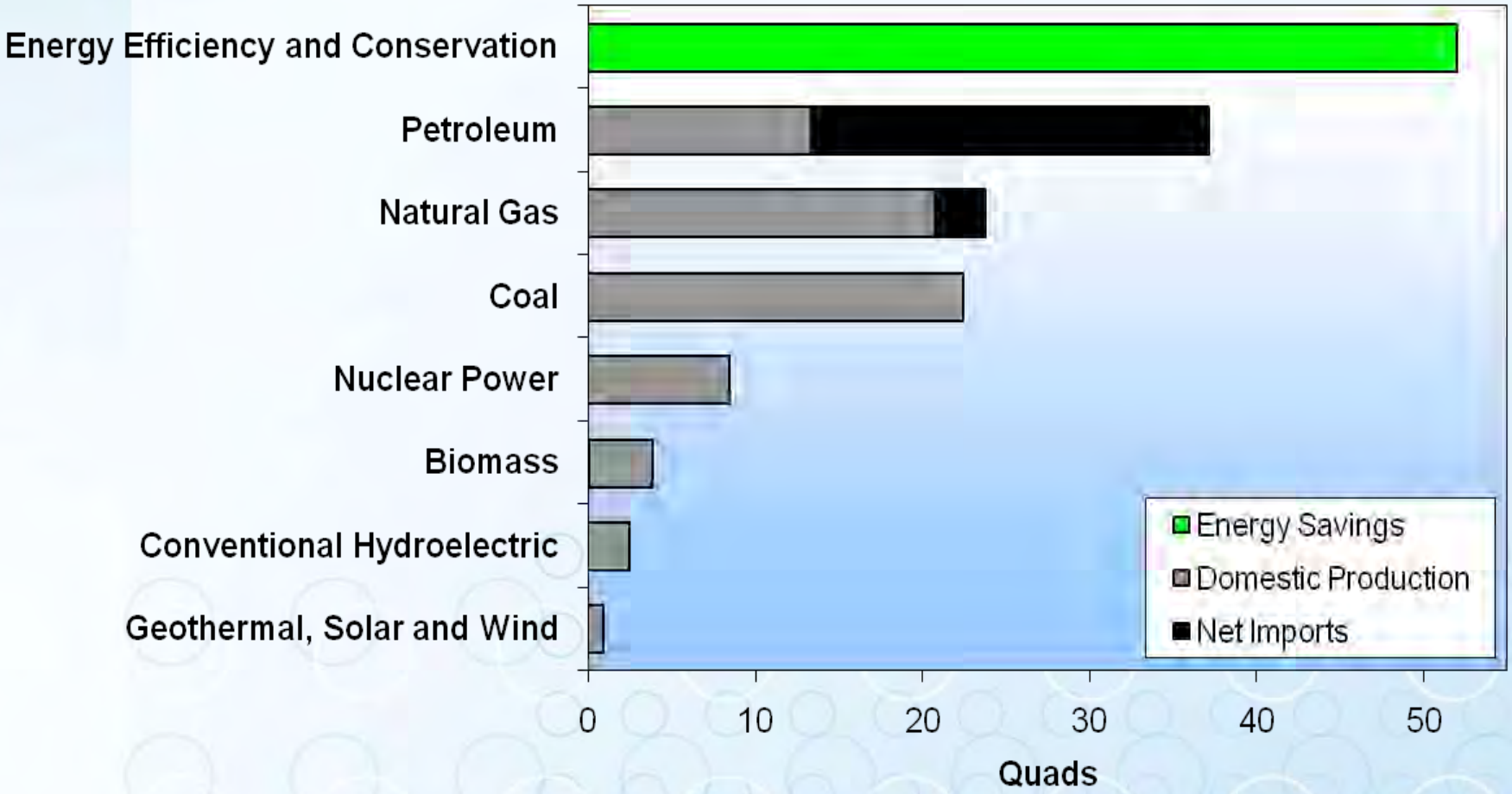
Energy Efficiency: America's Greatest Energy Resource



Alliance to Save Energy, 2009 (2008 data)

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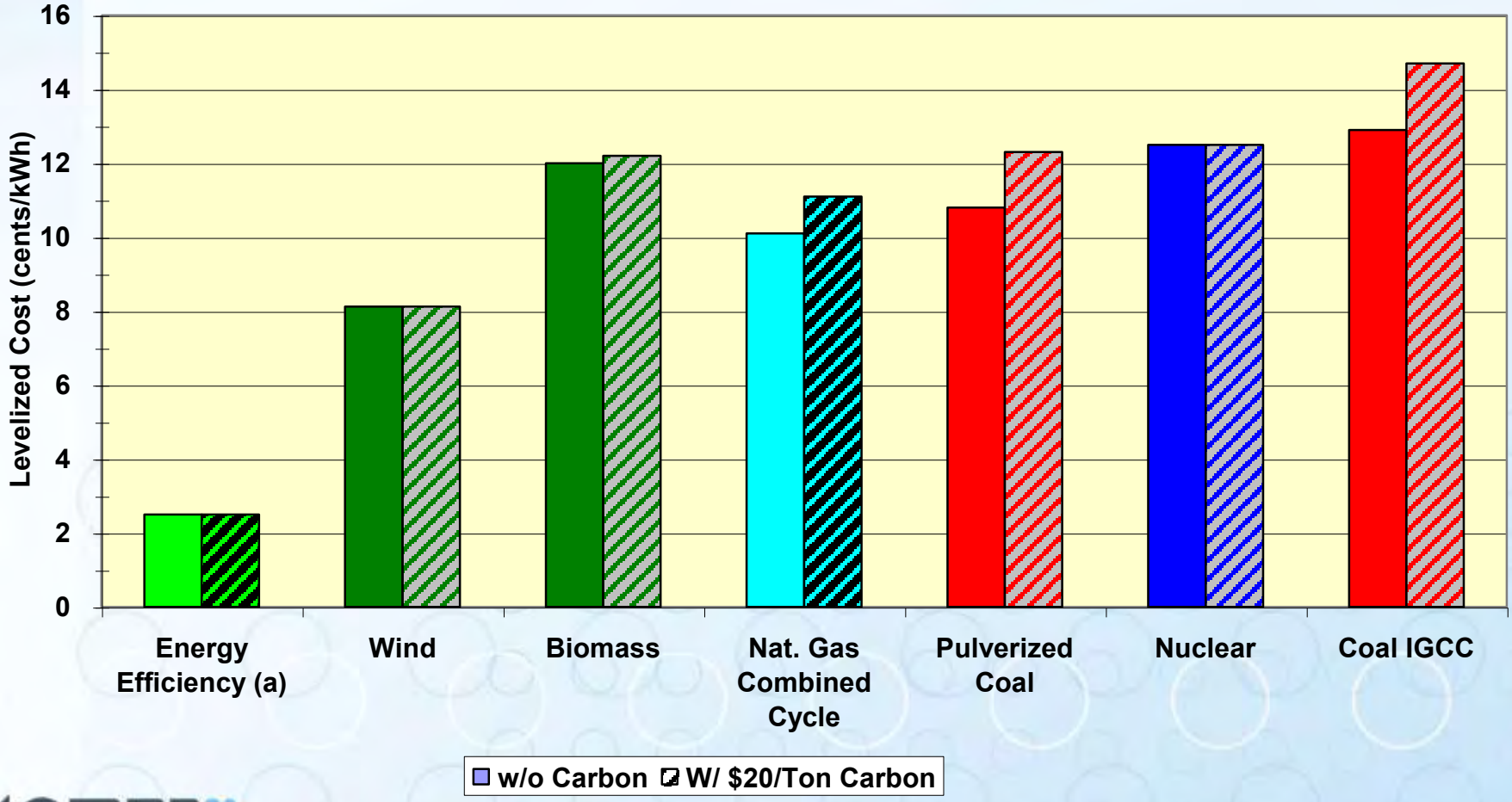
Δ Energy Efficiency: the 1st Fuel

Average Utility Cost of New Electric Resources



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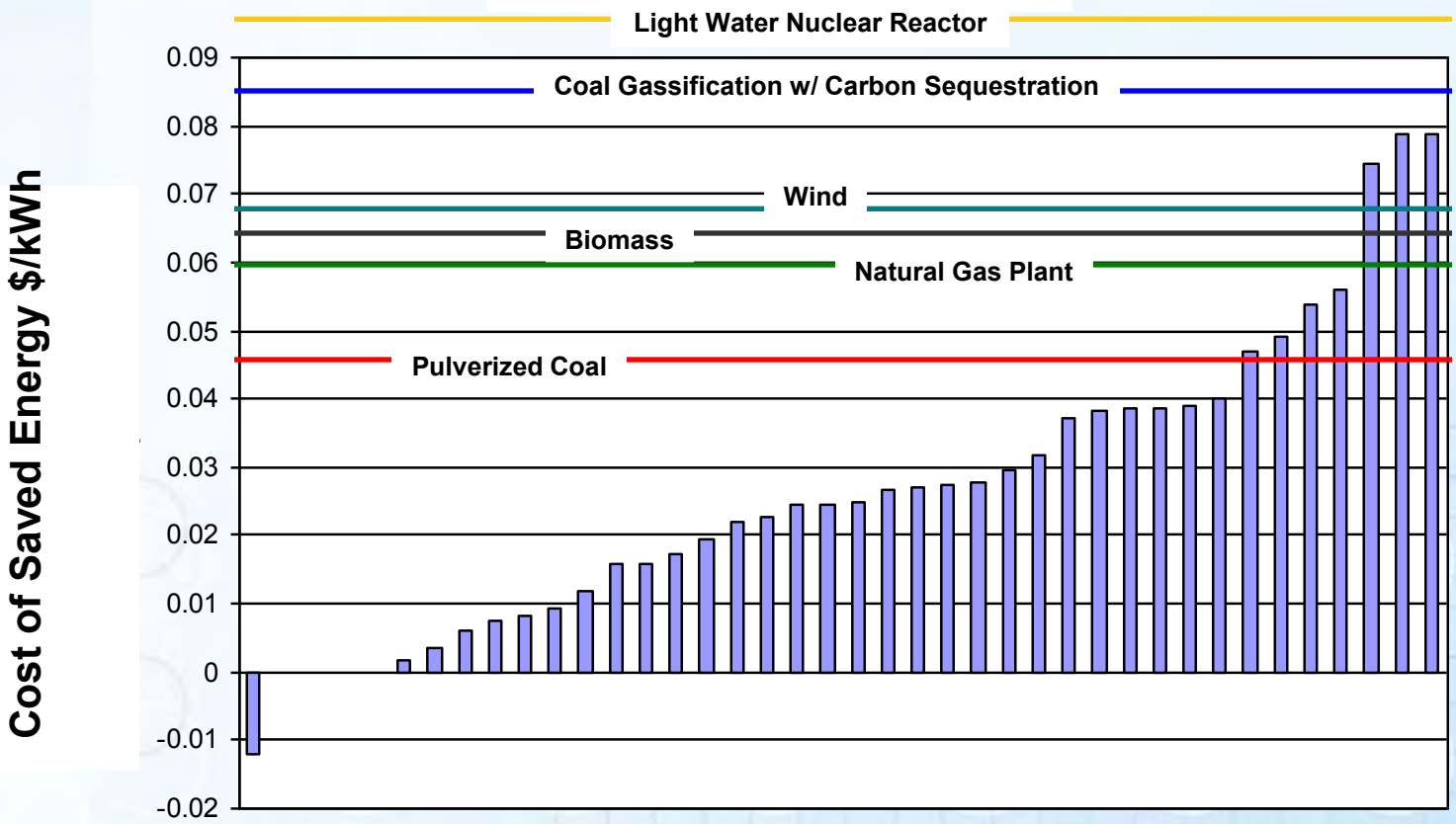
Source: UCS 2009 except (a) ACEEE 2009

Δ: Efficiency: The Cheapest Resource in the Future?



Cost of saved energy for 72 emerging energy-efficient technologies, in order of increasing CSE

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Appliance Standards in the U.S.

NAECA 1987

- Refrigerator-freezers
- Freezers
- Room air conditioners
- Central AC & heat pumps
- Furnaces & boilers
- Water heaters
- Clothes washers
- Clothes dryers
- Dishwashers
- Ranges & ovens
- Direct-fired space heaters
- Pool heaters
- Fluorescent lamp ballasts

EPAct 1992

- Fluorescent lamps
- Incandescent reflector lamps
- Electric motors (1-200 hp)
- Commercial AC & HP
- Comm'l furnaces/boilers
- Comm'l water heaters
- Showerheads
- Faucet aerators
- Toilets
- Small electric motors*

EPAct 2005

- Ceiling fan light kits
- Dehumidifiers
- Compact fluorescent lamps
- Torchiere lighting fixtures
- Large comm'l AC & HP
- Comm'l clothes washers
- Distribution transformers
- Exit signs
- Comm'l ice makers
- Comm'l refrigerators/freezers
- Mercury vapor lamp ballasts
- Traffic signals
- Pre-rinse spray valves
- Comm'l unit heaters
- Battery chargers*
- Large comm'l refrigeration

EISA 2007

- Incandescent lamps
- Additional motors (e.g. large)
- Walk-in coolers and freezers
- Metal halide lighting fixtures
- External power supplies
- Furnace fans*

ACES/ACELA 2010 (pending)

- Portable lighting fixtures
- Outdoor lighting fixtures
- Commercial furnaces
- Drinking water dispensers
- Portable electric spas
- Hot food holding cabinets

*** DOE rulemakings. Only include rulemakings that are underway or completed.**

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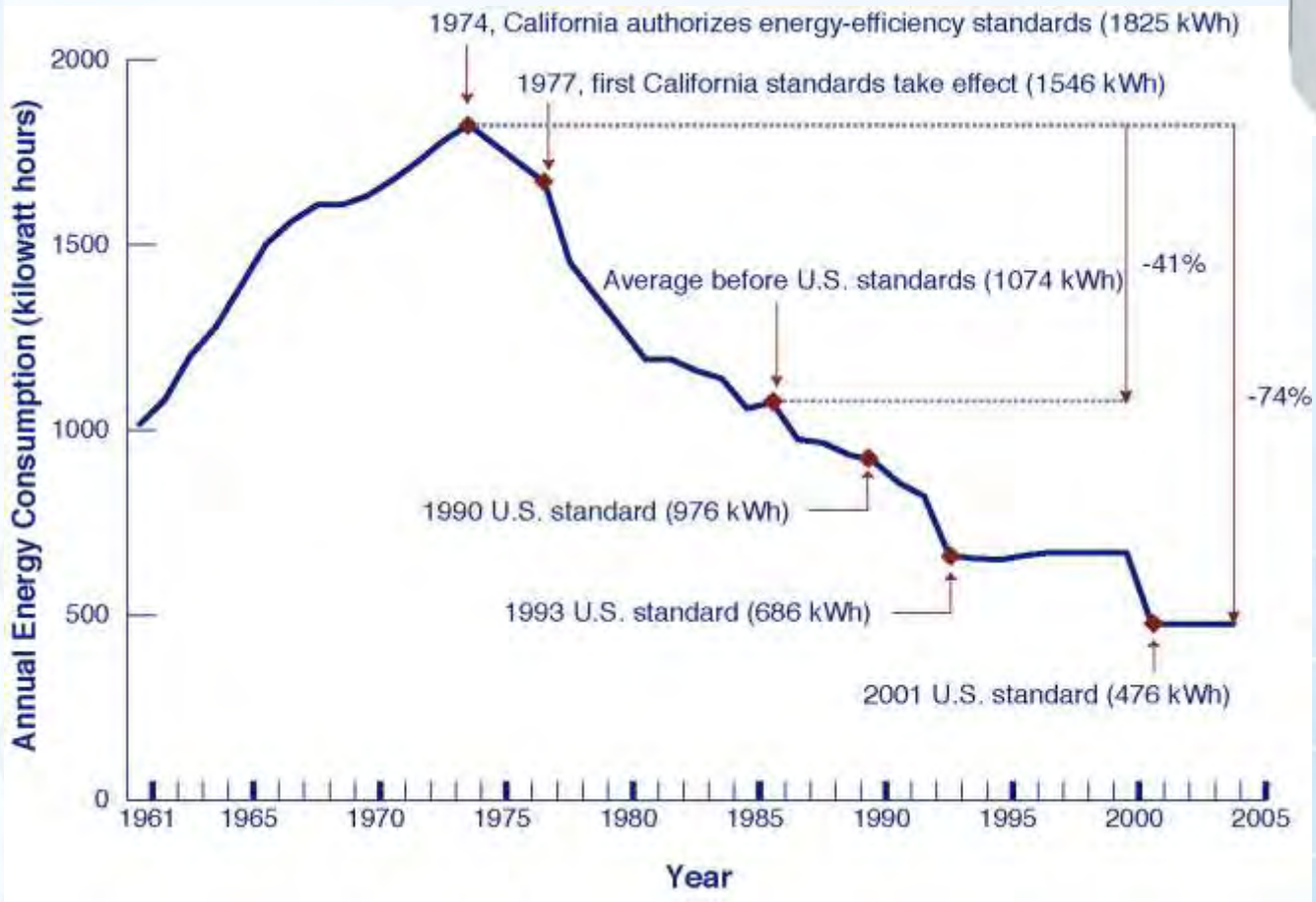
Impact of U.S. Refrigerator Efficiency Standards



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Energy, Economic and Emissions Savings from U.S. Standards

	2010	2020
Electric savings:		
TWh/year	393	672
% of U.S. end use	9.7%	15.0%
Primary energy savings:		
Quads/year	5.1	8.1
% of U.S. end use	5.0%	7.3%
Peak load reductions:		
MW	100,000	211,000
% of U.S. demand	10.1%	20.7%
Carbon reductions		
MMT/year	95	146
% of U.S. emissions	5.8%	8.4%
Net benefits thru 2030	$416 billion	

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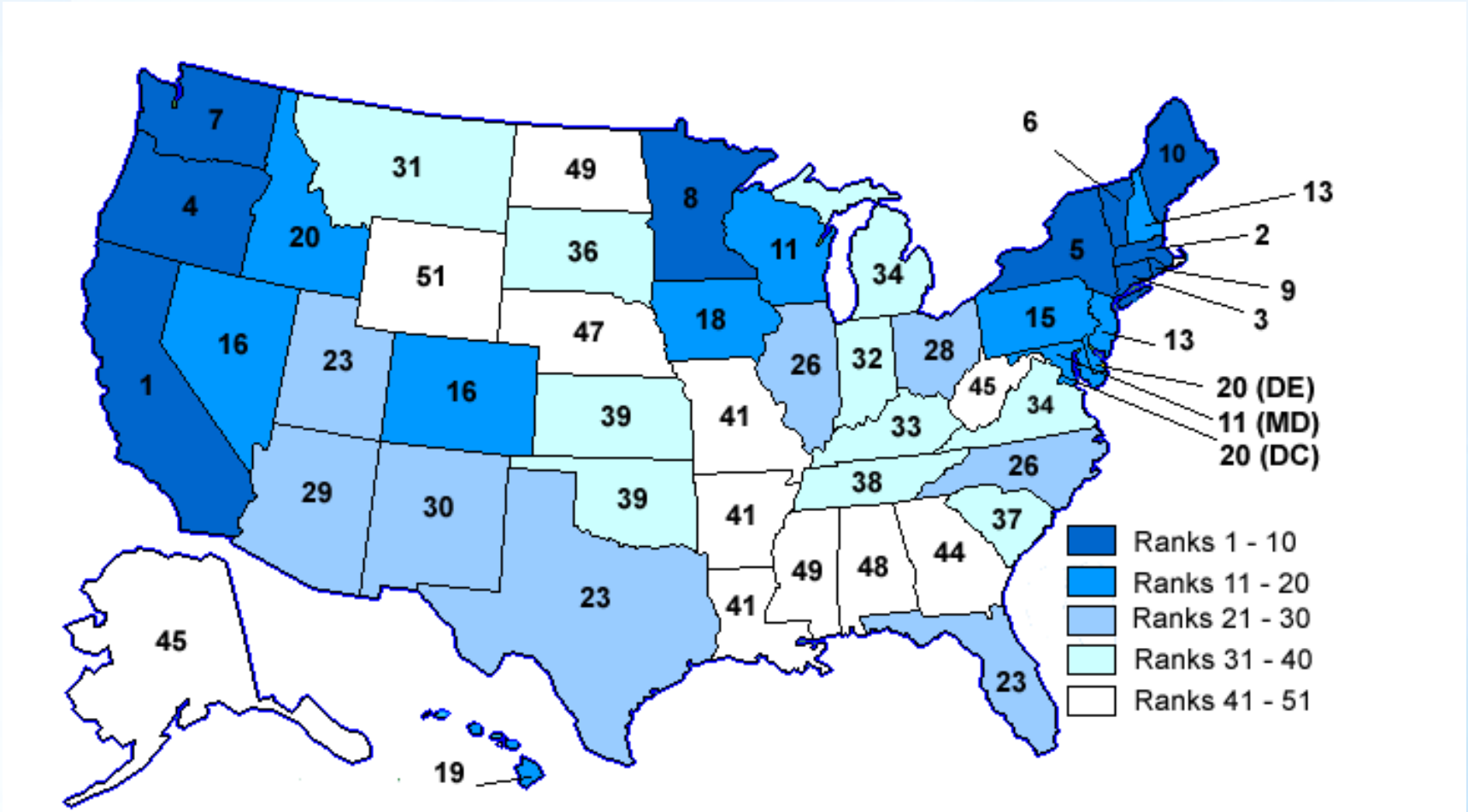
Building Codes for New Construction

- It is much less expensive to build new buildings to be efficient than to build inefficiently and have to improve later
- Building codes can mandate that efficiency features be incorporated
- Both residential and commercial
- Can require:
  - Insulation, efficient windows
  - Efficient lighting, heating, cooling, water heating and ventilation

ACEEE's *2009 State Energy Efficiency Scorecard* Results



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http://aceee.org/pubs/e097.htm

Lessons

Energy Efficiency is huge:

- has been by far the biggest energy resource in America for the past 30 year.*
- The cheapest now.
- Extremely promising in the future.

*Yes, even considering structural changes in the Economy

ACEEE Best Practices Study

Profile best programs in the following categories:

- Agriculture
- Commercial/Industrial Lighting
- C/I Motor and HVAC Replacement
- C/I New Construction
- C/I Niche/Other
- C/I Retrofit
- Emerging Technologies, Development and Demonstration
- Food Service Industry
- Industrial Process Efficiency
- Municipal, Collaborative and Multi-sector
- Low-income
- Residential Lighting
- Residential Lighting & Appliances
- Residential Mechanical
- Residential Multifamily
- Residential New Homes
- Residential Niche/Other
- Residential Retrofit
- Schools
- Small Business

Download at:
http://www.aceee.org/pubs/u081.htm

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Thanks!

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