

**GENERAL ASSEMBLY OF NORTH CAROLINA**  
**SESSION 2007**

**SESSION LAW 2007-546**  
**SENATE BILL 668**

**AN ACT TO PROMOTE THE CONSERVATION OF ENERGY AND WATER USE IN STATE, UNIVERSITY, AND COMMUNITY COLLEGE BUILDINGS.**

The General Assembly of North Carolina enacts:

**SECTION 1.(a)** Findings and Legislative Intent. – The General Assembly finds that public buildings can be built and renovated using sustainable, energy efficient methods that save money, reduce negative environmental impacts, improve employee and student performance, and make employees and students more productive. The main objectives of sustainable, energy efficient design are to avoid resource depletion of energy, water, and raw materials; prevent environmental degradation caused by facilities and infrastructure throughout their life cycle; and create buildings that are livable, comfortable, safe, and productive. It is the intent of the General Assembly that State-owned buildings, The University of North Carolina, and the North Carolina Community College System be improved by establishing specific performance criteria and goals for sustainable, energy efficient public buildings based upon recognized, consensus standards with scientifically proven basis and demonstrated performance. The General Assembly also intends that State agencies, The University of North Carolina, and the North Carolina Community College System shall perform after-construction measurement and verification of costs and savings to confirm that the performance goals of this section are met and ensure that economic and environmental goals are achieved. Also, it is the intent of the General Assembly to establish a priority to use North Carolina-based resources, building materials, products, industries, manufacturers, and businesses to provide economic development to North Carolina and to meet the objectives of this section.

**SECTION 1.(b)** Definitions. – As used in this section, the following definitions apply:

- (1) "ASHRAE" means the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
- (2) "Department" means the Department of Administration.
- (3) "Institutions of higher education" means the constituent institutions of The University of North Carolina, the regional institutions as defined in G.S. 115D-2, and the community colleges as defined in G.S. 115D-2.
- (4) "Major facility" means a construction project larger than 20,000 gross square feet of occupied or conditioned space, as defined in the North Carolina State Building Code, or a building renovation project when the cost is greater than fifty percent (50%) of the insurance value and the project is larger than 20,000 gross square feet of occupied or conditioned space, as defined in the North Carolina State Building Code, whose construction is funded in whole or in part by the State of North Carolina. "Major facility" does not include the following: transmitter buildings or pumping stations.
- (5) "Public agency" means every State office, officer, board, department, and commission and institutions of higher education.
- (6) "Sustainable, energy efficient public buildings" means public buildings that, by complying with this section, are the most economical energy and water efficiency for that building type.

**SECTION 1.(c)** Standard for Major Facilities; Reports by Agencies and the Department. – The Sustainable Energy Efficient Buildings Program is established in the Department. Under this program:

- (1) All major facility projects of public agencies shall be designed, constructed, and certified to at least a thirty percent (30%) greater energy efficiency than the standard under ASHRAE 90.1-2004. For major renovations a twenty percent (20%) greater energy efficiency standard than ASHRAE 90.1-2004 shall be used. In addition, for new construction, the water systems shall be designed and constructed to use a minimum of twenty percent (20%) less potable water than the indoor water use baseline calculated for the building after meeting the fixture performance requirements required by the 2006 North Carolina Plumbing Code. Outdoor potable water or harvested groundwater consumption shall be reduced by a minimum of fifty

percent (50%) over that consumed by conventional means through water use efficient landscape materials and irrigation strategies, including water reuse and recycling. This section applies to major facility projects that have not entered the schematic design phase prior to the effective date of this section.

- (2) For the purposes of this section, any exceptions or special standards for specific types of buildings or building facilities found in ASHRAE 90.1-2004 are included in the ASHRAE 90.1-2004 standard under subdivision (1) of this subsection.
- (3) Commissioning for Major Facilities. – Building and/or system commissioning practices, tailored to the size and complexity of the building and its system components, shall be employed in order to verify performance of building components and systems and help ensure that design requirements are met upon completion of construction.
- (4) Measurement and Verification for Major Facilities.
  - a. Building level owner's meters for electricity, natural gas, fuel oil, and water in accordance with United States Department of Energy (DOE) guidelines issued under Section 103 of the Energy Policy Act of 2005 shall be installed. The public agency and the designers shall compare metered data from the first 12 months of building operation with the energy design target(s) and report that performance to the State Construction Office.
  - b. If the average building energy or water consumption over the one-year period following the date of beneficial occupancy is eighty-five percent (85%) or less than the performance goals established by these standards, the designer, owner agency, contractor, Contract Manager at Risk, and commissioning agent shall investigate, determine the cause of the shortfall, and recommend corrections or modifications to meet performance goals.
- (5) The Department shall consolidate the reports required in this subsection and any report from the State Building Commission under G.S. 143-135.39 into one report and report to the Chairs of the General Government Appropriations Subcommittees of both the Senate and the House of Representatives, the Environmental Review Commission, and the Joint Legislative Commission on Governmental Operations by November 1 of each year beginning in 2008. In its report, the Department shall also report on the implementation of this section including reasons why the standards required in subdivision (1) of this subsection were not used for the reason that it would not be practicable in accordance with G.S. 143-135.39. The Department shall make recommendations regarding the ongoing implementation of this section, including a discussion of incentives and disincentives related to implementing this section.

**SECTION 1.(d) Guidelines for Administering the Sustainable Energy Efficient Buildings Program. –**

- (1) The Department, in consultation with affected public agencies, shall develop and issue policies and technical guidelines to implement this section for public agencies. The purpose of these policies and guidelines is to define procedures and methods for complying with the criteria and performance goals for major facility projects defined by G.S. 143-135.37.
- (2) As provided in the request for proposals for construction services, the public agency may hold a preproposal conference for prospective bidders to discuss compliance with, and achievement of, standards identified in this section for prospective respondents.
- (3) The Department shall create a sustainable, energy efficient buildings advisory committee comprised of representatives from the design and construction industry involved in public works contracting, personnel from the affected public agencies responsible for overseeing public works projects, and others at the Department's discretion to provide advice on implementing this section. Among other duties, the advisory committee shall make recommendations regarding an education and training process for stakeholders and an ongoing evaluation or feedback process to help the Department implement this section. The advisory committee may also make recommendations to the Department regarding water efficiency requirements and energy efficiency requirements.
- (4) The Department shall review the advisory committee's recommendations under subdivision (3) of this subsection regarding education and training. The Department shall develop one level of education and training requirements for the chief financial officer of each public agency that is appropriate for the chief financial officer's level of involvement in projects under this section. The Department shall develop, for each public agency that is responsible for the payment of the agency's utilities, another higher level of education and training requirements for the facility manager of the agency that is appropriate for the facility manager's level of involvement in projects under this section. This level of education and training shall also be a requirement for the capital project coordinator of an agency involved in a project under this

section. The Department shall develop a highest level of education and training requirements for the architects and mechanical design engineers that are involved in the design of projects under this section that is appropriate for their level of involvement in these projects.

- (5) The Department may adopt rules to implement this section. The Department may adopt architectural or engineering standards as needed to implement this section.

**SECTION 1.(e)** Use of Other Standard when ASHRAE Standard Not Practicable. – When the Department, public agency, and the design team determine the ASHRAE 90.1-2004 standard to be not practicable for a major facility project, then it must be determined by the State Building Commission if the standard is not practicable for that major facility project. If the State Building Commission determines the standard is not practicable for that major facility project, the State Building Commission shall determine which standard is practicable for the design and construction for that major facility project. If the ASHRAE 90.1-2004 standard is not followed for that project, the public agency shall report this information and the reasons to the Department in its report under G.S. 143-135.37, and the State Building Commission shall report this information and the reasons to the Department.

**SECTION 1.(f)** Monitor Development of Construction and Energy Efficiency Standards. – The Department shall monitor the development of construction or other energy efficiency standards to determine whether there is a standard that the Department determines would better fulfill the intent of the Sustainable Energy Efficient Buildings Program to achieve energy efficiency and increased energy savings in major facility projects in buildings of the State, The University of North Carolina, and the North Carolina Community College System than the ASHRAE 90.1-2004 standard and, if so, whether this section should be amended to provide for the use of this standard rather than the ASHRAE 90.1-2004 standard. Specifically, the Department shall monitor the development of improved energy efficiency standards developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, the ASHRAE standards, and monitor whether the State Building Code Council adopts improved ASHRAE standards or any other energy efficiency standards for inclusion in the State Building Code that result in greater energy efficiency and increased energy savings in major facility projects in State, university system, and community college buildings. No later than January 1, 2009, and again January 1, 2010, the Department shall report to the Chairs of the General Government Appropriations Subcommittees of both the Senate and the House of Representatives, the Environmental Review Commission, and the Joint Legislative Commission on Governmental Operations on the results of its monitoring under this subsection, including any recommendations for administrative or legislative proposals.

**SECTION 1.(g)** Performance Review. – The Department shall conduct a performance review of the Sustainable Energy Efficient Buildings Program. The performance review shall include at least all of the following:

- (1) Identification of the costs of implementing energy and water efficient building standards in the design and construction of major facility projects subject to this act.
- (2) Identification of operating savings attributable to the implementation of energy and water efficient building standards, including, but not limited to, savings in energy, water, utility, and maintenance costs.
- (3) Identification of any impacts on employee productivity from using energy and water efficient building standards.
- (4) Evaluation of the effectiveness of the energy and water efficient building standards established by this act.
- (5) Any recommendations for any changes in those standards that may be supported by the Department's findings.

**SECTION 1.(h)** Report on Performance Review. – No later than December 1, 2010, the Department shall make a preliminary report of its findings under its performance review under subsection (g) of this section and its recommendations and, on or before December 1, 2011, a final report to the Chairs of the General Government Appropriations Subcommittees of both the Senate and the House of Representatives, the Environmental Review Commission, and the Joint Legislative Commission on Governmental Operations.

**SECTION 1.(i)** Purchase of Buildings Constructed or Renovated to Certain Energy and Water Efficiency Standards. –

- (1) A State agency shall not acquire by purchase any building unless the building was designed and constructed to at least the same standard for energy and water efficiency that the design and construction of a comparable building was required to meet under applicable State law or local ordinance at the time the building under consideration for purchase was constructed.
- (2) A State agency shall not acquire by purchase any building that had a major renovation unless the renovation was performed to at least the same standard for energy and water efficiency that the design and construction of a major renovation of a comparable building was required to meet under applicable State law or local ordinance at the time the building under consideration for purchase was renovated.

- (3) This subsection does not apply to the purchase of a building having historic, architectural, or cultural significance under G.S. 143-23.1. This subsection does not apply to buildings that are acquired by devise or bequest.

**SECTION 2.1.(a)** The Department of Administration shall administer and oversee the implementation of a program whereby all of the following energy conservation measures, as defined in G.S. 143-64.17, shall be fully implemented no later than December 31, 2009, in each building owned by the State, The University of North Carolina, or the North Carolina Community College System:

- (1) **Lighting Systems.** – The installation of exit signs that employ light-emitting diode (LED) technology; the replacement of incandescent light bulbs with compact fluorescent light bulbs; and where appropriate, as determined by the Department of Administration, the installation of occupancy sensors or optical sensors.
- (2) **Water Systems.** – The installation of aerators in sink faucets that reduce the flow of water to a rate of no more than five-tenths gallons per minute (0.5 g.p.m.); the installation of shower heads that reduce the flow of water to a rate of no more than one and five-tenths gallons per minute (1.5 g.p.m.); where appropriate, as determined by the Department of Administration, the resetting of hot water heaters to a water temperature of 120 degrees; the training of staff to monitor the use of irrigation systems and to base the use of the system on the moisture content of the soil, and either the elimination of potable water for irrigation or the reduction of water consumption in the building by twenty percent (20%) based on water consumption for the 2002-2003 fiscal year.
- (3) **Heating, Ventilation, and Air-Conditioning (HVAC) Systems.** – For HVAC equipment that is subject to replacement, the review of the specifications for the replacement HVAC equipment to ensure that it is not oversized; and, for building automation systems that are programmable, the training to ensure that these systems are properly programmed.
- (4) **Minor Equipment.** – For minor motorized equipment that is subject to replacement, the replacement of minor equipment with equipment that has premium efficiency motors. For purposes of this subdivision, 'premium efficiency motor' means a motor that meets or exceeds a set of minimum full-load efficiency standards developed by the National Electrical Manufacturers Association (NEMA).
- (5) **Other Energy Conservation Measures.** – Disconnect lamps in drink vending machines; use power save feature on computers, monitors, copiers, fax machines, and other office equipment; and when purchasing office equipment or appliances, purchase only Energy Star office equipment and appliances.

**SECTION 2.1.(b)** Consistent with G.S. 150B-2(8a)h., the Department of Administration shall develop or revise its architectural and engineering standards to provide assistance in determining which energy conservation measures are best suited to the unique characteristics of each building and in determining the specifications for the energy conservation measures under this section. The development or revision of the architectural and engineering standards shall be completed by February 1, 2008.

**SECTION 2.1.(c)** Prior to implementing this section and no later than February 1, 2008, the Department of Administration shall report to the Joint Legislative Commission on Governmental Operations and the Environmental Review Commission on its plan to implement this section.

**SECTION 2.1.(d)** In order to protect the integrity of historic buildings, this section does not apply to the extent it would require the implementation of measures to conserve energy, water, or other utility use that conflict with respect to any property eligible for, nominated to, or entered on the National Register of Historic Places, pursuant to the National Historic Preservation Act of 1966, P.L. 89-665; any historic building located within an historic district as provided in Chapter 160A or 153A of the General Statutes; any historic building listed, owned, or under the jurisdiction of an historic properties commission as provided in Chapter 160A or 153A; or any historic property owned by the State or assisted by the State.

**SECTION 3.1.(a)** G.S. 143-64.12 reads as rewritten:

**"§ 143-64.12. Authority and duties of ~~State agencies~~ the Department; State agencies and State institutions of higher learning.**

(a) The Department of Administration through the State Energy Office shall develop a comprehensive program to manage energy, water, and other utility use for State agencies and State institutions of higher learning and shall update this program annually. Each State agency and State institution of higher learning shall develop and implement a management plan that is consistent with the State's comprehensive program under this subsection to manage energy, water, and other utility use. The energy consumption per gross square foot for all State buildings in total shall be reduced by twenty percent (20%) by 2010 and thirty percent (30%) by 2015 based on energy consumption for the 2003-2004 fiscal year. Each State agency and State institution of higher learning shall update its management plan annually and include strategies for supporting the energy consumption reduction requirements under this subsection. Each community college shall submit to the State

Energy Office an annual written report of utility consumption and costs.

~~(a1) The General Assembly authorizes and directs that State agencies and State institutions of higher learning shall carry out the construction and renovation of State facilities, under their jurisdiction facilities in such a manner as to further the policy declared herein, ensuring set forth under this section and to ensure the use of life-cycle cost analyses and practices to conserve energy, water, and other utilities.~~

(b) The Department of Administration shall develop and implement policies, procedures, and standards to ensure that State purchasing practices improve efficiency regarding energy, water, and other utility use and take the cost of the product over the economic life of the product into consideration. The Department of Administration shall adopt and implement Building Energy Design Guidelines. These guidelines shall include energy-use goals and standards, economic assumptions for life-cycle cost analysis, and other criteria on building systems and technologies. The Department of Administration shall modify the design criteria for construction and renovation of facilities of State buildings and State institutions of higher learning buildings to require that a life-cycle cost analysis be conducted pursuant to G.S. 143-64.15.

~~(b1) The Department of Administration, as part of the Facilities Condition and Assessment Program, shall identify and recommend energy conservation maintenance and operating procedures that are designed to reduce energy consumption within the facility of a State agency or a State institution of higher learning and that require no significant expenditure of funds. State departments, institutions, or agencies Every State agency or State institution of higher learning shall implement these recommendations. Where energy management equipment is proposed for State facilities, any facility of a State agency or of a State institution of higher learning, the maximum interchangeability and compatibility of equipment components shall be required. As part of the Facilities Condition and Assessment Program under this section, the Department of Administration shall develop an energy audit and a procedure for conducting energy audits. Every five years the Department shall conduct an energy audit for each State agency or State institution of higher learning.~~

~~The Department of Administration shall develop a comprehensive program to manage energy, water, and other utility use for State government. Each State agency shall develop and implement a management plan that is consistent with the State's comprehensive program to manage energy, water, and other utility use.~~

~~(c) through (g) Repealed by Session Laws 1993, c. 334, s. 4.~~

~~(h) When conducting an energy audit under this section, the Department of Administration shall identify and recommend any facility of a State agency or State institution of higher learning as suitable for building and commissioning to reduce energy consumption within the facility or as suitable for installing an energy savings measure pursuant to a guaranteed energy savings contract under Part 2 of this Article.~~

~~(i) Consistent with G.S. 150B-2(8a)h., the Department of Administration may adopt architectural and engineering standards to implement this section."~~

**SECTION 3.1.(b)** G.S. 143-64.10 reads as rewritten:

**"§ 143-64.10. Findings; policy.**

(a) The General Assembly finds all of the following:

- (1) That the State shall take a leadership role in aggressively undertaking the conservation of energy, water, and other utilities in North Carolina.
- (2) That State facilities and facilities of State institutions of higher learning have a significant impact on the State's consumption of energy, water, and other utilities.
- (3) That practices to conserve energy, water, and other utilities that are adopted for the design, construction, operation, maintenance, and renovation of these facilities and for the purchase, operation, and maintenance of equipment for these facilities will have a beneficial effect on the State's overall supply of energy, water, and other utilities.
- (4) That the cost of the energy, water, and other utilities consumed by these facilities and the equipment for these facilities over the life of the facilities shall be considered, in addition to the initial cost.
- (5) That the cost of energy, water, and other utilities is significant and facility designs shall take into consideration the total life-cycle cost, including the initial construction cost, and the cost, over the economic life of the facility, of the energy, water, and other utilities consumed, and of operation and maintenance of the facility as it affects the consumption of energy, water, or other utilities.
- (6) That State government shall undertake a program to reduce the use of energy, water, and other utilities in State facilities and facilities of the State institutions of higher learning and equipment in those facilities in order to provide its citizens with an example of energy-use, water-use, and utility-use efficiency.

(b) It is the policy of the State of North Carolina to ensure that practices to conserve energy, water, and other utilities are employed in the design, construction, operation, maintenance, and renovation of State facilities and facilities of the State institutions of higher learning and in the purchase, operation, and maintenance of equipment for ~~State these~~ facilities."

**SECTION 3.1.(c)** G.S. 143-64.11 is amended by adding a new subdivision to read:

"(10) 'State institution of higher learning' means any constituent institution of The University of North Carolina."

**SECTION 3.2.** The Department of Administration shall establish and train an additional team to examine existing facilities of State agencies and State institutions of higher learning to identify and recommend energy conservation maintenance and operating procedures designed to reduce energy consumption and to conduct energy audits and identify a facility as suitable for building commissioning or for installing an energy savings measure under the Facilities Condition Assessment Program (FCAP) under G.S. 143-64.12, as amended by Section 3.1 of this act.

**SECTION 4.1.** G.S. 143-64.15(a) reads as rewritten:

"(a) A life-cycle cost analysis shall be commenced at the schematic design phase of the construction or renovation project, shall be updated or amended as needed at the design development phase, and shall be updated or amended again as needed at the construction document phase. A life-cycle cost analysis shall include, but not be limited to, all of the following elements:

- (1) The coordination, orientation, and positioning of the facility on its physical ~~site;~~site.
- (2) The amount and type of fenestration and the potential for daylighting employed in the ~~facility;~~facility.
- (3) Thermal characteristics of materials and the amount of insulation incorporated into the facility ~~design;~~design.
- (4) The variable occupancy and operating conditions of the facility, including illumination ~~levels;~~and levels.
- (5) Architectural features that affect the consumption of energy, water, and other utilities."

**SECTION 4.2.** G.S. 143-64.15A reads as rewritten:

**"§ 143-64.15A. Certification of life-cycle cost analysis.**

~~All State agencies under the jurisdiction of the Department of Administration~~Each State agency and each State institution of higher learning performing a life-cycle cost analysis for the purpose of constructing or renovating any ~~State facility~~ shall, prior to selecting a design option or advertising for bids for construction, submit the life-cycle cost analysis to the Department for ~~certification.~~certification at the schematic design phase and again when it is updated or amended as needed in accordance with G.S. 143-64.15. The Department shall review the material submitted by the State ~~agency,~~agency or State institution of higher learning, reserve the right to require ~~agencies an agency or institution~~ to complete additional analysis to comply with certification, perform any additional analysis, as necessary, to comply with G.S. 143-341(11), and require that all construction or renovation conducted by the State agency or State institution of higher learning comply with the certification issued by the Department."

**SECTION 5.** This act shall not be construed to obligate the General Assembly to appropriate funds to implement the provisions of this act. Every public agency, as defined in subsection (c) of Section 1 of this act, to which this act applies may implement the provisions of this act from funds otherwise appropriated or available to that public agency.

**SECTION 6.** Section 1 of this act becomes effective 1 October 2008 and expires 1 October 2010. All other sections of this act become effective when this act becomes law. Section 1 of this act applies to contracts for the design of major facility projects, as defined in subsection (c) of Section 1 of this act, that are entered into on or after 1 October 2008. Section 4.1 of this act applies to life-cycle cost analyses commenced, and to contracts entered into for life-cycle cost analyses, on or after 1 December 2007.

In the General Assembly read three times and ratified this the 2<sup>nd</sup> day of August, 2007.

s/ Marc Basnight  
President Pro Tempore of the Senate

s/ Joe Hackney  
Speaker of the House of Representatives

s/ Michael F. Easley  
Governor

Approved 10:19 p.m. this 31 day of August, 2007