

Performance Standards for Sustainable, Energy-Efficient Public Buildings Consolidated Report Required under G.S. 143-135.39(g)

February 17, 2010

Introduction

Per G.S. 143-135.39, the Department of Administration is responsible for administering the Sustainable Energy-Efficient Buildings Program. The Department has completed the directives in the statute, including creation of an Advisory Committee, development of policies and technical guidelines, and conducting education and training.

A report from the Sustainable, Energy-Efficient Buildings Advisory Committee can be found on the State Construction Website along with a series of technical standards for energy and water efficiency.¹ A procedures flow chart is also provided.²

Most of the Sustainable, Energy-Efficient Buildings Advisory Committee work was done in the calendar year 2008, highlighted by a two-day Buildings Efficiency Conference on October 29 and 30, 2008.³

As part of the Sustainable, Energy-Efficient Public Buildings legislation, the Department is responsible for providing a consolidated report, including a performance review, State Building Commission report, and recommendations for improving the standards. The following information makes up that Consolidated Report.

Performance Review

The first item in the performance review deals with the cost of implementing the energy-efficiency and water use standards. In budgeting funds for new buildings, it is estimated that a premium of between 2% and 4% should be added to account for energy-efficient design and construction. This premium includes additional design costs such as advanced planning and computer modeling of the buildings, as well as additional cost for commissioning. Additional construction costs for high-efficiency building systems are also included in the premium.

A case study cost/benefit analysis was performed by the Advisory Committee co-chairs, which shows a 2.5% premium cost for the more-efficient buildings.⁴ However a credit

¹ Advisory Committee Report
<http://www.nc-sco.com/Guidelines/EEREPORT.pdf>

² Procedures Flow Chart
<http://www.nc-sco.com/Guidelines/Energy%20Efficient%20Bldgs%20Advance%20Planning%20Flow%20Chart.pdf>

³ NC State Buildings Efficiency Conference October 29-30 2008
<http://www.energync.net/conference/presentations2.html>

⁴ Case Study: Representative Economic Impacts of G.S. 143-135.35 through G.S. 143-135.40
<http://www.energync.net/conference/presentations/Oct%2029/Case%20Study-Brinkley.pdf>
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was taken for an irrigation system that may not occur on other projects, without which the premium cost would have been 3.3%. This percentage is within the general budget recommendations of between 2% and 4%.

Another section of the Performance Review deals with operating savings, particularly the utility savings. Standards are in place to ensure that buildings are designed to use 30% less energy than a basic code-compliant building, including a form to be completed by the designer.⁵ As the legislation was codified approximately 18 months ago, buildings subject to the standards have not yet been constructed and occupied, so the savings on actual utility bills has yet to be confirmed. For the case study referenced previously, the cost savings came out to be \$0.36/ft²/year for a new office/classroom building.

Impacts on employee productivity have yet to be determined and will be difficult to quantify with engineering analysis.

So far, the legislation, and the standards developed to administer the program, have been effective in requiring architects and engineers to design new buildings that are 30% more energy-efficient than code and use 20% less water. The reporting forms filled out by the designers provide a trail of documents to validate this improved efficiency. However, until the first buildings are done with construction and occupied for at least one year, the actual savings measured at the utility meters has yet to be verified.

The possible need for additional, stricter standards is addressed under Improvements to Energy Efficiency Standards section below.

The size of buildings subject to this legislation, 20,000 square feet and larger, is a valid minimum, and applying the standards to smaller buildings, with a few exceptions such as power plants and data centers, would reach diminishing returns.

The Advisory Committee has identified some technical corrections needed for these energy-efficiency statutes:

- 143-135.37(a) should be revised for compliance with the legislative intent stated in 143-135.35. The current wording allows major facilities financed through local funding to avoid compliance with the program requirements. The language about funding from "an appropriation in the State capital budget or through a financing contract" needs to be removed from the statute.
- In 143-135.37(c) the word "stormwater" should be changed to "groundwater" throughout in accordance with SB 668 and the definition of "potable", as groundwater is typically potable but stormwater is not.

⁵ Energy Model Compliance Report

<http://www.nc-sco.com/Forms/General%20Building%20Energy%20Model%20Information%2010%2001%2009.xls>

- For 143-135.37(c) the basis of calculating outdoor water savings needs to be revised since there are no requirements addressed by the North Carolina State Building Code. Replace the building code language with “on the basis of conventional irrigation of landscaped areas”.

In addition to the technical corrections described above, it would be helpful to reference energy cost savings in the legislation rather than simply energy savings. An emphasis on cost savings will help reduce utility costs through rate negotiations with the public utility and installation of peak shaving systems such as thermal storage. Currently there is no reward in the legislation for achieving energy cost savings.

State Building Commission Report

There have not been any applications to the State Building Commission to exempt a project from the requirements of the Sustainable Energy-Efficient Buildings Program.

Improvements to Energy Efficiency Standards

Under G.S. 143-135.40, the Department is responsible for monitoring the development of improved energy-efficiency standards, and recommending any stricter or additional requirements.

The Sustainable Energy-Efficient Buildings Program standards described in G.S. 132-135.37(b) require a building to be designed 30% more efficient than ASHRAE 90.1-2004, which is the basis for the current energy code. The 2009 North Carolina Energy Conservation Code also references ASHRAE 90.1-2004 as the basic standard, so the existing State standards continue to exceed minimum code compliance by 30%.

It is forecast that the 2012 NC Building Code will become 30% more efficient, which will meet or exceed the current State efficiency standards. By 2012 the Sustainable Energy-Efficient Buildings Program standards will likely be obsolete, and a recommendation for improving the State standards will be made prior to 2012.

The life-cycle cost statute G.S. 143-64.15 is recommended for update soon in coordination with the Sustainable Energy-Efficient Buildings Program.

The NC Office of State Construction, Department of Administration prepared the consolidated report. The NC State Energy Office and other agencies contributed to the content of the report.

The Department of Administration wishes to express appreciation to the members of the Sustainable, Energy-Efficient Buildings Advisory Committee for providing their time and expertise to the work on the Committee.

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