

GENERAL ASSEMBLY OF NORTH CAROLINA



Session 2007

Legislative Fiscal Note

BILL NUMBER: Senate Bill 668 (Third Edition)

SHORT TITLE: Energy Conservation in State Buildings.

SPONSOR(S): Senator Cowell.

FISCAL IMPACT					
	Yes (X)	No ()	No Estimate Available ()		
	<u>FY 2007-08</u>	<u>FY 2008-09</u>	<u>FY 2009-10</u>	<u>FY 2010-11</u>	<u>FY 2011-12</u>
EXPENDITURES:	Please refer to the Assumptions and Methodology Section for additional information on the fiscal impact of this bill. A summary table of potential impacts discussed in this memorandum can be found at the end of the note.				
DOA (Positions)	\$365,787	\$347,337	\$347,337	\$347,337	\$347,337
POSITIONS (cumulative):	4	4	4	4	4
PRINCIPAL DEPARTMENT(S) & PROGRAM(S) AFFECTED: All State agencies and the System of Community Colleges.					
EFFECTIVE DATE: This act becomes effective only if funds are appropriated during the 2007 General Assembly to implement this act and if funds are appropriated it becomes effective December 1, 2007. Sections 1.1 and 1.2 apply to contracts for the design of major facility projects, as defined in G.S. 143-135.36 as enacted in Section 1.1 of this act, that are entered into on or after December 1, 2007. Section 4.1 applies to life-cycle cost analyses commenced, and to contracts entered into for life-cycle cost analyses, on or after December 1, 2007.					

BILL SUMMARY:

S668 is divided into four Parts. Each Part is discussed below.

PART I. Creates a new Article 8C in Chapter 143, Energy and Water Efficient Public Buildings, to require new State, university, and community college buildings and major renovations of these buildings to use energy and water efficient construction standards. Prohibits the State from acquiring by purchase buildings that did not meet applicable energy efficiency standards at the time of construction or renovation.

- Included in the definitions section (G.S. 143-135.36), S668 defines "ASHRAE 90.1-2004" as the energy efficiency standard developed by the American Society of Heating, Refrigerating and Air Conditioning Engineers; "Major facility project" means a

construction project larger than 20,000 gross square feet of occupied or conditioned space or a building renovation project when the cost is greater than 50% of the insurance value and the project is larger than 20,000 gross square feet of occupied or conditioned space.

- G.S. 143-135.37 requires all major facility projects to be designed, constructed, and certified to at least 30% greater energy efficiency standards than ASHRAE 90.1-2004, and 20% greater energy efficiency for major renovations. Water systems must be designed and constructed to use 20% less potable water than the indoor water use baseline after meeting the 2006 North Carolina plumbing Code. Outdoor potable water or harvested ground water consumption must be reduced by 50% over conventional means. These provisions apply only to major facility projects that have not yet entered the schematic design phase.
- Public agencies must monitor and document ongoing operating savings and report annually to the Department of Administration on these savings. If the average building energy or water consumption over two years following beneficial occupancy is 85% or less than the performance goals established by the applicable standards, the designer, owner agency, contractor, Construction Manager at risk and commissioning shall investigate, determine the cause of the shortfall, and recommend corrections or modifications to meet the performance goals. Reports under G.S. 143-135.37 and G.S. 143-135.39 are to be consolidated by the Department into one report by November 1 of each year beginning in 2008 and submitted to the General Government Appropriations Subcommittees, the Environmental Review Commission, and the Joint Legislative Commission on Governmental Operations. The report shall include recommendations on the ongoing implementation of the Article.
- G.S. 143-135.38 authorizes the Department to issue guidelines and adopt rules to implement the Article. Public agencies may hold a preproposal conference for prospective bidders to discuss the standards.
- Requires the Department to create an energy efficient buildings advisory committee to provide advice on the Article's implementation, including recommendations regarding an education and training process on the Article and water and energy efficiency requirements. After reviewing the committee's recommendations, the Department must develop levels of education and training requirements for suitable for each of the following: (1) chief financial officer of a public agency; (2) the facility manager of each public agency responsible for the payment of the agency's utilities; (3) capital project coordinator of a public agency and (4) architects and mechanical design engineers involved in the design of projects under the Article.
- As provided in the new G.S. 143-135.39, when the Department, public agency, and the design team determine that the ASHRAE standard is not practicable, then the State Building Commission must determine if the standard is not practicable and, if not, which standard is practicable. If ASHRAE is not followed, the public agency and the State Building Commission must report this information and the reasons to the Department. (See G.S. 143-135.37)

- The Department must monitor the development of construction or other energy efficiency standards to determine if other standards would better fulfill the intent of the Article. The Department is also specifically charged with following the development of improved energy standards by ASHRAE and whether these standards or any other standard is adopted by the State Building Code Council. The Department must report on its monitoring under this section no later than January 1, 2009 and again on January 1, 2010.
- The Department is also charged with conducting a performance review of the energy and water efficient buildings program identifying costs, savings, impacts on employee productivity and the program's effectiveness and make a preliminary report no later than December 1, 2010 and a final report no later than December 1, 2011.
- G.S. 146-23.2 is amended to prohibit state agencies from purchasing any building, or building that had a major renovation, that was not designed and constructed to meet energy efficiency standards of a comparable State building or renovation of a State building in effect at the time the building was constructed or renovated.

PART II. Authorizes the Department to administer a program retrofitting existing State and university buildings with energy conservation measures that have a high return in energy savings and that require no significant expenditure of funds.

- Section 2.1(a) of the bill requires the Department of Administration to administer and oversee implementation of a program fully implementing the energy conservation measures defined in G.S. 143-64.17 in each State, university and community college building no later than December 31, 2009. G.S. 143-64.17 defines "energy conservation measure" as a "facility alteration, training, or services related to the operation of a facility, when the alteration, training, or services provide anticipated energy savings." Measures to be implemented under the bill include: (1) lighting system changes; (2) water system changes; (3) review of heating, ventilation, and air-conditioning replacement equipment and training to ensure automation systems programmable and properly programmed; (4) the review of minor motorized equipment subject to replacement to ensure replacement equipment has premium efficiency motors and (5) the following retrofits that require no significant expenditure of funds: (i) disconnection of drink vending machine lamps; (ii) use of power save features on office equipment; and (iii) purchase of Energy Star equipment and appliances.
- Section 2.1(b) requires the Department to develop or revise its architectural and engineering standards by February 1, 2008 to provide assistance in determining which energy conservation measures are best suited to the unique characteristics of each building.
- The Department must report to the Joint legislative Commission on Governmental Operations on its plan to implement this section no later than February 1, 2008.
- Section 2.1(d) provides that this section does not apply to the implementation of energy, water, or other utility conservation measures that conflict with respect to historic properties.

PART III. Requires the Department to conduct energy audits every five years for State, and university buildings and require annual updates of State and university plans to manage utility use.

- Section 3.1(a) amends G.S. 143-64.12, *Energy Conservation, Authority and duties of State agencies*, to require the Department to develop a comprehensive program to manage energy, water, and other utility use and update the program annually. Stated goals for all State buildings is to reduce energy use by 20% for all State buildings in total by 2010 and 30% by fiscal year 2015 compared to the 2003 baseline. This section also requires State agencies, and universities to implement and update annually a management plan that is consistent with the State's program under this section.
- The Department is also required to develop an energy audit and a procedure for conducting energy audits. Every five years, the Department must conduct an energy audit for each state agency or university facility. When conducting an energy audit, the Department shall identify and recommend any State or university facility as suitable for building commissioning to reduce energy consumption or suitable for the installation of an energy savings measure pursuant to a guaranteed energy savings contract.
- The Department is to establish an additional team as required by Section 3.2 to identify and recommend energy conservation maintenance and operating procedures, conduct energy audits, and identify facilities as suitable for energy reduction measures.

PART IV. Requires life-cycle cost analysis to be commenced and certified at the schematic design phase of construction or renovation projects and be updated, amended and recertified as needed at later phases.

- Sections 4.1 and 4.2 amend G.S. 143-64.15, *Energy Conservation, Life-cycle cost analysis*, and G.S. 143-64.15A, *Certification of life-cycle cost analysis*, to require a life-cycle cost analysis to commence at the schematic phase of each construction or renovation project and updated or amended at the design development phase and the construction document phase. The State agency, university or community college must submit the analysis to the Department for certification at the schematic phase and again as needed.

ASSUMPTIONS AND METHODOLOGY:

Section 1.1

This section addresses new energy conservation construction standards for State facilities and community colleges. For the purpose of this analysis, community college facilities are excluded since they are owned by the Boards of Trustees for those colleges. This analysis focuses on State-owned facilities, including the University of North Carolina.

New Construction

The bill requires that new State buildings reduce energy consumption by 30% beyond the ASHRAE standard 90.1-2004. The difficulty with projecting the impact of this legislation on future State construction is that the State does not consistently fund and build new facilities. For the purpose of this analysis, I will use the Governor's Six-Year Capital Improvements Plan (6-Year CIP) as the basis for future State construction.

Capital Budget Impacts

The State's 6-Year CIP recommends the following authorizations for new construction, excluding land conservation and water/sewer initiatives:

FY 2007-08 - \$214,358,863
FY 2008-09 - \$417,788,116
FY 2009-10 - \$420,943,508
FY 2010-11 - \$383,456,216
FY 2011-12 - \$336,924,945
FY 2012-13 - \$167,832,800

Assuming that the General Assembly authorizes and provides funding for the Governor's Plan, the estimated cost for construction would be increased by raising the standards for the mechanical systems in future State facilities. According to the State Construction Office, the fiscal impact to construction budgets by implementing the new standard in Section 1.1 of this bill would be an additional 2-3%.

Using an assumption of 2.5% impact to construction budgets, the recommended 6-Year CIP would be increased by the following amounts:

FY 2007-08 - \$5,358,972
FY 2008-09 - \$10,444,703
FY 2009-10 - \$10,523,588
FY 2010-11 - \$9,586,405
FY 2011-12 - \$8,423,124
FY 2012-13 - \$4,195,820
Total - \$48,532,611

Assuming the implementation of the State's 6-Year CIP, the bill is estimated to **increase construction costs by \$48.5 million on \$1.94 billion in construction.**

Operating Budget Impacts

Energy Consumption - According to the State Property Office's Facility Information System, the State currently owns 107,247,251 gross square feet of building space. According to the State Controller's Office, the State expended \$291,349,736 to power and heat State buildings in FY 2005-06. This results in a \$2.72 per square foot cost to provide energy to State facilities for a year. In the previous two fiscal years, this cost unit was \$2.36 per square foot.

According to inflation estimates from Economy.com, the State can expect this cost per unit figure for energy utilities and fuel to increase by the following:

Fiscal Year	Estimated Inflation	Electricity Costs / gross square foot
2006-07	3.31%	\$2.81
2007-08	1.45%	\$2.85
2008-09	1.09%	\$2.88
2009-10	1.19%	\$2.92
2010-11	2.02%	\$2.97
2011-12	2.53%	\$3.05
2012-13	2.87%	\$3.14
2013-14	2.98%	\$3.23
2014-15	3.02%	\$3.33
2015-16	3.03%	\$3.43
2016-17	3.03%	\$3.53

The bill assumes reducing energy consumption by 30% beyond the ASHRAE 90.1-2004 standard. To determine the impact of the bill on new State construction, this analysis assumes the following:

- Implementation of the State 6-Year CIP
- Exclusion of the land conservation and water/sewer proposals in the 6-Year CIP
- The 6-Year CIP will generate approximately 7.5 million new gross square feet to the State's building stock
- The average cost for one gross square foot of 6-Year CIP construction is \$258.84. This will be called the Gross Square Foot Cost Factor (GSF Cost Factor).
- Energy inflation estimates listed above.
- 36 months from capital authorization to beneficial occupancy

Fiscal Year	6-Year CIP	GSF Cost Factor	Estimated New GSF	Energy Cost/GSF	Energy Expenditures - Current Law	Energy Expenditures - 30% Reduction	Anticipated Operating Impact
2007-08	\$214,358,863	\$258.84	828,150	-	-	-	-
2008-09	\$417,788,116	\$258.84	2,442,225	-	-	-	-
2009-10	\$420,943,508	\$258.84	4,068,490	\$2.92	2,415,002	\$1,690,502	(\$724,501)
2010-11	\$383,456,216	\$258.84	5,549,928	\$2.97	7,265,545	\$5,085,881	(\$2,179,663)
2011-12	\$336,924,945	\$258.84	6,851,598	\$3.05	12,409,809	\$8,686,867	(\$3,722,943)
2012-13	\$167,832,800	\$258.84	7,500,000	\$3.14	17,414,760	\$12,190,332	(\$5,224,428)
2013-14	-	-	-	\$3.23	22,139,860	\$15,497,902	(\$6,641,958)

Fiscal Year	6-Year CIP	GSF Cost Factor	Estimated New GSF	Energy Cost/GSF	Energy Expenditures - Current Law	Energy Expenditures - 30% Reduction	Anticipated Operating Impact
2014-15	-	-	-	\$3.33	24,966,913	\$17,476,839	(\$7,490,074)
2015-16	-	-	-	\$3.43	25,722,975	\$18,006,083	(\$7,716,893)
2016-17	-	-	-	\$3.53	26,502,204	\$18,551,543	(\$7,950,661)
2017-18	-	-	-	\$3.64	27,304,453	\$19,113,117	(\$8,191,336)
2018-19	-	-	-	\$3.75	28,131,460	\$19,692,022	(\$8,439,438)
2019-20	-	-	-	\$3.86	28,983,928	\$20,288,750	(\$8,695,179)
2020-21	-	-	-	\$3.98	29,862,613	\$20,903,829	(\$8,958,784)
2021-22	-	-	-	\$4.10	30,768,290	\$21,537,803	(\$9,230,487)
2022-23	-	-	-	\$4.23	31,701,721	\$22,191,205	(\$9,510,516)
2023-24	-	-	-	\$4.36	32,663,686	\$22,864,580	(\$9,799,106)
2024-25	-	-	-	\$4.49	33,653,762	\$23,557,633	(\$10,096,128)
2025-26	-	-	-	\$4.62	34,673,848	\$24,271,694	(\$10,402,154)
2026-27	-	-	-	\$4.76	35,724,854	\$25,007,398	(\$10,717,456)
Total	\$1,941,304,448	-	-	-	\$452,305,684	\$316,613,979	(\$135,691,705)

Assuming the implementation of the State's 6-Year CIP, the bill is estimated to **reduce the growth in future energy expenditures by \$135.7 million over the next twenty years.**

Water Consumption – In FY 2005-06, the State expended \$35,866,708 on water and wastewater services. Based on current State building assets totaling 107,247,251 gross square feet, the cost for water/wastewater per gross square foot is \$0.33. The rate of inflation for water and wastewater services has been \$.02 per year for the previous four years. Assuming \$.02 increases for the next 5 years and \$0.01 increase for the following years, water/wastewater per gross square foot can be expected to increase as follows:

Fiscal Year	Estimated Inflation	Water/Wastewater Costs per gross square foot
2006-07	\$0.02	\$0.35
2007-08	\$0.02	\$0.37
2008-09	\$0.02	\$0.39
2009-10	\$0.02	\$0.41
2010-11	\$0.02	\$0.43
2011-12	\$0.01	\$0.44
2012-13	\$0.01	\$0.45
2013-14	\$0.01	\$0.46
2014-15	\$0.01	\$0.47
2015-16	\$0.01	\$0.48
2016-17	\$0.01	\$0.49

The bill assumes reducing potable water consumption by 20% and outdoor potable water by 50% beyond the baseline established from meeting the fixture requirements of the 2006 North Carolina Plumbing Code. To determine the impact of the bill on new State construction, this analysis uses the same assumptions listed for the energy consumption analysis, except that this analysis assumes:

- Water inflation estimates in the chart on page 5
- Cost savings to both water and wastewater, since the expenditures for each utility are not separated in the State's accounting system. There should be a correlation between the reduction in water consumption and the reduction in wastewater creation
- 20% reduction to all water usage, since outdoor water usage cannot be separated. The analysis conservatively assumes that more indoor water is consumed than outdoor water

Fiscal Year	6-Year CIP	GSF Cost Factor	Estimated New GSF	Water-Wastewater Cost/GSF	Water-Wastewater Expenditures – Current Law	Water-Wastewater Expenditures – 20% Reduction	Anticipated Operating Impact
2007-08	\$214,358,863	\$258.84	828,150	-	-	-	-
2008-09	\$417,788,116	\$258.84	2,442,225	-	-	-	-
2009-10	\$420,943,508	\$258.84	4,068,490	\$0.41	339,542	\$271,633	(\$67,908)
2010-11	\$383,456,216	\$258.84	5,549,928	\$0.43	1,050,157	\$840,125	(\$210,031)
2011-12	\$336,924,945	\$258.84	6,851,598	\$0.44	1,790,136	\$1,432,109	(\$358,027)
2012-13	\$167,832,800	\$258.84	7,500,000	\$0.45	2,497,468	\$1,997,974	(\$499,494)
2013-14	-	-	-	\$0.46	3,151,735	\$2,521,388	(\$630,347)
2014-15	-	-	-	\$0.47	3,525,000	\$2,820,000	(\$705,000)
2015-16	-	-	-	\$0.48	3,600,000	\$2,880,000	(\$720,000)
2016-17	-	-	-	\$0.49	3,675,000	\$2,940,000	(\$735,000)
2017-18	-	-	-	\$0.50	3,750,000	\$3,000,000	(\$750,000)
2018-19	-	-	-	\$0.51	3,825,000	\$3,060,000	(\$765,000)
2019-20	-	-	-	\$0.52	3,900,000	\$3,120,000	(\$780,000)
2020-21	-	-	-	\$0.53	3,975,000	\$3,180,000	(\$795,000)
2021-22	-	-	-	\$0.54	4,050,000	\$3,240,000	(\$810,000)
2022-23	-	-	-	\$0.55	4,125,000	\$3,300,000	(\$825,000)
2023-24	-	-	-	\$0.56	4,200,000	\$3,360,000	(\$840,000)
2024-25	-	-	-	\$0.57	4,275,000	\$3,420,000	(\$855,000)
2025-26	-	-	-	\$0.58	4,350,000	\$3,480,000	(\$870,000)
2026-27	-	-	-	\$0.59	4,425,000	\$3,540,000	(\$885,000)
Total	\$1,941,304,448	-	-	-	\$60,504,037	\$48,403,229	(\$12,100,807)

Assuming the implementation of the State's 6-Year CIP, the bill is estimated to **reduce the growth in future water and wastewater expenditures by \$12.1 million over the next 20 years.**

Renovation of Existing Facilities

Determining the fiscal impact of the bill to the renovation of existing buildings is more imprecise than analyzing the impact on new construction. There are a number of factors that make assessing an impact difficult including:

- Historically inconsistent funding of repairs and renovations
- Not enough information to determine at this time which renovation projects would be affected by the bill
- With new construction, the facility can be designed to meet the new standards. Changing an existing building to meet new standards can result and significant construction challenges and costs
- Less certainty with meeting energy and water reduction targets

In order to demonstrate the potential impact of the bill on existing buildings, a scenario was developed based on the State's 6-Year CIP for Repairs and Renovations. This scenario assumes the following:

- As presented in the State's 6-Year CIP, the General Assembly will appropriate \$100 million in repairs and renovation projects in each of the next six years
- \$46 million will be allocated annually to the University of North Carolina
- \$54 million will be allocated annually to the remaining State agencies
- 50% of repair and renovation appropriations will be for projects covered by the bill. *Without a schedule of eligible projects, this assumption is somewhat arbitrary.*
- \$107 per gross square foot to renovate general State facilities. As reported in *R.S. Means Repair and Remodeling Cost Data 2007*, the cost to renovate a mid-size office building is \$107 per gross square foot.
- \$144 per gross square foot to renovation University facilities. As reported in *R.S. Means Repair and Remodeling Cost Data 2007*, the cost to renovate a college classroom building is \$144 per gross square foot.

Capital Budget Impact

For the purpose of this analysis, the elevated construction standards required by the bill are assumed to increase the construction budgets by 2.5%. This is the same capital cost impact assumption used for new construction. Assuming the implementation of the State's 6-Year CIP, the resulting **impact would be a construction cost increase of \$2.3 million each year or \$13.8 million over six years.**

Operating Budget Impact

Energy Consumption – According to the assumptions set out for the renovation of existing buildings scenario and the assumptions for the anticipated energy costs for new construction on page 4, the impact of the bill on the renovation of existing facilities and energy consumption is as follows:

Fiscal Year	50% of R&R Projects for State Agencies	50% of R&R Projects for UNC	Cost per GSF - State Agency Renovations	Cost per GSF - UNC Renovations	Renovated Square Feet - All Agencies
2007-08	\$27,000,000	\$23,000,000	\$107.00	\$144.00	412,059
2008-09	\$27,000,000	\$23,000,000	\$107.00	\$144.00	824,117

Fiscal Year	50% of R&R Projects for State Agencies	50% of R&R Projects for UNC	Cost per GSF - State Agency Renovations	Cost per GSF - UNC Renovations	Renovated Square Feet - All Agencies
2009-10	\$27,000,000	\$23,000,000	\$107.00	\$144.00	1,236,176
2010-11	\$27,000,000	\$23,000,000	\$107.00	\$144.00	1,648,235
2011-12	\$27,000,000	\$23,000,000	\$107.00	\$144.00	2,060,293
2012-13	\$27,000,000	\$23,000,000	\$107.00	\$144.00	2,472,352
Total	\$162,000,000	\$138,000,000	-	-	2,472,352

Fiscal Year	Renovated Square Feet - All Agencies	Energy Cost/GSF	Energy Expenditures - Current Law	Energy Expenditures - 30% Reduction	Anticipated Operating Impact
2007-08	412,059	-	-	-	-
2008-09	824,117	-	-	-	-
2009-10	1,236,176	\$2.92	1,201,621	\$841,135	(\$360,486)
2010-11	1,648,235	\$2.97	2,451,724	\$1,716,207	(\$735,517)
2011-12	2,060,293	\$3.05	3,770,614	\$2,639,430	(\$1,131,184)
2012-13	2,472,352	\$3.14	5,171,889	\$3,620,322	(\$1,551,567)
2013-14	-	\$3.23	6,657,514	\$4,660,260	(\$1,997,254)
2014-15	-	\$3.33	8,230,266	\$5,761,186	(\$2,469,080)
2015-16	-	\$3.43	8,479,500	\$5,935,650	(\$2,543,850)
2016-17	-	\$3.53	8,736,370	\$6,115,459	(\$2,620,911)
2017-18	-	\$3.64	9,000,829	\$6,300,580	(\$2,700,249)
2018-19	-	\$3.75	9,273,450	\$6,491,415	(\$2,782,035)
2019-20	-	\$3.86	9,554,463	\$6,688,124	(\$2,866,339)
2020-21	-	\$3.98	9,844,119	\$6,890,883	(\$2,953,236)
2021-22	-	\$4.10	10,142,673	\$7,099,871	(\$3,042,802)
2022-23	-	\$4.23	10,450,375	\$7,315,263	(\$3,135,113)
2023-24	-	\$4.36	10,767,484	\$7,537,239	(\$3,230,245)
2024-25	-	\$4.49	11,093,859	\$7,765,702	(\$3,328,158)
2025-26	-	\$4.62	11,430,128	\$8,001,089	(\$3,429,038)
2026-27	-	\$4.76	11,776,589	\$8,243,612	(\$3,532,977)
Total	2,472,352	-	\$148,033,467	\$103,623,427	(\$44,410,040)

Assuming the implementation of the scenario for the renovation of existing buildings described above, the bill is estimated to **reduce energy expenditures by \$44.4 million over the next 20 years.**

Water Consumption - According to the assumptions set out for the renovation of existing buildings scenario and the assumptions for the anticipated water and wastewater costs for new construction on pages 5 and 6, the impact of the bill on the renovation of existing facilities and water consumption is as follows:

Fiscal Year	Renovated Square Feet - All Agencies	Water-Wastewater Cost/GSF	Water-Wastewater Expenditures - Current Law	Water-Wastewater Expenditures - 20% Reduction	Anticipated Operating Impact
2007-08	412,059	-	-	-	-
2008-09	824,117	-	-	-	-
2009-10	1,236,176	\$0.41	168,944	\$135,155	(\$33,789)
2010-11	1,648,235	\$0.43	354,370	\$283,496	(\$70,874)
2011-12	2,060,293	\$0.44	543,917	\$435,134	(\$108,783)
2012-13	2,472,352	\$0.45	741,706	\$593,364	(\$148,341)
2013-14	-	\$0.46	947,735	\$758,188	(\$189,547)
2014-15	-	\$0.47	1,162,005	\$929,604	(\$232,401)
2015-16	-	\$0.48	1,186,729	\$949,383	(\$237,346)
2016-17	-	\$0.49	1,211,452	\$969,162	(\$242,290)
2017-18	-	\$0.50	1,236,176	\$988,941	(\$247,235)
2018-19	-	\$0.51	1,260,900	\$1,008,720	(\$252,180)
2019-20	-	\$0.52	1,285,623	\$1,028,498	(\$257,125)
2020-21	-	\$0.53	1,310,347	\$1,048,277	(\$262,069)
2021-22	-	\$0.54	1,335,070	\$1,068,056	(\$267,014)
2022-23	-	\$0.55	1,359,794	\$1,087,835	(\$271,959)
2023-24	-	\$0.56	1,384,517	\$1,107,614	(\$276,903)
2024-25	-	\$0.57	1,409,241	\$1,127,393	(\$281,848)
2025-26	-	\$0.58	1,433,964	\$1,147,171	(\$286,793)
2026-27	-	\$0.59	1,458,688	\$1,166,950	(\$291,738)
Total	2,472,352	-	\$19,791,178	\$15,832,942	(\$3,958,236)

Assuming the implementation of the scenario for the renovation of existing buildings described above, the bill is estimated to **reduce water and wastewater expenditures by \$3.9 million over the next 20 years.**

Section 1.2

No anticipated fiscal impact.

Section 1.3

No anticipated fiscal impact

Section 1.4

No anticipated fiscal impact

Section 1.5

By requiring that State property acquisitions to meet the energy and water standards of Section 1.1 of the bill, the market price for property acquisitions should increase. Neither the marginal increase in price nor the number of anticipated covered property acquisitions can be determined at this time. As a result, no fiscal impact analysis was performed.

Section 2.1

Part II of the bill specifies the retrofitting of State buildings to reduce energy and water consumption. According to the State Energy Office, following consumption reductions could be achieved through implementing part II of the bill:

- By replacing all necessary exit signs with Light Emitting Diode (LED) signs, the State would save \$19.44 annually per sign. LED signs last 10-15 years. Assuming a 12 year life, the State would save \$271 per sign over the life of the sign.
- By replacing all incandescent light bulbs with compact fluorescent light bulbs, the State would reduce the cost of powering light bulbs by 70-75%.
- By installing low flow sink aerators, the State could reduce the flow of water by 2-4.5 gallons per minute for each sink.
- By installing low flow shower heads, the State could reduce the flow of water by 4.5 gallons per minute for each shower head.
- By properly maintaining and programming HVAC systems, the State would reduce energy expenditures on inefficient HVAC systems. The State Energy Office estimates that with a typical \$2,000 investment for tuning-up an HVAC system, the State would achieve an average 2 to 4 month payback. In other words, a single \$2,000 tune-up could be repaid with energy savings within 3 months and generate \$8,000 in annual utilities savings.

Fiscal Impact of Part II

As this time, neither the State Energy Office nor the State Construction Office has sufficient information to determine the number of exit signs, light bulbs, sinks, showers, and HVAC systems that would be affected by Part II. The implementation of part II is expected to result in operating budget cost reduction through reduced energy and water consumption, but the total anticipated cost reduction cannot be determined at this time.

Section 3.1

Part III of the bill requires the Department of Administration to perform energy audits and commissioning of State buildings. In addition to revising G.S. 143-64.12 to require certain energy planning efforts by State agencies, part III directs the Facility Condition and Assessment Program (FCAP) in the State Construction Office to perform energy audits as part of FCAP activities. Part III also directs the State Construction Office, through FCAP, to identify suitable buildings for commissioning.

Section 3.2

Compels the Department of Administration to establish a new 3 position FCAP Team to address energy audits and identify suitable commissioning projects. These positions will cost \$265,787 in FY 2007-08 for 3 Building System Engineer II positions and \$252,287 recurring in future years to support these positions to be located in the State Construction Office.

Fiscal Impacts of Part III

A fiscal impact analysis was not performed on building commissioning activities supported in Part III. Without reliable information as to the amount of building commission that would occur from the enactment of this part, a fiscal impact cannot be determined.

According to the State Energy Office, the average cost for commissioning existing buildings is \$0.27 per square foot. According to the State Construction Office, the payback period for commissioning activities is about 20 months.

Sections 4.1 and 4.2

Part IV of the bill revises G.S. 143-64.15 and G.S. 143-64.15A to require the use of life cycle cost analyses earlier in the design of State and community college facilities. According to conversations with the State Construction Office and the State Energy Office, the State could mitigate substantial construction cost increases by considering more energy and water efficient options earlier in the design process. Often, the life cycle cost analysis is performed at a point in the design process when changes to the design prove costly or undesirable for the agencies owning the project. The State Construction Office will need one Building System Engineer III position in its Design Review Section to conduct the life-cycle cost analyses. This position will cost \$100,000 in FY 2007-08 and \$95,050 annually thereafter to support this function.

Fiscal Impacts of Part IV

A fiscal impact analysis was not performed on the anticipated savings from implementing part IV. Without reliable information regarding: (i) the anticipated increase to construction budgets to implement superior life cycle cost analysis options, and (ii) the anticipated operating budget savings, the fiscal impact could not be determined.

Summary Chart - Senate Bill 668							
	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	20-Year Total
Part I							
New Construction							
Cost Increases	\$5,358,972	\$10,444,703	\$10,523,588	\$9,586,405	\$8,423,124	\$4,195,820	\$48,532,611
Renovation							
Cost Increases	\$2,300,000	\$2,300,000	\$2,300,000	\$2,300,000	\$2,300,000	\$2,300,000	\$13,800,000
Operating Cost Savings for New Construction			(\$792,409)	(\$2,389,695)	(\$4,080,970)	(\$5,723,921)	(\$147,792,512)
Operating Cost Savings for Renovations			(\$394,275)	(\$806,391)	(\$1,239,968)	(\$1,699,908)	(\$48,368,276)
Part II							
Operating Cost Savings from Retrofits	Fiscal Impact not Determined						
Part III							
Building Commissioning	Fiscal Impact not Determined						\$5,000,000
Part IV							
Operating Cost Savings from LCCA Revisions	Fiscal Impact not Determined						

SOURCES OF DATA: Department of Administration; R.S. Means Construction Publishers and Consultants.

TECHNICAL CONSIDERATIONS: None

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