Energy Efficiency:
An Engine of Economic Growth

2010 IRP DSM Workshop

November 23, 2009

ENE
Environment Northeast

Why This Study Was Needed

- Other assessments only look at the direct costs and savings of the program to participants and ratepayers
- Need to understand the positive impacts of EE to the broader economy
- Encourage and reinforce treatment of efficiency by state leaders as an economic development tool

Why Efficiency Programs are Needed

- Correct market failures
  - Liquidity Constraints – inadequate access to capital
  - Split Incentives – EE investor does not receive savings benefits
  - Information Problems – uncertainty of future savings of today's investment
  - Behavioral Problems – complexity of decisions are beyond one's ability

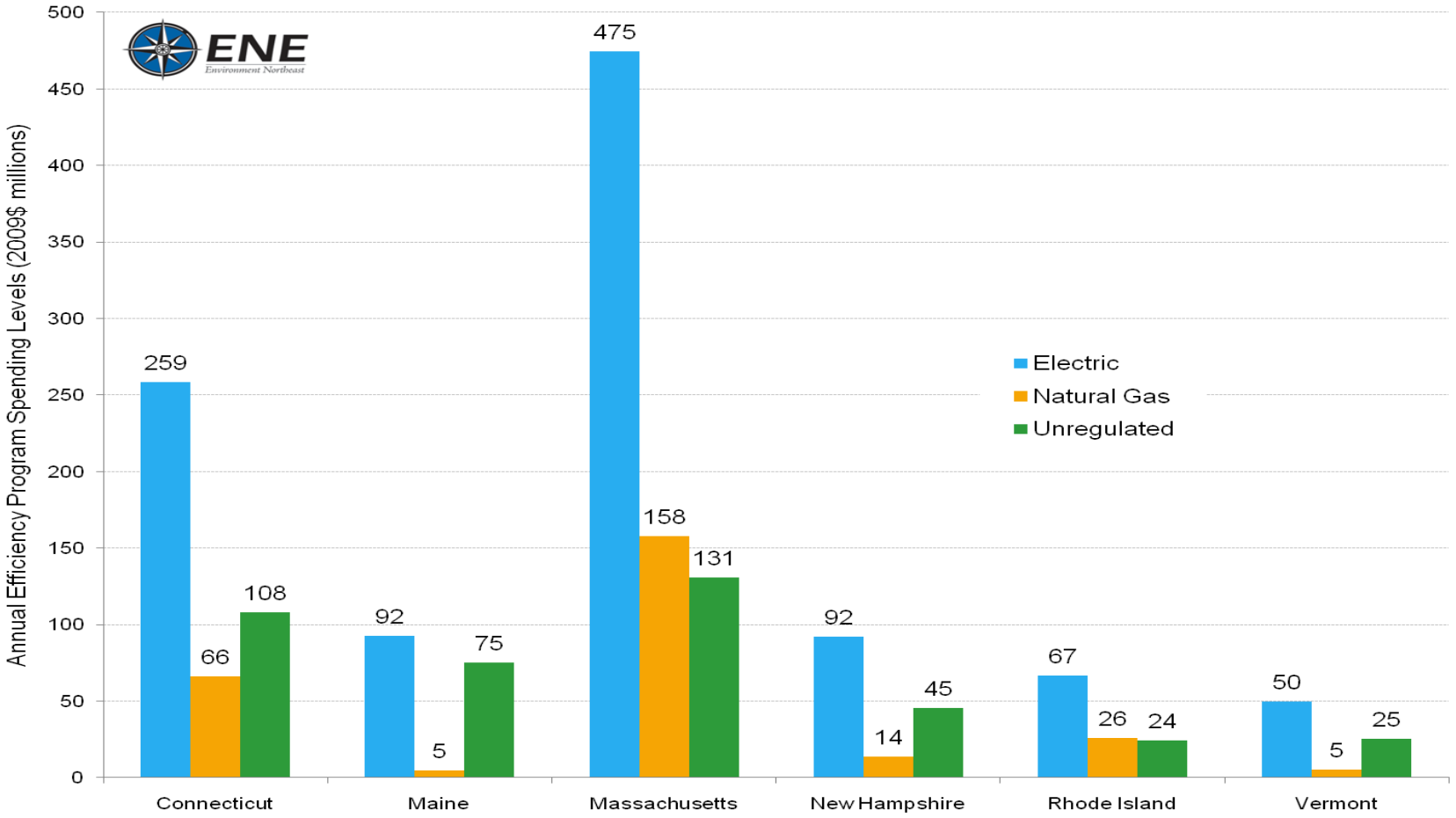
Methodology

- Energy cost and consumption model
  - EE spending levels near all cost-effective
  - Published forecasts of energy consumption and prices
  - Conservative estimates of future EE costs
  - Developed baseline and EE scenario projections
- Macroeconomic impacts modeled with REMI
  - REMI baseline forecast
  - Costs/savings from above used as input for EE scenario
  - EE jobs composition specified in model

REMI Model

- Utilized Regional Economic Models Inc (REMI), a multi-state *Policy Insight* forecasting tool
- This is the same system that was used to evaluate the economic impacts from the Regional Greenhouse Gas Initiative (RGGI)
- REMI allows the analyst to enter state-specific *annual* changes and then generate an economic forecast
- The model used forecasts for 70 different industries through the year 2038

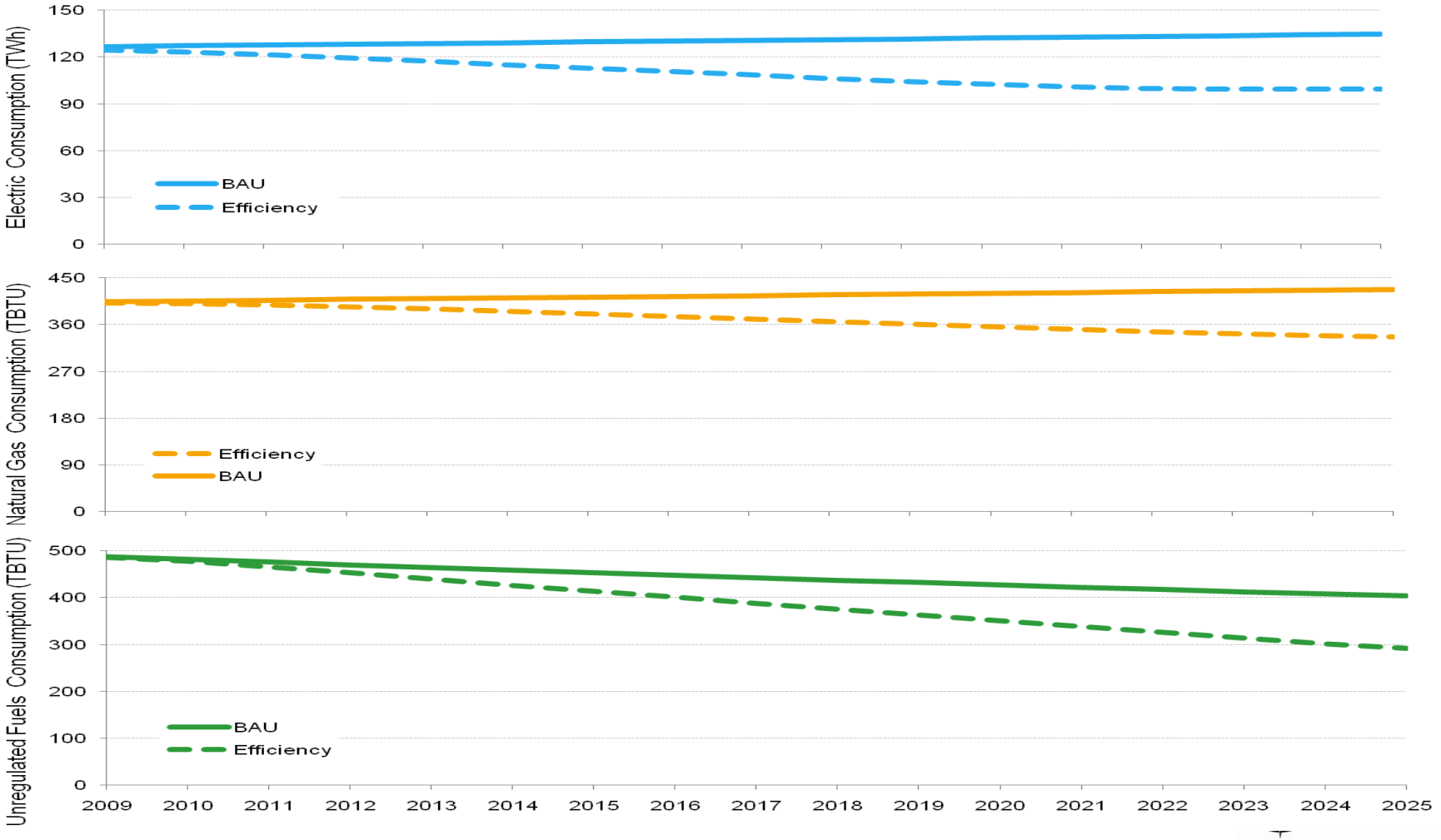
Efficiency Spending Levels



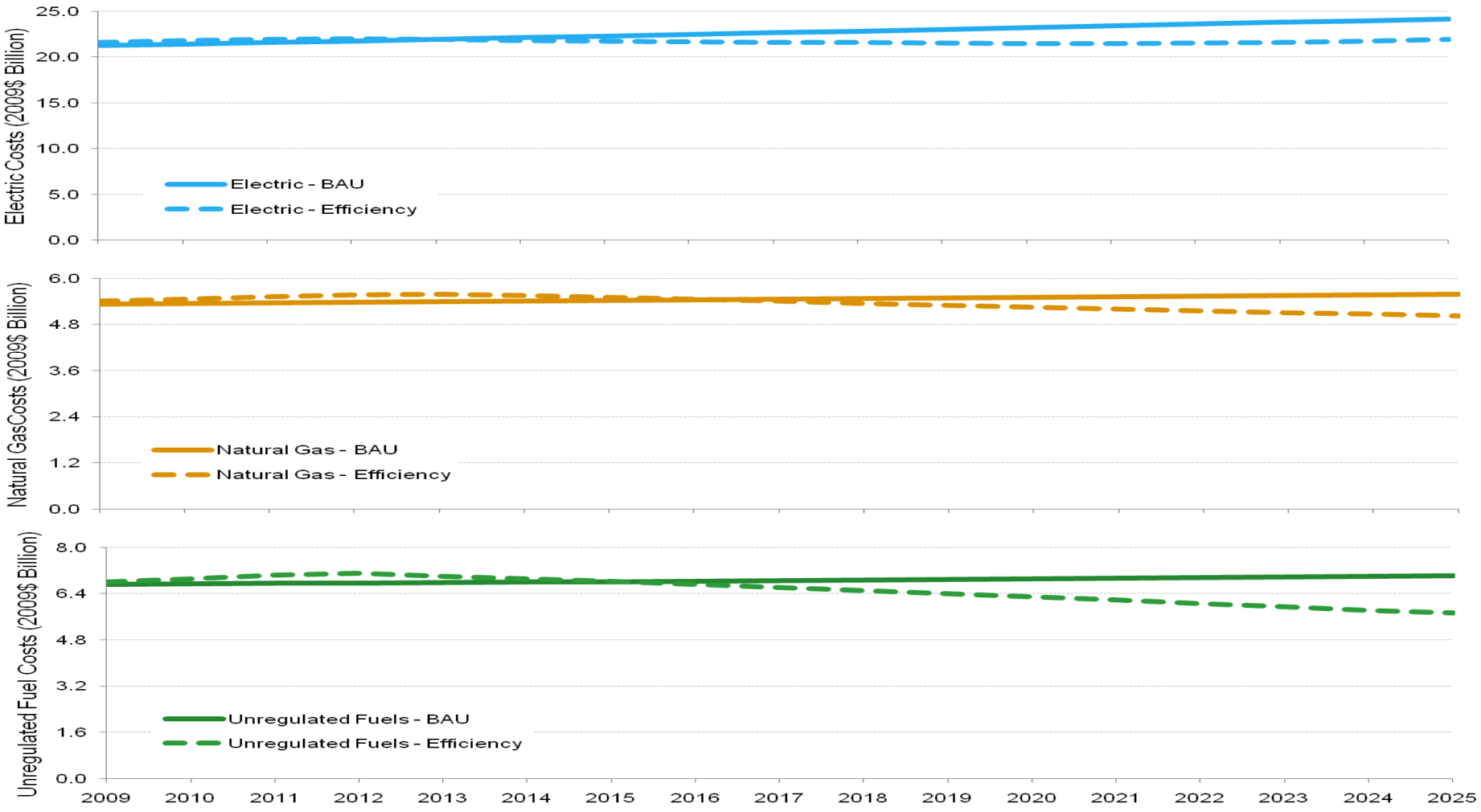
EE Modeled Characteristics

Electricity	**Residential**	**C&I**	**Units**
First-Year Program Costs per Annual Savings- Energy	425	375	$/MWh
Lifetime Program Cost per KWh	0.035	0.027	$/KWh
First-Year Program Costs - Capacity	3300	2500	$/KW
Average Participant Copay	12%	32%	%
Average Measure Life	12	14	Years
Natural Gas and Non-Regulated Fuels			
First-Year Program Costs per Annual Savings	80	30	$/MMBTU
Lifetime Program Cost per MMBTU - Energy	4.00	2.00	$/MMBTU
Average Participant Copay	20%	45%	%
Average Measure Life	20	15	Years

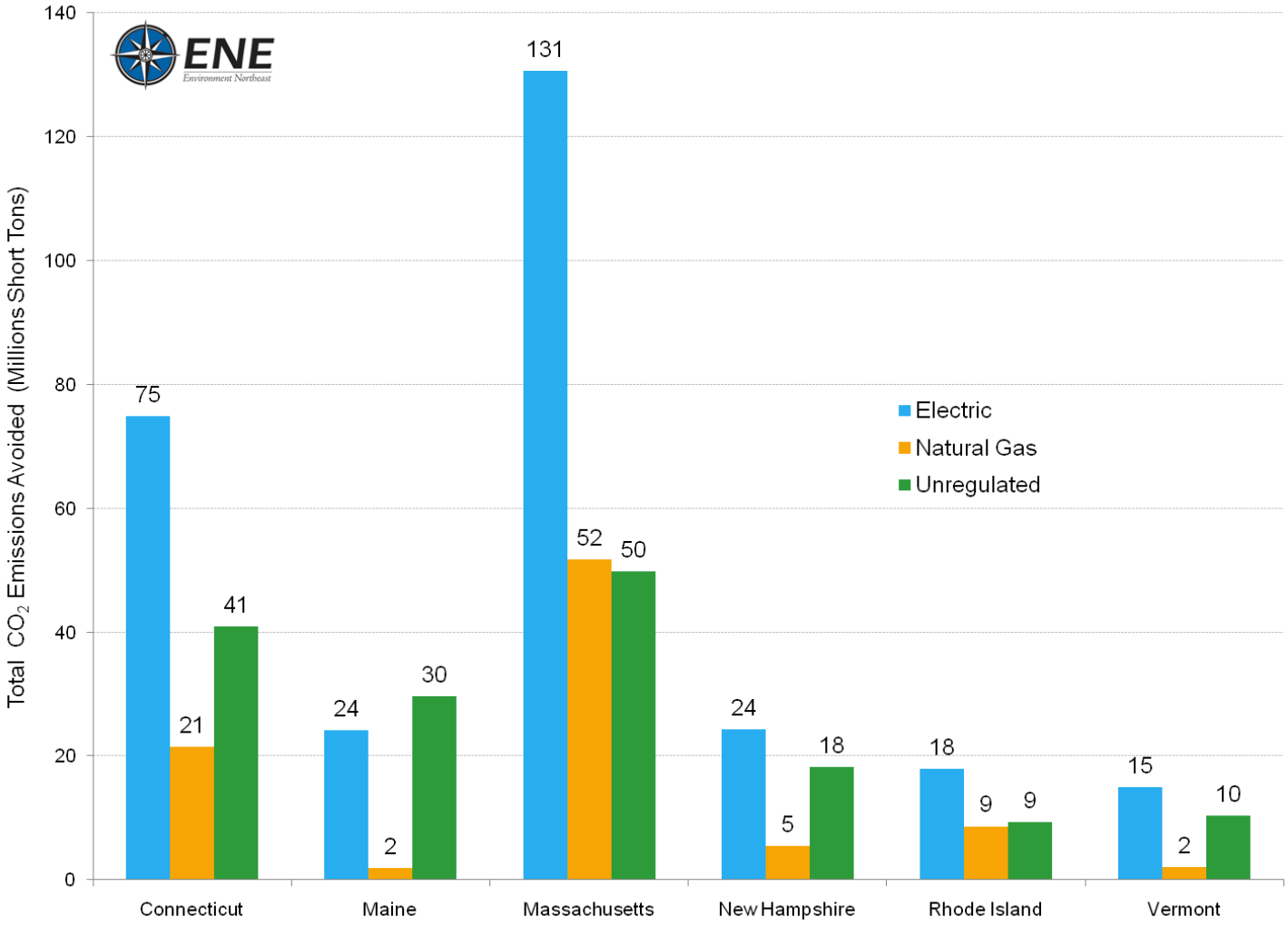
Results - Energy Savings



Results - Energy Cost Savings



Results - Emissions Reductions



New England Total Economic Impacts

	Electric	Natural Gas	Unregulated Fuels
Total Efficiency Program Costs ($Billions)	16.8	4.1	6.3
Increase in GSP ($Billions)	99.4	30.6	53.1
Maximum annual GSP Increase ($Billions)	5.6	1.8	2.9
Percent of GSP Increase Resulting from Efficiency Spending	12%	11%	9%
Percent of GSP Increase Resulting from Energy Savings	88%	89%	91%
Dollars of GSP Increase per $1 of Program Spending	5.9	7.4	8.5
Increase in Employment (Job Years)	767,011	207,924	417,061
Maximum annual Employment Increase (Jobs)	43,193	12,907	24,036
Percent of Employment Increase from Efficiency Spending	16%	15%	12%
Percent of Employment Increase from Energy Savings	84%	85%	88%
Job-Years per $Million of Program Spending	46	50	66

Connecticut Results Summary

	Electric	Natural Gas	Unregulated Fuels
Energy Savings	**(GWh)**	**(TBTU)**	**(TBTU)**
Maximum annual savings	8,600	22	29
Maximum savings vs. Business as Usual	25%	20%	28%
Lifetime savings (15 years of programs)	125,900	272	368
Equivalent GHG Emissions Avoided	**(Millions short tons)**	**(Millions short tons)**	**(Millions short tons)**
Maximum annual avoided emissions	4.3	1.3	2.3
Maximum annual avoided emissions vs. 2005 total Connecticut Emissions	9.7%	2.9%	5.2%
Lifetime avoided emissions (15 years of programs)	72	21	41

Connecticut Economic Impacts

	Electric	Natural Gas	Unregulated Fuels
Total Efficiency Program Costs ($Billions)	4.4	.93	1.6
Increase in GSP ($Billions)	25	6.6	12
Maximum annual GSP Increase ($Billions)	1.37	0.41	0.65
Percent of GSP Increase Resulting from Efficiency Spending	11%	10%	8%
Percent of GSP Increase Resulting from Energy Savings	89%	90%	92%
Dollars of GSP Increase per $1 of Program Spending	5.7	7.0	7.1
Increase in Employment (Job Years)	183,000	42,000	78,000
Maximum annual Employment Increase (J obs)	9,700	2,700	4,600
Percent of Employment Increase from Efficiency Spending	15%	14%	11%
Percent of Employment Increase from Energy Savings	85%	86%	89%
Job-Years per $Million of Program Spending	41	45	48

Conclusions

- Experience shows that mandates and incentives are needed to overcome barriers to investing in efficiency
- This study shows that the economic benefits of EE investments are much greater than typically calculated
- Results should encourage states to expand programs to capture all cost-effective efficiency for all fuels