

State Energy Office Program Funding Impacts



Energy Policy Council Meeting
Raleigh, NC
September 16, 2004

Overview

Goals

Economic model of the North Carolina economy used to estimate

- (1) energy savings,
- (2) emissions reductions,
- (3) state economic impacts, and
- (4) jobs impacts

Based on three years of SEO programs (FY 01 – 03)

Outline

1. Programs summary
 - Funding history
 - Types of programs
2. Impacts analysis
 - Model overview
 - Summary impacts
 - Interesting findings

SEO Programs Summary

- Vast majority of funds were dispersed in the form of grants.
- Generally grant programs can have the goal of either:
 - (1) Market transformation, i.e., long-term OR
 - (2) energy savings, i.e., short-term.
 - Most NC SEO programs aim for market transformation effects.
- Therefore
 - Can view energy savings results as conservative
 - Can expect savings to continue to accrue well beyond the end of spending, which is 2003 in this case

Review of the Program Types

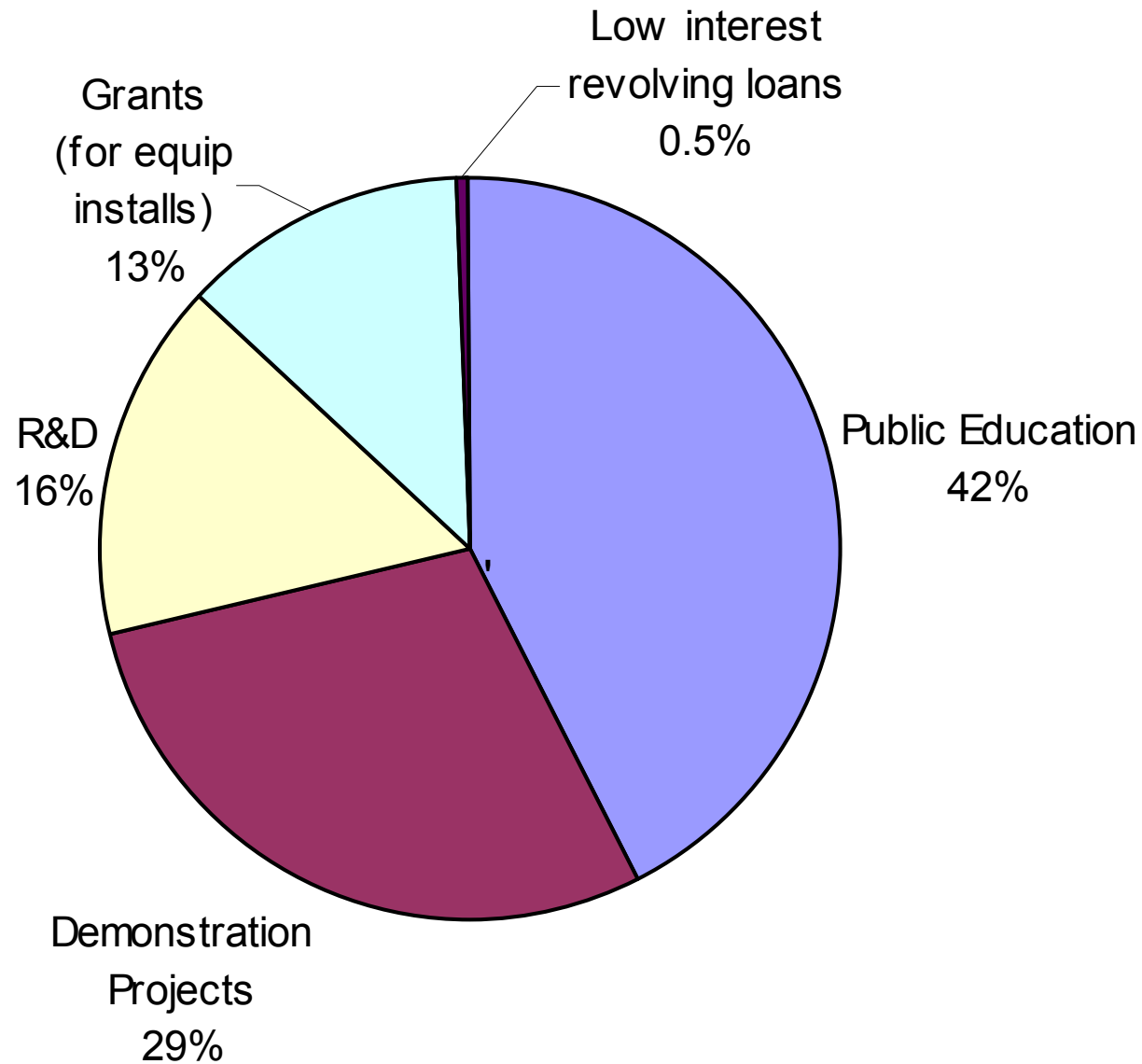
- Public Education
- Demonstration Projects
- R&D
- Grants (for equipment installation)
- Low interest revolving loans

Summary of Program Expenditures FY 2001-03

Program Type	Funding FY 2001-03
Public Education	\$4,682,445
Demonstration Projects	\$3,165,661
R&D	\$1,722,119
Grants (for equip installs)	\$1,399,178
Low interest revolving loans	\$49,954
TOTAL	\$11,019,357

* These are three year totals.

SEO Programs FY 2001 – 03 by Type



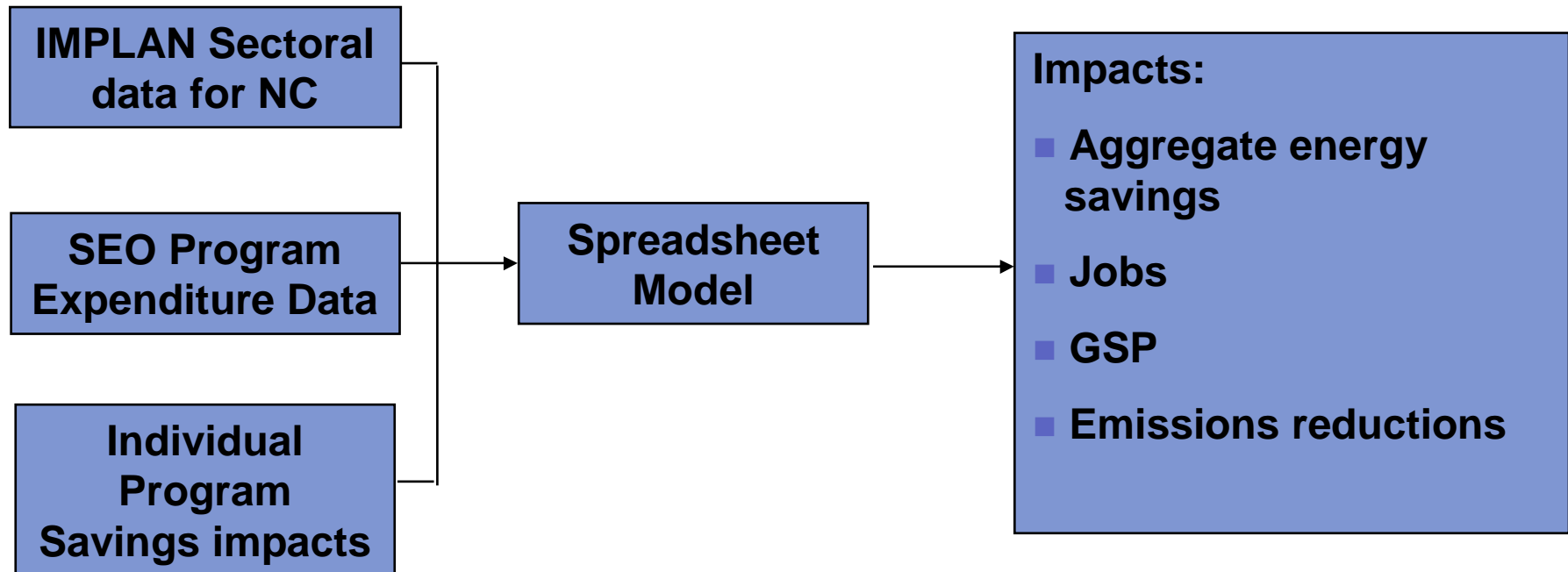
Impacts Analysis

- Energy savings impacts
- Emissions impacts
- Jobs impacts
- State economic impacts (Δ GSP)

Model overview

- Goal is to understand how programs impact **North Carolina**
 - IMPLAN data allows tailored view of how energy investment decisions (by state gov., private industry, or households) lead to changes in:
 - Energy use
 - Emissions reductions
 - Job growth
 - Gross State Product (GSP)
 - Allows us to begin to answer the basic questions:
 - “What are the near- and long-term impacts (and thus value) of these programs?”
 - “Are we sacrificing jobs and growth for energy savings?”
- Economic model of NC economy based on standard sectoral data maintained by IMPLAN.
 - Minnesota IMPLAN Group: Leading national economic data analysis firm. Maintain updated sectoral data at national, state, and county levels.
 - State level data used for our analysis here
 - Spreadsheet model then used to input energy program data and output the impacts we are interested in.

Model Overview (con'd)



Impacts Summary

- Background:
 - Data from Fiscal Years 2001, 2002, 2003 used. Most recent years for which there is comprehensive data.
 - Only consider impacts of program spending in these three years
 - Residual impacts of past years are NOT counted.
 - Therefore conservative estimates of total SEO impacts.
- Why?
 - Set a baseline against which we can consider future funding levels and scenarios (PBF?)
 - Same model and basic economic data used here for historical impacts as with the PBF scenario analysis → Consistency!

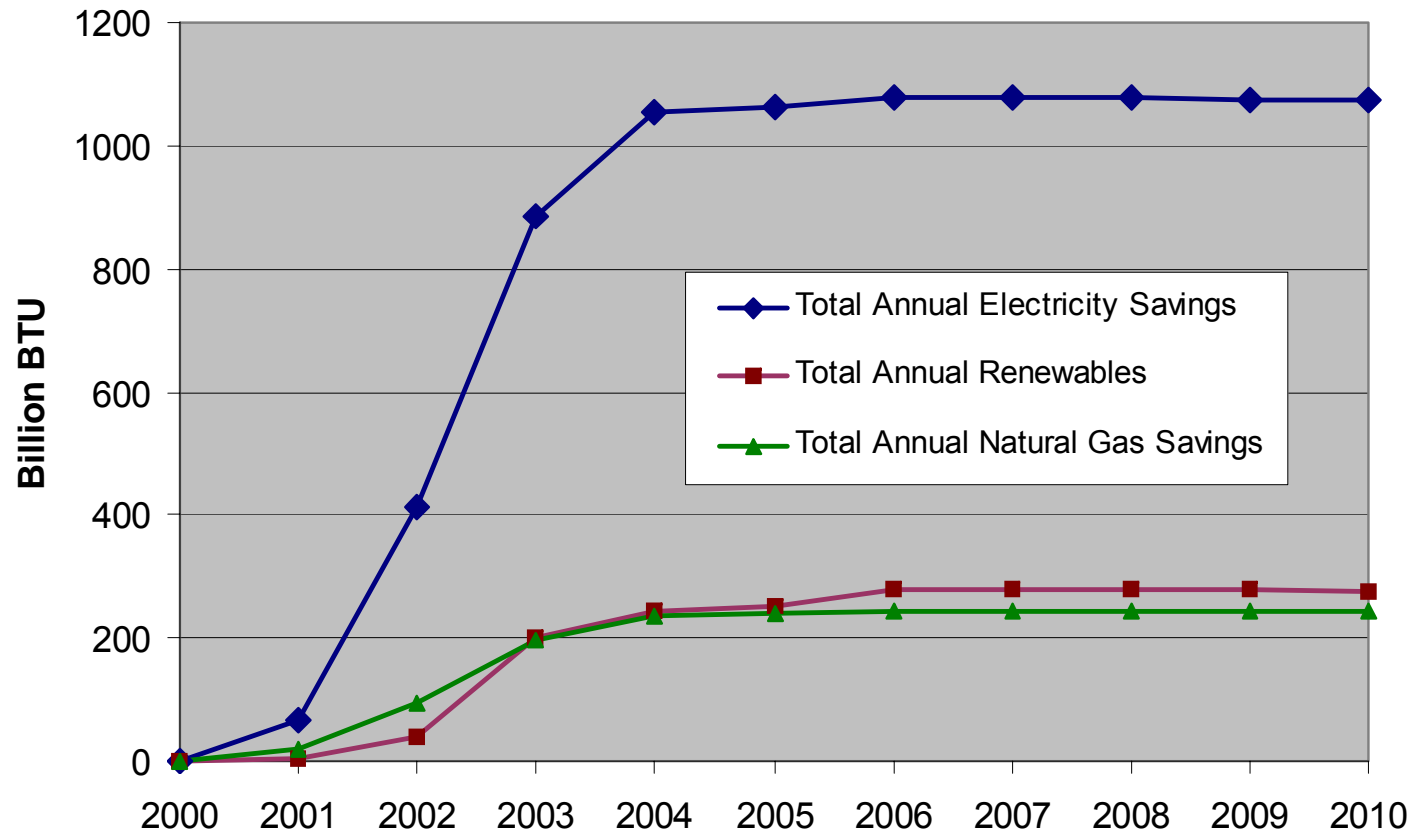
Impacts Summary (con't)

- Intuitive understanding:
 1. \$1 spent in 2001 by SEO →
 2. Some level of private investment in that year or following year (\$0.25? \$3.00? – depends on type of program)
 3. SEO \$ + Private \$ → Investment that leads to real energy savings in 2001 or 2002 . . .
 4. Energy savings continue through 2010 (cumulative impacts), e.g., improved insulation installed in 2001 will continue to generate savings indefinitely.
 5. The combination of **energy investments & energy savings** lead to **jobs, wages, and GSP impacts**.

Impacts Summary

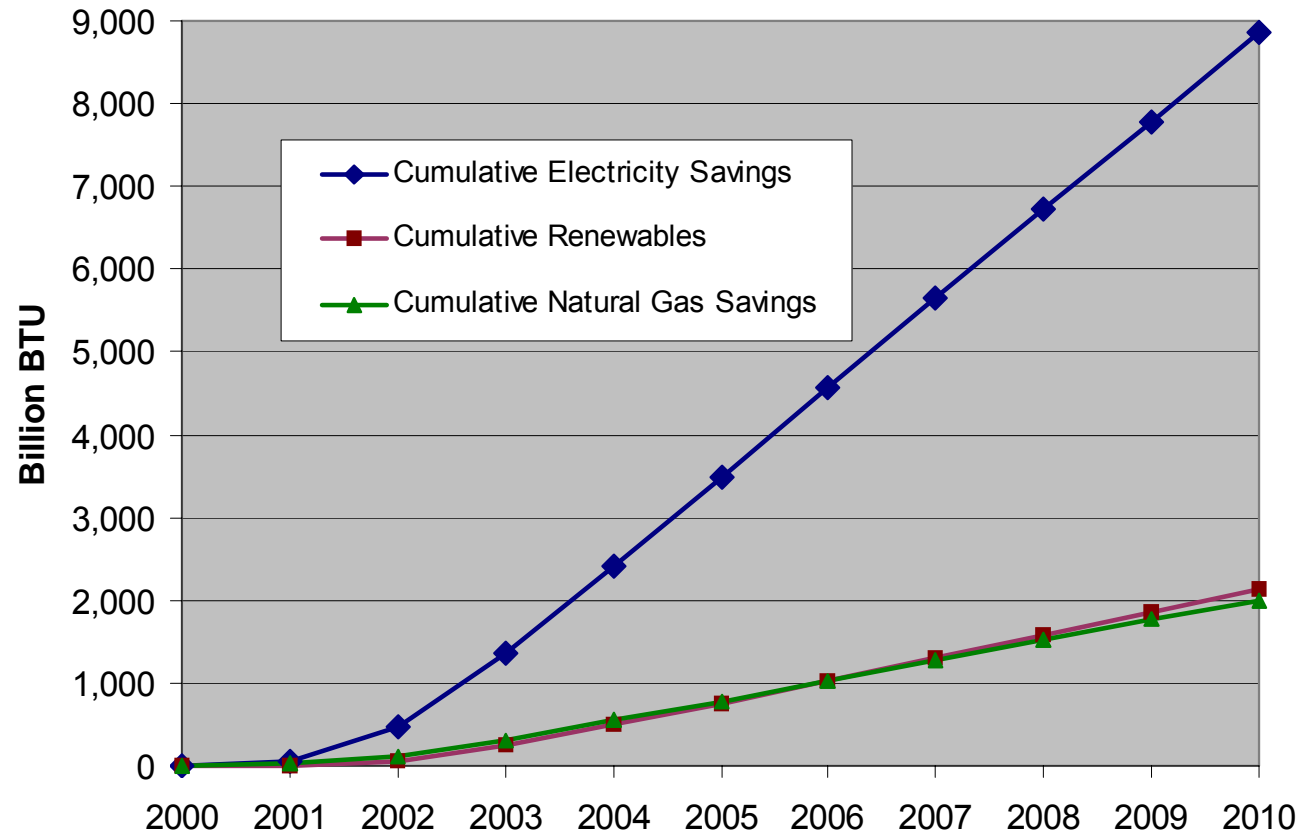
- Energy Savings
 - Annual
 - Cumulative
- Emissions reductions
 - SO₂, NO_x, CO₂
- Wages and Gross State Product (GSP)
 - Annual
 - Cumulative
- Job growth
 - Annual
 - Cumulative

Annual Energy Savings from FY 2001-03 Programs



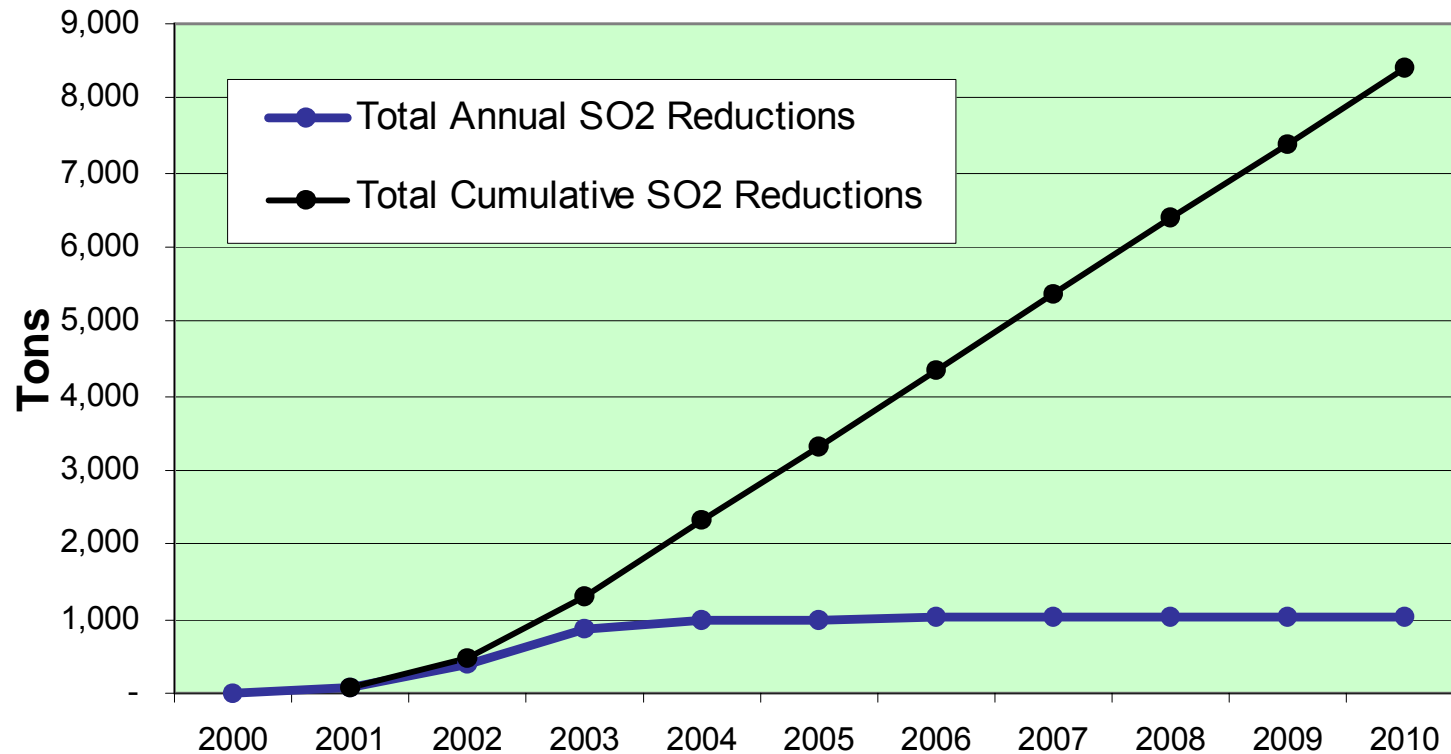
■ Note: All savings converted to Billion BTU for consistency.

Cumulative Energy Savings from FY 2001-03 Programs



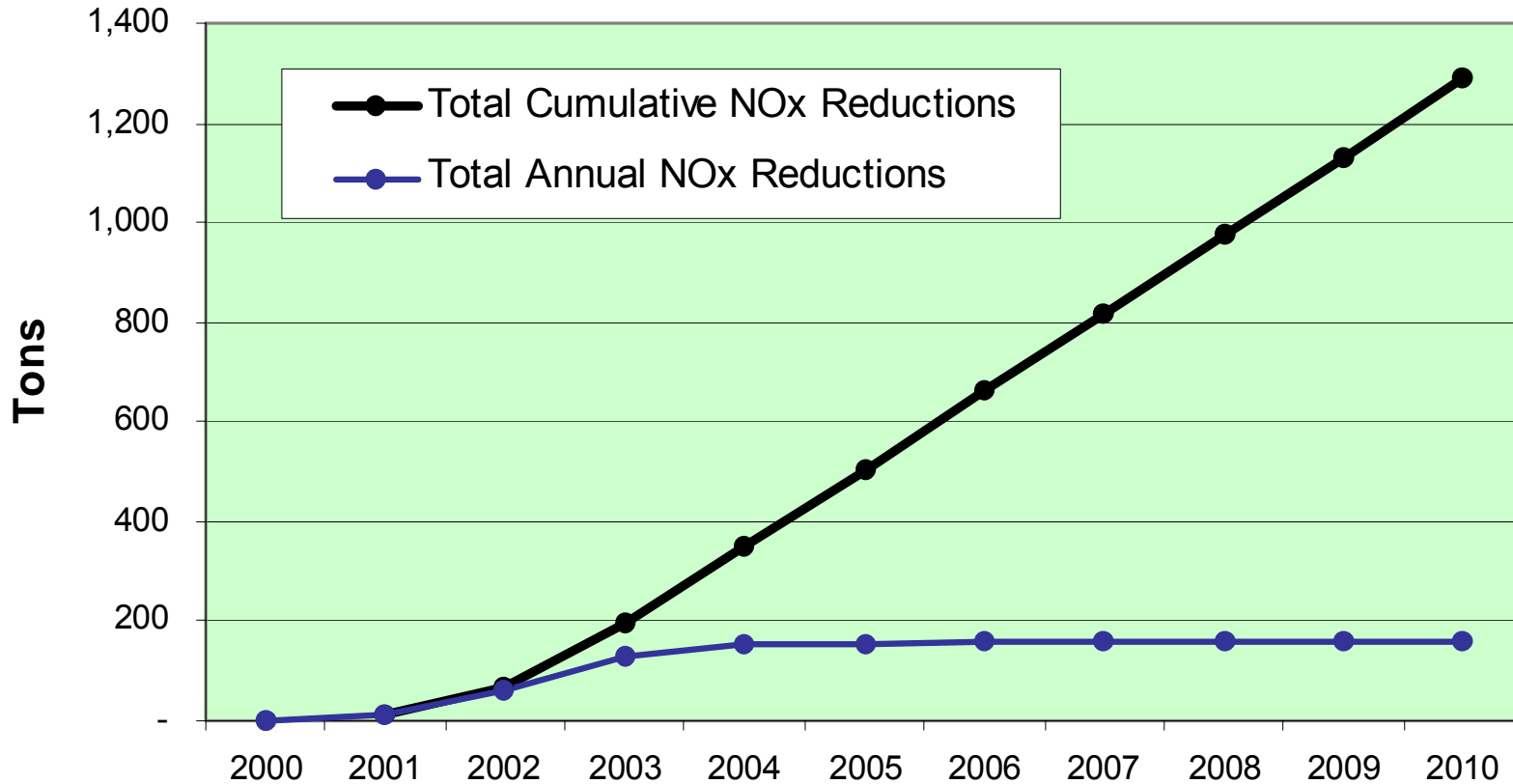
- Total cumulative electricity savings reach 8,866 BBTU
- Renewable energy = 2,129 BBTU and Natural Gas savings reach 2,002 BBTU
- Total combined cumulative savings of 12,997 BBTU or 1,287 GWh.
- Roughly equivalent to a third of the annual output of a coal-fired power plant or the annual electric use of approximately 160,900 homes.

Emissions reductions: SO₂



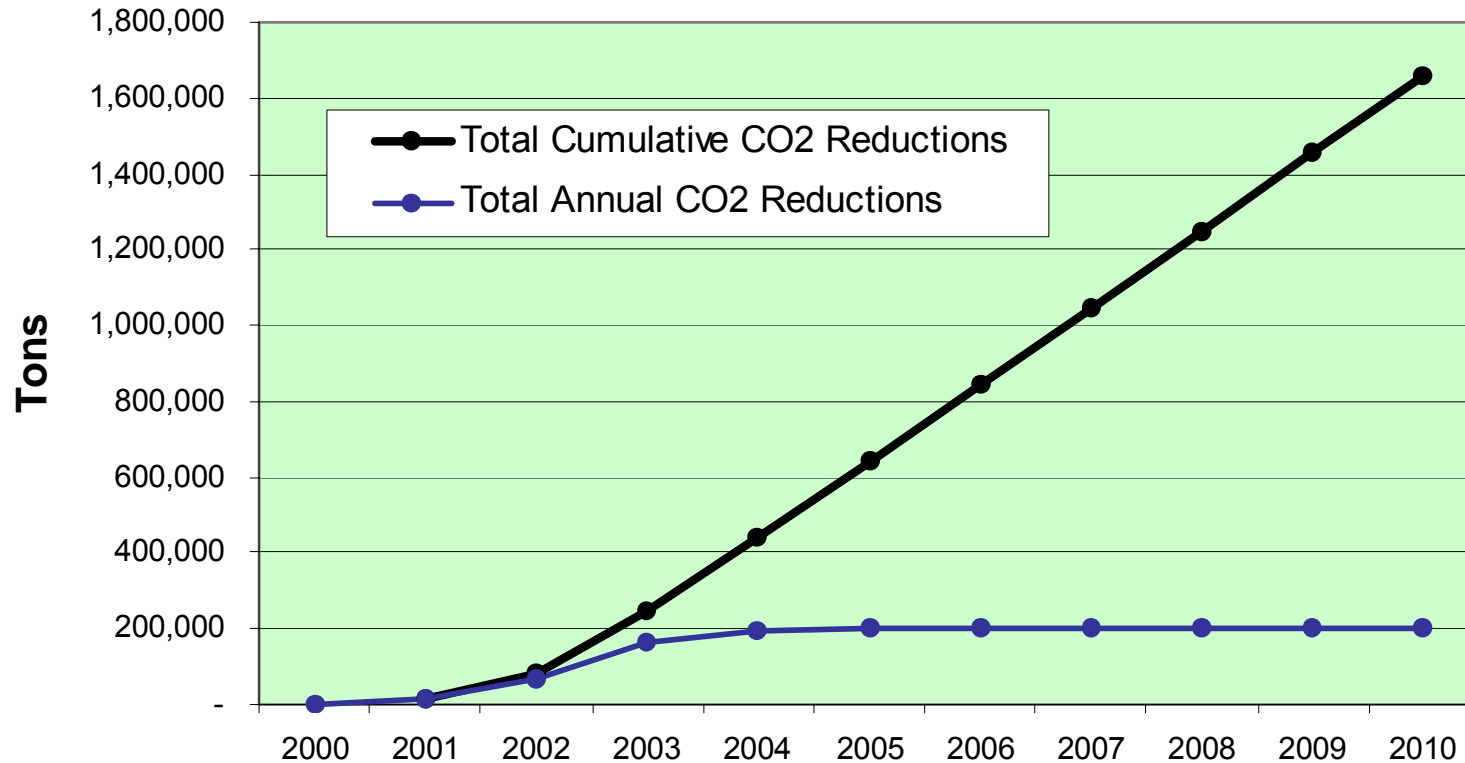
- Cumulative SO₂ emissions reductions reach a total of over 8,000 tons by 2010.
- Annual SO₂ emissions reductions level off after the end of SEO program spending.

Emissions reductions: NO_x



- Cumulative NO_x emissions reductions reach a total of over 1,200 tons by 2010.
- Annual NO_x emissions reductions level off at 154 tons.
- Annual total is equivalent to taking approximately 16,600 cars off the road.

Emissions reductions: CO₂



- Cumulative CO₂ emissions reductions reach a total of over 1,658,000 tons 2010.
- Annual CO₂ emissions reductions reach approximately 200,000 tons per year.
- Annual total is equivalent to taking 32,800 cars off the road.

Bill Savings

North Carolina's annual bill savings (million \$, 2000)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Electricity											
Residential	0.28	1.04	1.77	1.85	1.84	1.82	1.80	1.77	1.75	1.73	15.7
Commercial	0.06	0.44	1.23	2.01	2.01	2.04	2.01	1.99	1.96	1.94	15.7
Industrial	0.08	0.90	1.93	2.04	2.07	2.13	2.14	2.16	2.18	2.20	17.8
Natural Gas											
Residential	0.03	0.27	0.45	0.47	0.46	0.46	0.46	0.46	0.46	0.46	4.0
Commercial	0.10	0.11	0.30	0.49	0.48	0.49	0.49	0.49	0.49	0.49	3.9
Industrial	0.00	0.22	0.46	0.48	0.48	0.50	0.51	0.52	0.53	0.55	4.3
Total Consumer Savings	0.54	2.97	6.15	7.34	7.34	7.43	7.41	7.40	7.38	7.36	61.3

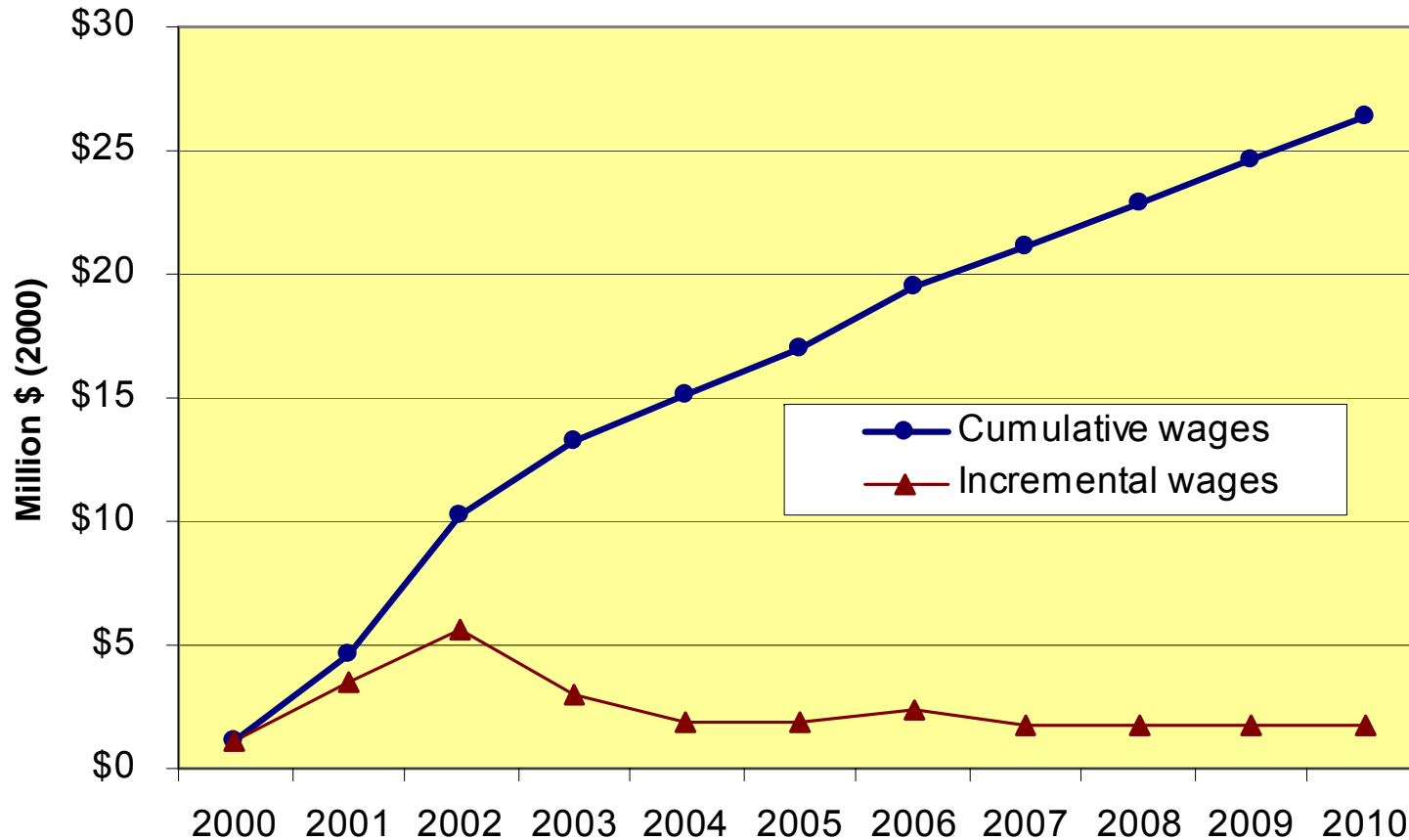
- Total cumulative bill savings of \$61.3 million (in 2000 dollars) by 2010.
- Based on SEO programs in FY 01-03.

Stimulated investment

Private Investment in Energy Efficiency and Renewable Energy Stimulated by SEO Programs FY 2001-03 (million 2000 \$)

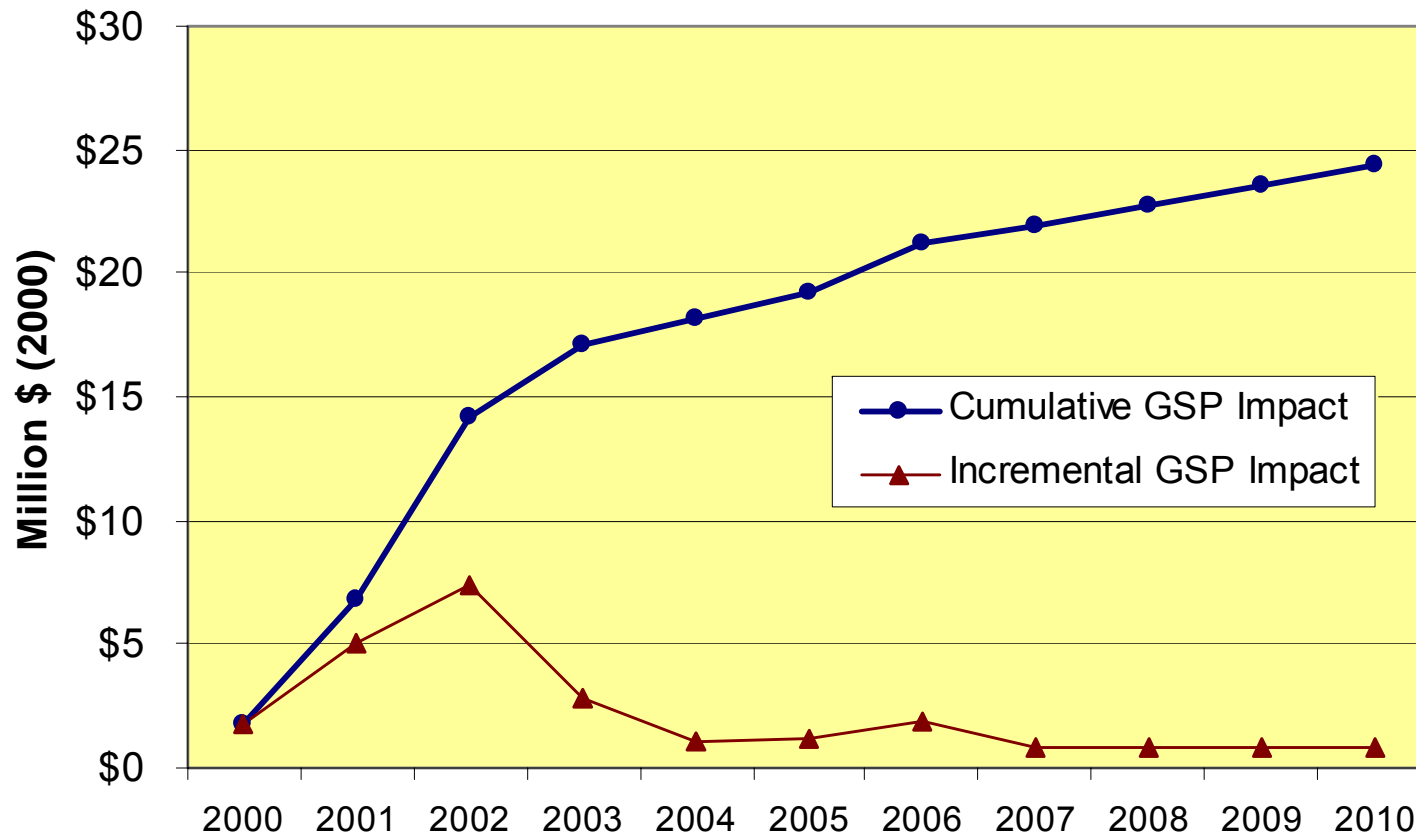
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Private Investment											
Residential	1.3	2.2	3.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	6.9
Commercial	0.2	0.8	1.2	0.0	0.1	0.2	0.0	0.0	0.0	0.0	2.5
Industrial	0.3	2.5	3.3	0.0	0.1	0.1	0.0	0.0	0.0	0.0	6.3
Utilities	0.3	1.0	2.8	0.3	0.5	1.7	0.0	0.0	0.0	0.0	6.6
Total Private Investment	2.0	6.4	10.7	0.4	0.7	2.0	0.0	0.0	0.0	0.0	22.3

North Carolina Wage Impacts



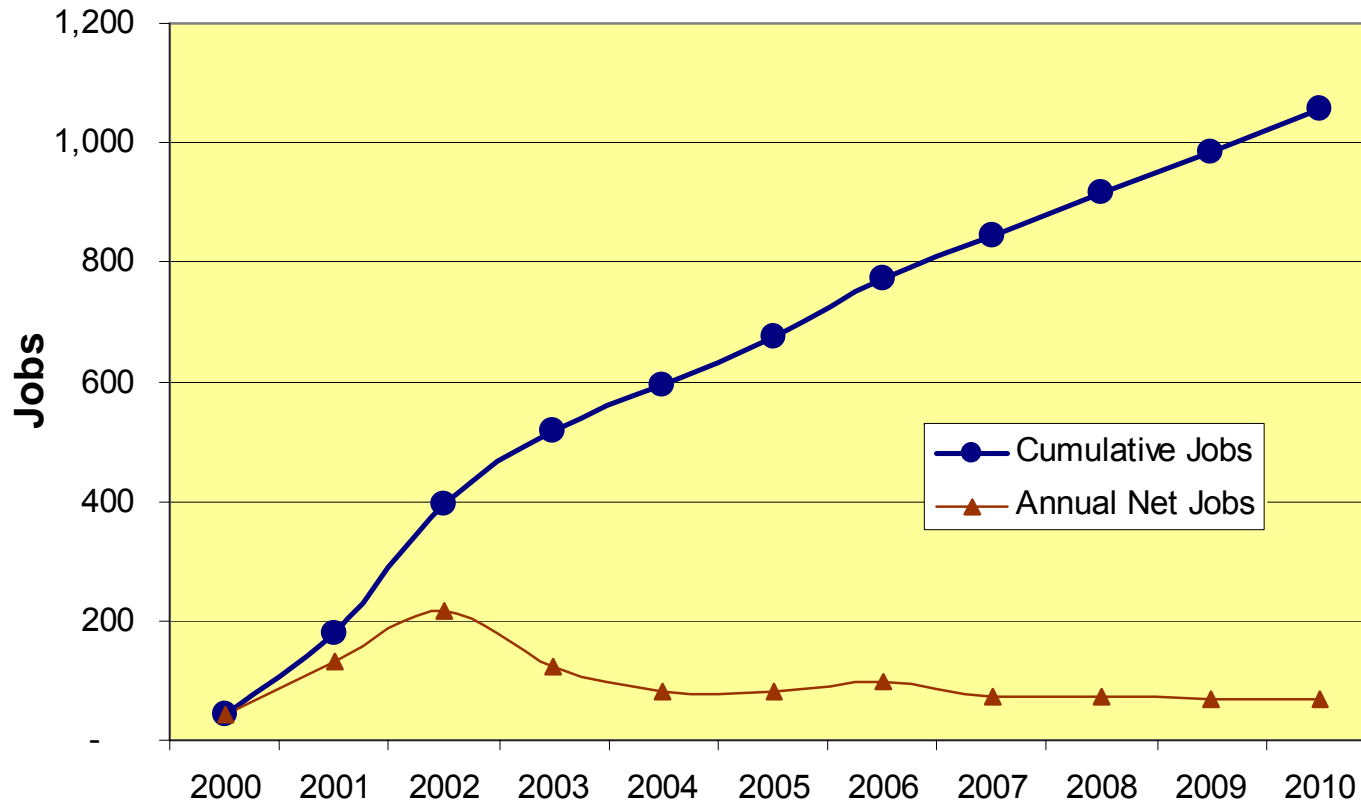
- Refers to the total net gain in wage and salary compensation; it is the additional amount paid to labor as a result of SEO program spending.
- Total cumulative impact on wages = \$26.4 million
- Average annual increase in wages of \$2.4 million

North Carolina Gross State Product Impacts



- Cumulative impact to GSP over the ten-year horizon is \$24.3 million.
- Compare to total of \$11 million (in 2000 dollars) spent by the SEO over the three program years.
- Impacts greatest in the years of program implementation, with average annual increases in GSP of \$2.21 million.

North Carolina Net Job Growth



- Total projected net job creation is 1,050 jobs over a ten-year period.
- Largest annual increases in job numbers are in the early years when program funds are being spent.
- Rate of new job creation declines beyond the selected program years, but net job growth continues through 2010.

Summary

- \$11,019,357 = total spent on all SEO programs in FY 2001 – 2003.
- Energy Savings:
 - Led to energy savings of 1,258 billion BTU by 2003
 - Projected to save NC 1,569 billion BTU *per year* by 2010
 - Cumulative total savings of 12,997 billion BTU (1,287 GWh) by 2010
 - Total end user bill savings of \$61.3 million projected by 2010
(residential, industrial, commercial)
- Emissions Reductions:
 - SO₂: Annual reductions reach 1,002 tons; Cumulative = 8,260 tons
 - NO_x: Annual reductions reach 154 tons; Cumulative = 1,263 tons
 - CO₂: Annual reductions reach 200,615 tons; Cumulative = 1,629,621 tons

Summary (con't)

- Wages and GSP
 - \$12 million in wage increases by 2003 and \$25.2m projected by 2010
 - \$15 million in GSP increase by 2003 and \$22.3m projected by 2010
- Jobs
 - Total of 1,015 net jobs projected through 2010
- Energy programs continue to accrue energy savings and economic benefits beyond end of program life, but rates of increase decline once spending stops.