Perspectives on Energy Efficiency

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Utility Committee
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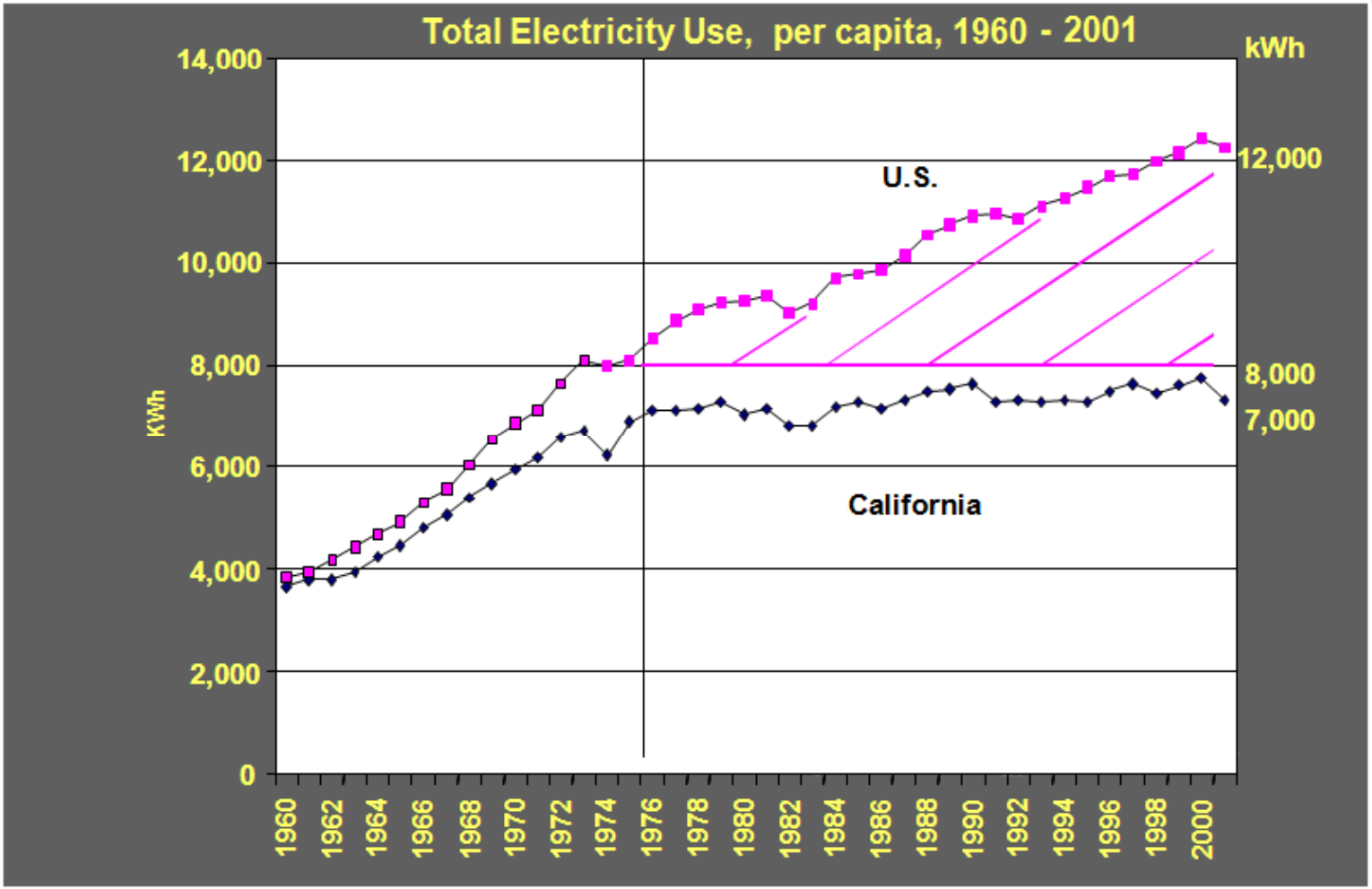
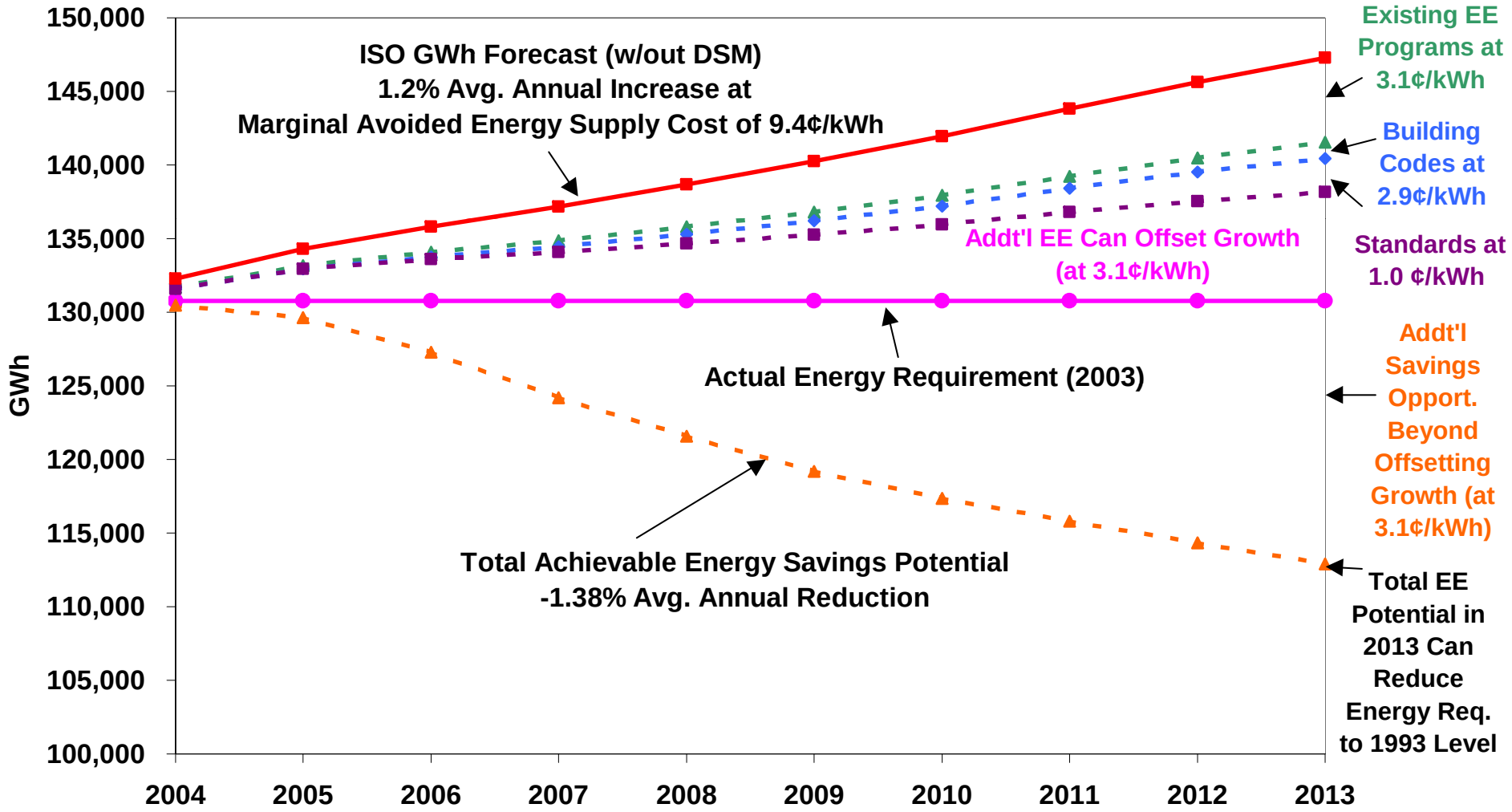
Energy Efficiency: Is it real?



Source: California Energy Commission

Existing and New EE Strategies Can Offset ISO Forecasted Energy Requirements (GWH) and Beyond



Source: NEEP

Massachusetts Energy Efficiency Savings

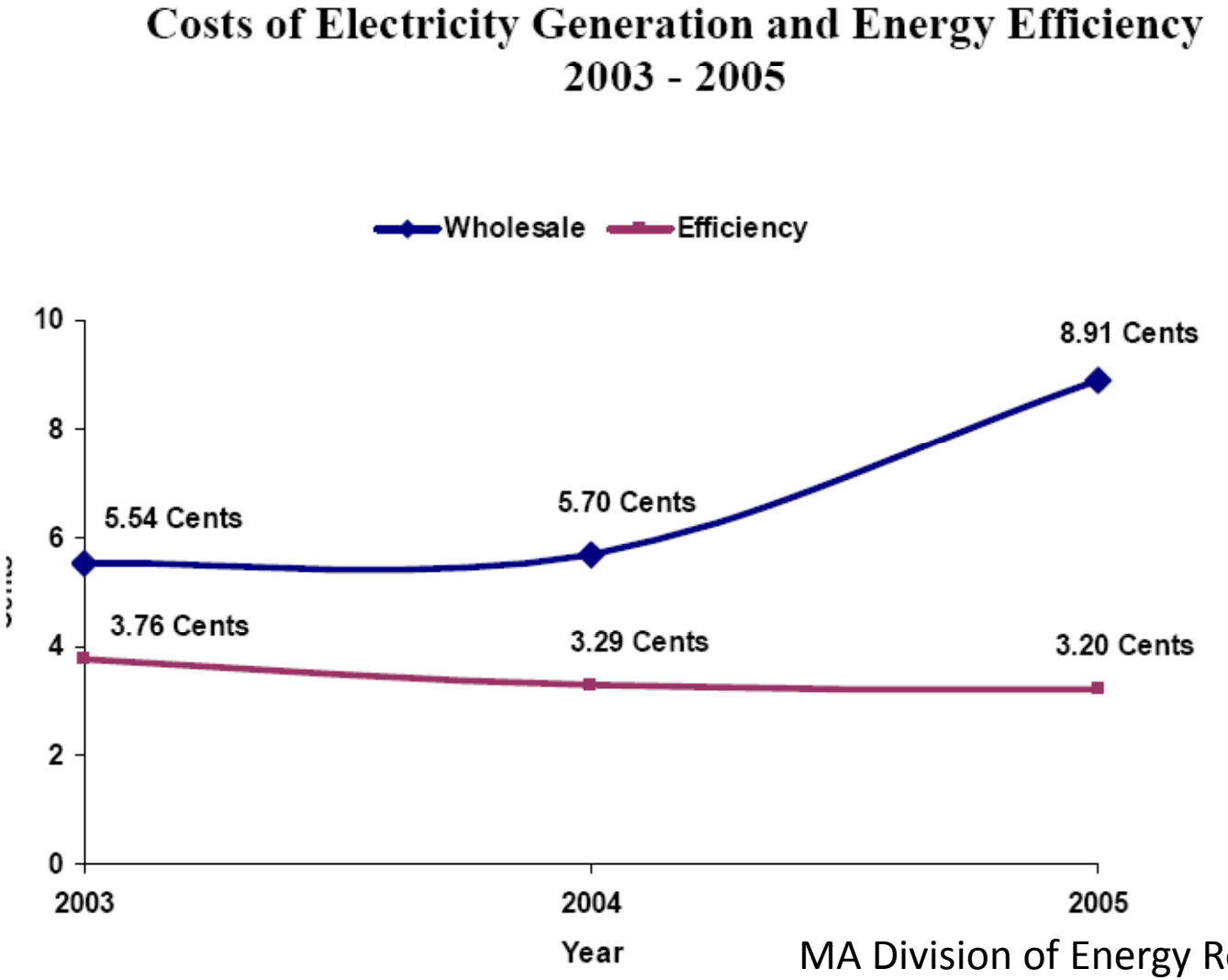
Participants and Annual Bill Savings, 2002-2005.

Program Summary 2003-2005

Customer Class	# Participants	Cost	Annual Bill Savings	Lifetime Bill Savings
		(millions)		
Residential	1,520,391	$168	$35	$319
Low Income	420,525	$48	$12	$133
Small Commercial & Industrial	10,075	$49	$10	$132
Medium Commercial & Industrial	6,342	$96	$18	$258
Large Commercial & Industrial	1,913	$143	$25	$387
Total	**1,959,246**	**$504**	**$100**	**$1,229**

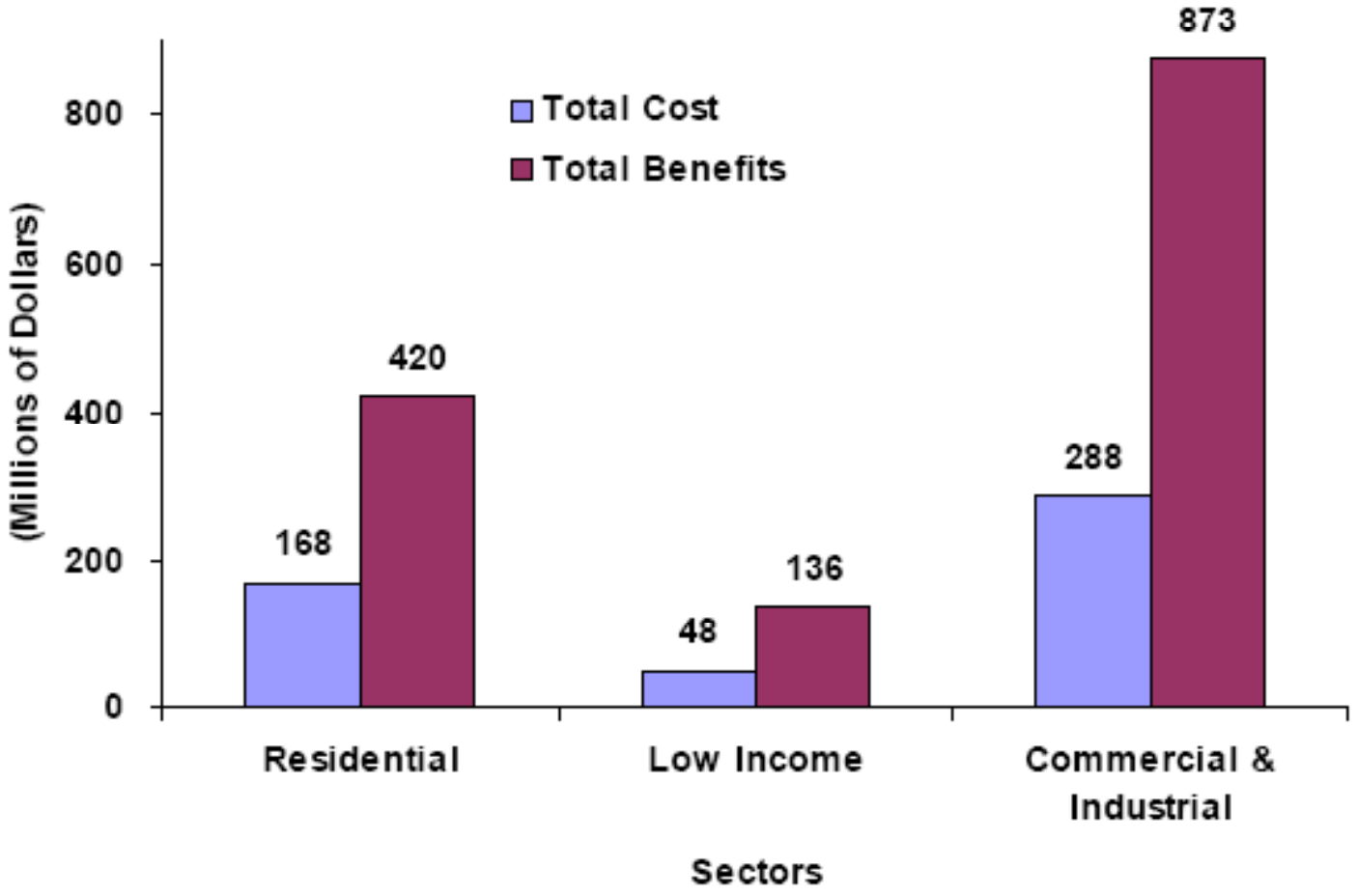
MA Division of Energy Resources

Cost of Energy Efficiency versus Supply-side Resources



MA Division of Energy Resources

Massachusetts: Savings and Costs by Sector



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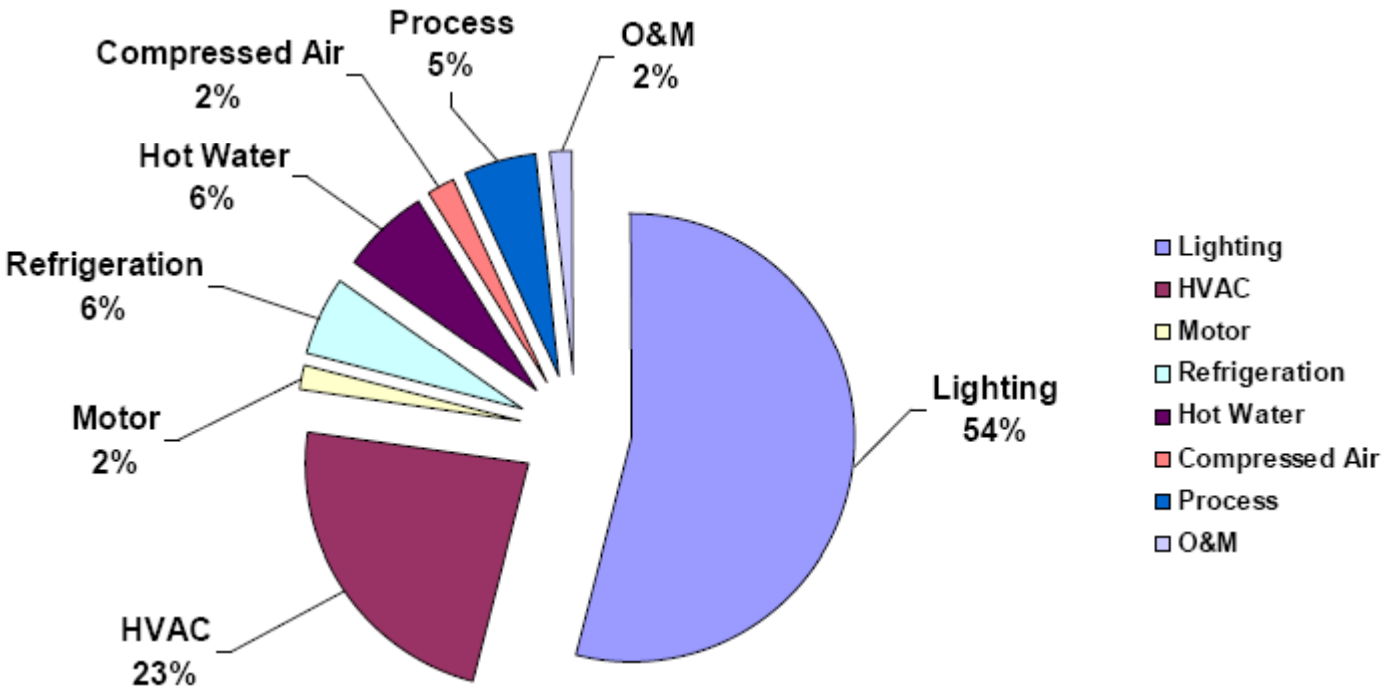
Massachusetts:
Energy Efficiency Savings by End-use



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Where Savings Come From: Both Participants and Non-Participants

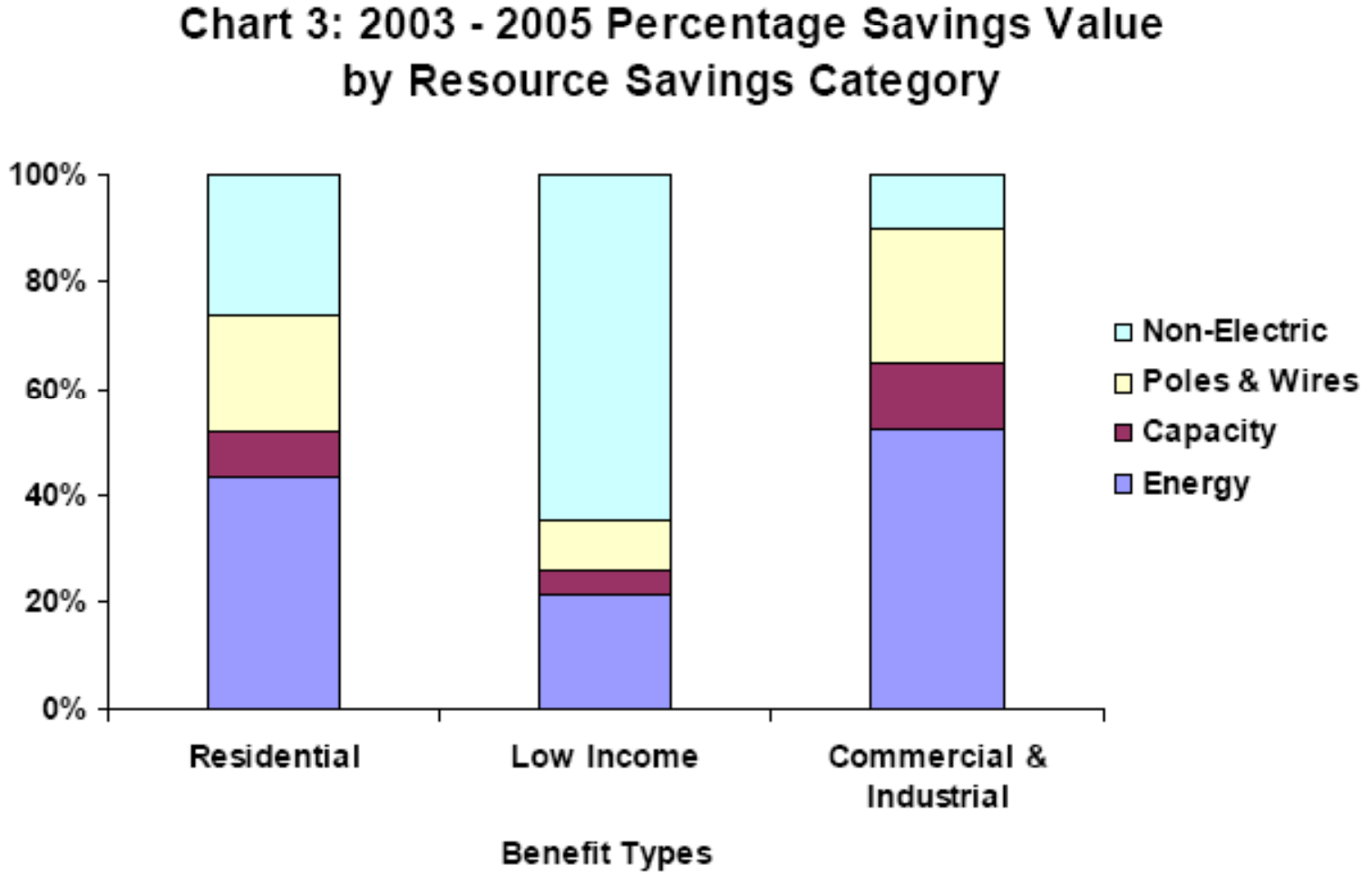
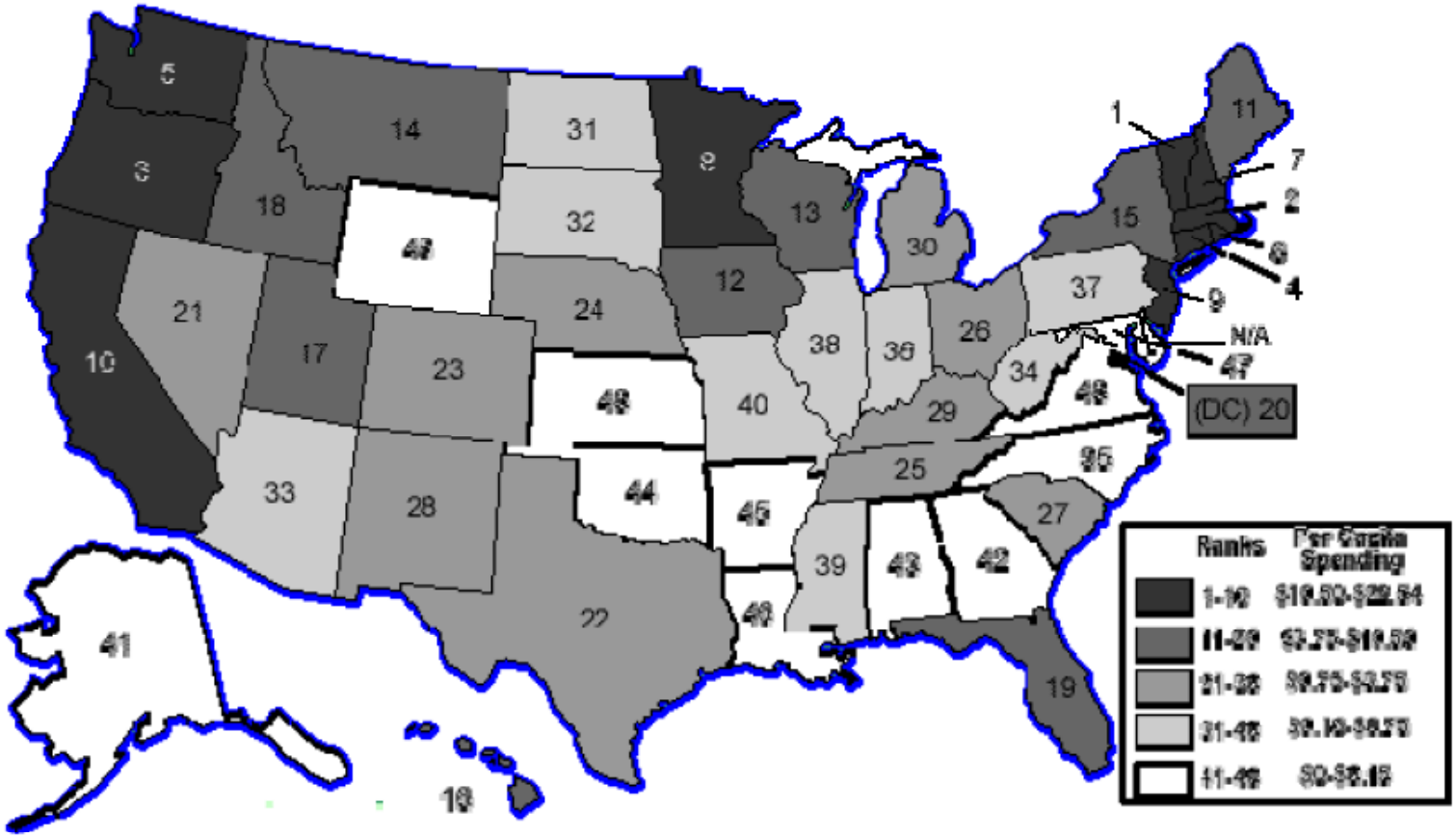


Table 1.2. 2004 Utility Spending by State: Total, Per Capita, Ranking by Spending Capita, and Scores*

	2004 Total Spending* ('$1000)	Per Capita Spending	Ranking by Spending per Capita	Score
Vermont	14,000	$22.54	1	15
Massachusetts	133,326	$20.81	2	13.5
Oregon	62,888	$17.51	3	11.5
Connecticut	58,098	$16.60	4	11
Washington	88,522	$14.26	5	9.5
Rhode Island	13,990	$12.95	6	8.5
New Hampshire	15,120	$11.64	7	7.5
Minnesota	55,784	$10.95	8	7
New Jersey	92,753	$10.68	9	7
California	380,009	$10.60	10	7
Maine	13,118	$9.98	11	6.5
Iowa	28,833	$9.76	12	6.5
Wisconsin	53,734	$9.76	12	6.5
Montana	8,002	$8.63	14	5.5
New York	147,193	$7.63	15	5
Hawaii	9,190	$7.28	16	4.5
Utah	16,450	$6.80	17	4.5
Idaho	7,023	$5.03	18	3
Florida	72,014	$4.14	19	2.5
District of Columbia	2,200	$3.97	20	2.5
Nevada	8,473	$3.63	21	2
Texas	80,000	$3.56	22	2
Colorado	13,715	$2.98	23	1.5
Nebraska	4,348	$2.49	24	1.5
Tennessee	10,937	$1.86	25	1

Source: ACEEE

State Ranking: Program Spending per Capita



How To Think About Energy Efficiency

- Utility systems must balance loads and resources
- Objective should be to do this at the least-cost
- When making choices about how to balance the system, demand-side resources (such as energy efficiency and distributed generation) are equivalent to new supply-side resource – whichever costs less is what should be procured

Traditional Regulatory Incentives Run Counter to Public Policy

- "Throughput" incentive (so-called because profits increase with units sold) is at odds with a requirement to invest in cost-effective energy efficiency
- Policies should, instead, align utilities' profit motives with acquisition of all cost-effective energy efficiency

Utility Financial Structures Enhance Power of Incentives

- High leverage and high fixed costs means that utility profits represent relatively small share of total revenues
  - All of revenue changes on the margin affect profit
  - This makes profits highly sensitive to changes in revenues
- <u>The effect may be quite powerful…</u>

How Changes in Sales Affect Earnings

	Revenue Change		Impact on Earnings		
% Change in Sales	Pre-tax	After-tax	Net Earnings	% Change	Actual ROE
5.00%	$9,047,538	$5,880,900	$15,780,900	**59.40%**	17.53%
4.00%	$7,238,031	$4,704,720	$14,604,720	**47.52%**	16.23%
3.00%	$5,428,523	$3,528,540	$13,428,540	**35.64%**	14.92%
2.00%	$3,619,015	$2,352,360	$12,252,360	**23.76%**	13.61%
1.00%	$1,809,508	$1,176,180	$11,076,180	**11.88%**	12.31%
0.00%	$0	$0	$9,900,000	**0.00%**	11.00%
-1.00%	-$1,809,508	-$1,176,180	$8,723,820	**-11.88%**	9.69%
-2.00%	-$3,619,015	-$2,352,360	$7,547,640	**-23.76%**	8.39%
-3.00%	-$5,428,523	-$3,528,540	$6,371,460	**-35.64%**	7.08%
-4.00%	-$7,238,031	-$4,704,720	$5,195,280	**-47.52%**	5.77%
-5.00%	-$9,047,538	-$5,880,900	$4,019,100	**-59.40%**	4.47%

Revenue Erosion: Revenue-Profit Decoupling

- Breaks the mathematical link between sales volumes and profits
- Objective is to make profit levels immune to changes in sales volumes
  - This is a revenue issue
  - This is not a pricing issue
  - Volumetric pricing approaches need not be changed
- Does not decouple customers' bills from consumption

Revenue Decoupling: The Basic Concept

- Basic Revenue-Profit Decoupling has two primary components:
  - Determine a "target revenue" to be collected in a given period
    - In the simplest form of revenue decoupling (sometimes called "revenue cap" regulation), Target Revenues are always equal to Test Year Revenue Requirements
    - Other approaches have formulas to adjust Target Revenue over time
  - Set a price which will collect that target revenue
- This is the same as the last step in a traditional rate case – i.e. Price = Revenues ÷ Units

The Decoupling Calculation

- Utility Target Revenue Requirement determined with traditional rate case
  - By class & by month (or other period coinciding with how often decoupling adjustment is made)
- Each future period *will have* different *actual* unit sales than Test Year
- The difference (positive or negative) is flowed through to customers by adjusting Price for that period (see Post Rate Case Calculation)

Periodic Decoupling Calculation	
From the Rate Case	
Target Revenues	$10,000,000
Test Year Unit Sales	100,000,000
Price	$0.10/Unit
Post Rate Case Calculation	
Actual Unit Sales	99,000,000
Target Revenues (from above)	$10,000,000
Required Total Price	$0.10101/Unit
Decoupling Price "Adjustment"	$0.00101/Unit

Decoupling Eliminates Weather Risks For Utility & Customers

- Weather risk is the risk that revenues change on account of changes in weather
- If you receive more (or less) revenues or pay less (or more) in customer bills on account of weather, then you face weather risk
  - In extreme weather, consumption goes up, along with profits and consumer bills
  - In mild weather, consumption goes down, along with profits and consumer bills
- Both utility and customer face risk, with opposite economic effect
- This is a weather-driven wealth transfer between utility and customers

Incentives in a Third Party Administration Model

- TPA should have its own incentive mechanism as part of its business model
- But, utility still faces revenue erosion from TPA deployed energy efficiency
  - Unresolved disincentive means utility will likely *not* be working in concert with TPA to further policy objectives
- To extent utility remains in energy efficiency business, positive incentives are needed for utility business model

Thanks for your attention…

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