

Testimony on “An Act to Encourage Energy Efficiency” (LD 1931)  
before the  
Committee on Utilities, Energy and Transportation  
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**Introduction**

Senator Bartlett, Representative Bliss, and Members of the Utilities, Energy and Transportation Committee. Good afternoon. My name is Bob Fagan. I am a senior associate at Synapse Energy Economics, a small energy economics consulting firm in Massachusetts. I am a mechanical engineer and energy economics analyst with 20 years of experience in the energy industry; my bio is attached.

I am testifying today as a consultant to the Natural Resource Council of Maine and Environmental Defense. These organizations asked Synapse to examine two primary issues:

1. The costs and benefits associated with the increase in Maine’s System Benefit Charge as proposed by LD 1931; and
2. The current state of energy efficiency investment in Maine in comparison to other states.

**I. Summary of the Effect of Increasing Electricity Efficiency Investment through the System Benefits Charge**

As part of our analysis, we produced a funding projection of revenues available to Efficiency Maine both in a status quo scenario (0.15¢/kWh) and the increased investment scenario proposed in LD 1931 (doubling revenue-generation over a three-year period). We have assessed annual net benefits utilizing a range of different Benefit/Cost (B/C) ratios – from a conservative overall programmatic B/C ratio of 1.5 to a more ambitious B/C ratio of 3.0. Efficiency Maine currently reports an aggregate B/C ratio of 2.26.

Our funding projections assume initial increased revenues to Efficiency Maine starting in 2007, and we have projected out through 2012, factoring in estimated expenses to cover Power Partner contract expenses. We assume that the portfolio of programs offered by Efficiency Maine remain generally the same, with 20% of available funding for small business and 20% for low-income customers as required by law. We do note, however, that with increased revenues, we believe that a broader set of program offerings could be provided, and that the B/C ratio for some of the programs could increase through improved economies of scale. Other new programs investing in a greater depth of energy efficiency savings could exhibit B/C ratios lower than Efficiency Maine’s current average.

From this analysis, we believe lawmakers could comfortably conclude that this legislation will provide, for the period 2007 through 2012, anywhere from a low of \$45.2 million in incremental **net** benefits to Maine's electricity consumers, to a high of \$180.6 million, compared with status quo funding for Efficiency Maine. These are Net Present Value figures, utilizing a B/C ratio of 1.5 on the low side and 3.0 on the high side. The handout includes graphs showing these scenarios.

This estimate is fully consistent with prior studies, which have concluded that an increase in the electric system benefits charge in Maine will result in highly cost-effective, increased energy efficiency savings for Maine residents and businesses. Based on a report conducted for the Maine Office of Public Advocate in 2002, for example, and an updated assessment recognizing the increased "avoided costs" of electricity, the expected benefit cost ratio associated with increased procurement of a full array of energy efficiency resources is at least as high as 1.4 to 2.1 when total costs, not just programmatic costs, are accounted for. The handout includes a table showing this.

If a relatively selective approach to efficiency program implementation is considered instead of "the full array", whereby only the more highly cost effective energy efficiency savings are targeted, the expected benefit-cost ratio would likely be higher. This approach would come with a "lost opportunity" cost not included in the higher B/C ratio. This is reflected in the overall benefit-cost ratio of the current programs administered through Efficiency Maine, 2.26, which is currently targeting only the more cost-effective investments. However, even this high B/C ratio, which results in net benefits to Maine residents and businesses on the order of \$12.7 million in 2005, is conservative because it is based on avoiding electricity supply costs that were computed in a 2003 study, prior to recent dramatic energy price increases.

Because of the increasing escalation of electricity prices in Maine and New England, caused primarily by rising natural gas and oil costs, the benefits of energy efficiency are even greater than shown in the Efficiency Maine 2005 annual report. A 2005 update to the Avoided Energy Supply Cost study conducted in 2003 suggests that energy efficiency avoids supply costs that are now approximately 1.5 times higher than the costs estimated in the 2003 study. This leads to an increase in the estimated B/C ratio, and resulting increases in net benefits to Maine residents and businesses as a result of the energy efficiency investments. The handout includes a table showing this.

When considering benefits of LD 1931, it is important to consider the leveraged investments created as a result of Efficiency Maine's programs. Most SBC-funded energy efficiency programs, other than low income programs, depend on some level of customer contribution to leverage the funds available from the charge. Efficiency Maine's programs also include significant customer contributions. The current C&I programs limit incentives to 35% of total costs; and the residential lighting program primarily uses trade ally promotion with a rebate for a small portion of the cost of compact fluorescent lamps. In 2005, Efficiency Maine's commercial and investment program invested \$1.59 million in incentive payments, while customers contributed \$5.19 million. This represents significant leveraging of the funds available for energy efficiency investment.

The average residence in Maine using 500 kWh per month or 6,000 kWh per year would see an increase in costs of \$9 per year if the maximum system benefit charge of 3 mills/kWh is instituted. The benefits available to the average residence as a result of an increased SBC come from two sources: 1) the savings seen from utilizing the residential programs currently offered, or those that may be added to Efficiency Maine's mix; and 2) the savings seen by all residents through reduced energy and capacity prices arising from reduced demand. In New England, market-based energy prices reflect the interplay of supply and demand, and all else being equal, are lower when demand is less.

Even minimal participation in the residential programs currently offered through Efficiency Maine allow for net benefits for the average Maine residential customer. The net savings seen from installing a single or a few compact fluorescent lamps in high use areas, for example, more than offset the annual system benefit charge. The state of technology of compact fluorescent lamps has improved dramatically over the years, and now a diversity of sizes and styles of compact fluorescent lamps is available to meet most residential lighting needs.

## **II. Maine Currently is Under-Investing in Energy Efficiency Compared with Other New England States**

Maine currently has the lowest system benefit charge among the six New England states, which range from 2 to 3 mills/kWh, compared with Maine's 1.5 mills. This has been the case for a number of years, as other New England states have maintained a higher level of SBC funding for electricity efficiency programs. This pattern of underinvestment in energy efficiency has resulted in Maine's cumulative energy efficiency savings (as of 2003) being dramatically lower than the other New England states.

It is not simply the rate and aggregate SBC funding level that should be examined to assess Maine's relative position with other states. One also should look at electricity energy savings as a percentage of total electricity usage. Based on an updated report issued by the American Council for an Energy Efficient Economy in 2005, Maine has seen cumulative annual savings of only 0.45% of its overall kWh sales, while neighboring New England states range from a low of 2.52% in New Hampshire to a high of 7.81% in Connecticut.

The underinvestment is also seen by examining the 2005 electricity savings reported by Efficiency Maine compared to total Maine electric consumption. Maine saved energy at a rate equal to approximately  $\frac{1}{4}$  of 1 percent of its consumption in 2005. Other New England states save .7 to .8 percent of annual consumption through their programs (excepting New Hampshire, which is also ramping up from a 2002 start). In general, cost effective energy efficiency programs can easily save, and have saved, on the order of 1% of retail electricity consumption. Maine's current SBC funding level is too low to capture those savings. The handout includes a table showing these comparative values.

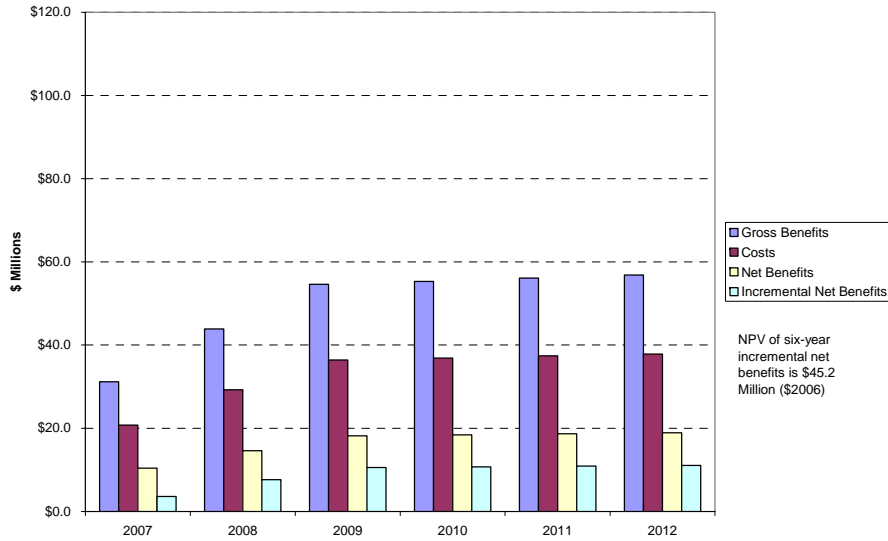
## **III. Concluding Statement**

Based on our experience in the energy sector and our regional perspective across New England, we conclude that Maine consumers would realize at least forty five million

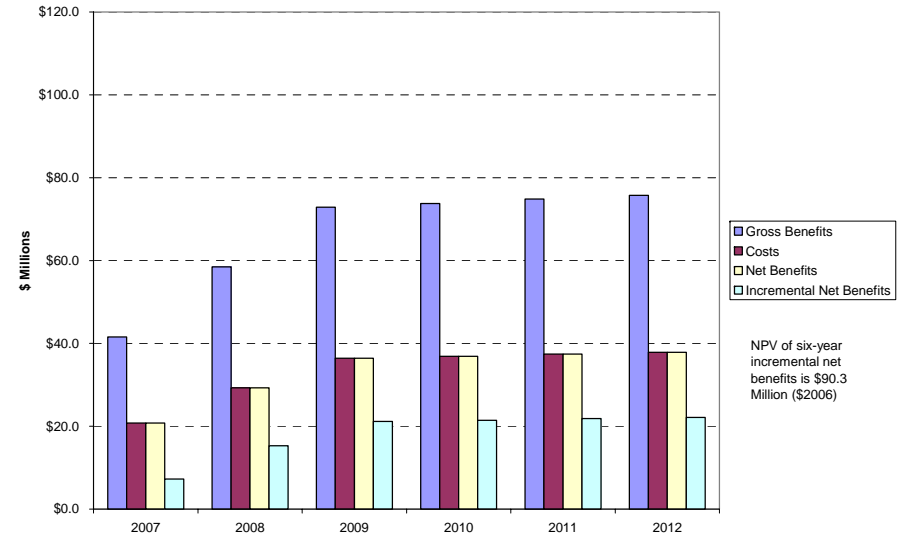
dollars and possibly over a hundred million dollars in savings in electricity costs (net present value) between 2007 and 2012 if the Efficiency Maine funding increases proposed by LD 1931 were implemented. We conclude that Maine is under-investing in electricity efficiency programs relative both to other New England states, and relative to the amount of cost-effective energy savings that could be readily achieved. Furthermore, the recent escalation in electricity prices makes energy efficiency investment an even greater buy. Also, Efficiency Maine appears to have a solid set of programs, but we believe that increased funding might 1) enable additional programs that we see operating effectively in other New England states, 2) enable existing programs to achieve greater economies of scale, and 3) enable a larger portfolio of programs to capture economies of scope, such as more efficient use of funding for administrative requirements that cut across all programs.

I appreciate this opportunity to provide comments and would be pleased to answer any questions that you may have.

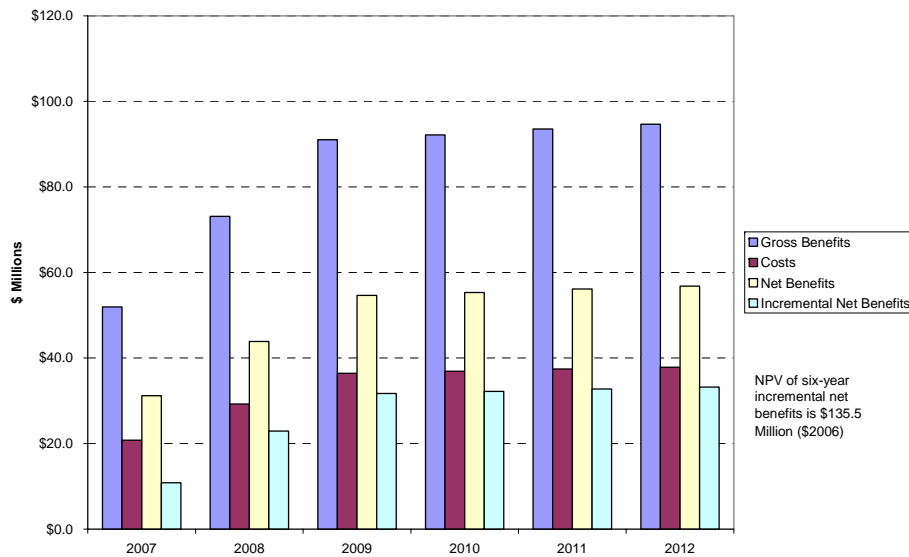
SBC Impacts at B/C=1.5, 2007-2012



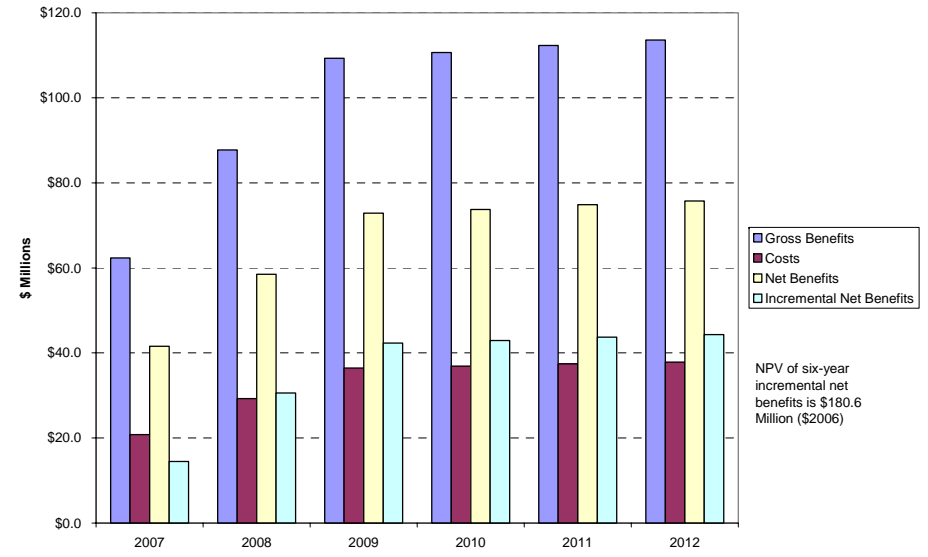
SBC Impacts at B/C=2.0, 2007-2012



SBC Impacts at B/C=2.5, 2007-2012



SBC Impacts at B/C=3.0, 2007-2012



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**Estimate of B/C Ratios for Increased Energy Efficiency Investment from Optimal Report (2002)  
and With Updated Avoided Energy Supply Costs**

*Existing "Constrained Funding" Scenario at \$15 Million/Year*

	B/C Ratio in 2002	Avoided Cost Multiplier	Updated B/C Ratio - Current
Residential Sector / Market	1.37	1.2	1.64
Commerical / Industrial Sector / Market	1.47	1.2	1.76
Total both Sectors / Markets	1.43	1.2	1.72

*"Maximum Achievable Potential" Scenario, Annual Expenditures Ramping Up to ~\$100 Million/year*

	B/C Ratio in 2002	Avoided Cost Multiplier	Updated B/C Ratio - Current
Residential Sector / Market	1.48	1.2	1.78
Commerical / Industrial Sector / Market	1.91	1.2	2.29
Total both Sectors / Markets	1.77	1.2	2.12

Sources:

Optimal Energy Inc., and VEIC, "The Achievable Potential for Electric Efficiency Savings in Maine" October, 2002  
Resource Insight and Synapse Energy, "Updated Avoided Energy Supply Costs", 2001

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**Updated B/C Ratio For Efficiency Maine 2005 Installation Programs**

Efficiency Maine Program	Annual Energy Savings, MWH	Program Costs	Program Benefits	B/C Using 2003 AESC	Benefits with Revised 50% Avoided Cost Increase	Revised B/C Using 2005 AESC
Low Income Appliance Replacement	3,387	\$1,480,328	\$2,684,122	1.8	4,026,183	2.7
Residential Lighting	5,637	\$1,631,000	\$2,631,000	1.6	3,946,500	2.4
Business	13,330	\$5,097,155	\$12,017,000	2.4	18,025,500	3.5
State Buildings	482	\$214,390	\$396,088	1.8	594,132	2.8

Sources:

Efficiency Maine 2005 Annual Report, and communciation from Denis Bergeron  
ICF Consulting, Avoided Energy Supply Costs in New England, December 2005 and August 2003  
Revised Computations by Synapse Energy Economics

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**Comparison of Maine Efficiency Metrics with Other States**

	Current System Benefits Charge, mills/kWh	Through 2003 Cumulative - Savings as a % of Annual Sales	Savings as a % of Annual Sales	Based on Year
Maine	1.5	0.45	0.25	2005
RI	2.3	6.18	0.8	2002
MA	2.5	5.76	0.7	2002
VT	2.9	4.77	0.8	2002
NH	3.0	2.52	0.1	2002-2003
CT	3.0	7.81	0.8	2002

Sources:

ACEEE, 3rd National Scorecard on Utility and Public Benefits Energy Efficiency Programs, Report No. U054, October 2005  
ACEEE, Five Years In: An Examination of the First Half-Decade of Public Benefits Energy Efficiency Policies, Report No. U041, April 2004  
Efficiency Vermont, 2005  
Connecticut Energy Conservation and Management Board, 2005  
Public Utility Commission websites