

GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2007

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SENATE BILL 668
Commerce, Small Business and Entrepreneurship Committee Substitute Adopted
7/18/07
Third Edition Engrossed 7/24/07

Short Title: Energy Conservation in State Buildings. (Public)

Sponsors:

Referred to:

March 12, 2007

A BILL TO BE ENTITLED

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 1.1. Chapter 143 of the General Statutes is amended by adding a
new Article to read:

"Article 8C.

"Energy and Water Efficient Public Buildings.

"§ 143-135.35. Findings; legislative intent.

(a) 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.

(b) 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 Article 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

1 provide economic development to North Carolina and to meet the objectives of this
2 Article.

3 **"§ 143-135.36. Definitions.**

4 As used in this Article, the following definitions apply:

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

26 **"§ 143-135.37. Standard for major facilities; reports by agencies and the**
27 **Department.**

28 (a) All major facility projects of public agencies shall be designed, constructed,
29 and certified to at least a thirty percent (30%) greater energy efficiency than the
30 standard under ASHRAE 90.1-2004. For major renovations a twenty percent (20%)
31 greater energy efficiency standard than ASHRAE 90.1-2004 shall be used. In addition,
32 for new construction, the water systems shall be designed and constructed to use a
33 minimum of twenty percent (20%) less potable water than the indoor water use baseline
34 calculated for the building after meeting the fixture performance requirements required
35 by the 2006 *North Carolina Plumbing Code*. Outdoor potable water or harvested ground
36 water consumption shall be reduced by a minimum of fifty percent (50%) over that
37 consumed by conventional means through water use efficient landscape materials and
38 irrigation strategies, including water reuse and recycling. This subsection applies to
39 major facility projects that have not entered the schematic design phase prior to the
40 effective date of this section.

41 (a1) For the purposes of this Article, any exceptions or special standards for
42 specific types of buildings or building facilities found in ASHRAE 90.1-2004 are
43 included in the ASHRAE 90.1-2004 standard under subsection (a) of this section.

1 (b) Commissioning for Major Facilities. – Building and/or system
2 commissioning practices, tailored to the size and complexity of the building and its
3 system components, shall be employed in order to verify performance of building
4 components and systems and help ensure that design requirements are met upon
5 completion of construction.

6 (c) Measurement and Verification for Major Facilities.

7 (1) Building level owner's meters for electricity, natural gas, fuel oil,
8 water, etc., in accordance with United States Department of Energy
9 (DOE) guidelines issued under Section 103 of the Energy Policy Act
10 of 2005 shall be installed. The public agency and the designers shall
11 compare metered data from the first 12 months of building operation
12 with the energy design target(s) and report that performance to the
13 State Construction Office.

14 (2) If the average building energy or water consumption over the one year
15 period following the date of beneficial occupancy is eighty-five
16 percent (85%) or less than the performance goals established by these
17 standards, the designer, owner agency, contractor, Contract Manager at
18 Risk, and commissioning agent shall investigate, determine the cause
19 of the shortfall, and recommend corrections or modifications to meet
20 performance goals.

21 (d) The Department shall consolidate the reports required in this section and any
22 report from the State Building Commission under G.S. 143-135.39 into one report and
23 report to the Chairs of the General Government Appropriations Subcommittees of both
24 the Senate and the House of Representatives, the Environmental Review Commission,
25 and the Joint Legislative Commission on Governmental Operations by November 1 of
26 each year beginning in 2008. In its report, the Department shall also report on the
27 implementation of this Article including reasons why the standards required in
28 subsection (a) of this section were not used for the reason that it would not be
29 practicable in accordance with G.S. 143-135.39. The Department shall make
30 recommendations regarding the ongoing implementation of this Article, including a
31 discussion of incentives and disincentives related to implementing this Article.

32 **"§ 143-135.38. Guidelines for administering Article; other considerations**
33 **regarding project proposals.**

34 (a) The Department, in consultation with affected public agencies, shall develop
35 and issue policies and technical guidelines to implement this Article for public agencies.
36 The purpose of these policies and guidelines is to define procedures and methods for
37 complying with the criteria and performance goals for major facility projects defined by
38 § 143-135.37.

39 (b) As provided in the request for proposals for construction services, the public
40 agency may hold a preproposal conference for prospective bidders to discuss
41 compliance with, and achievement of, standards identified in this Article for prospective
42 respondents.

43 (c) The Department shall create a sustainable, energy efficient buildings
44 advisory committee comprised of representatives from the design and construction

1 industry involved in public works contracting, personnel from the affected public
2 agencies responsible for overseeing public works projects, and others at the
3 Department's discretion to provide advice on implementing this Article. Among other
4 duties, the advisory committee shall make recommendations regarding an education and
5 training process for stakeholders and an ongoing evaluation or feedback process to help
6 the Department implement this Article. The advisory committee may also make
7 recommendations to the Department regarding water efficiency requirements and
8 energy efficiency requirements.

9 (d) The Department shall review the advisory committee's recommendations
10 under subsection (c) of this section regarding education and training. The Department
11 shall develop one level of education and training requirements for the chief financial
12 officer of each public agency that is appropriate for the chief financial officer's level of
13 involvement in projects under this Article. The Department shall develop, for each
14 public agency that is responsible for the payment of the agency's utilities, another higher
15 level of education and training requirements for the facility manager of the agency that
16 is appropriate for the facility manager's level of involvement in projects under this
17 Article. This level of education and training shall also be a requirement for the capital
18 project coordinator of an agency involved in a project under this Article. The
19 Department shall develop a highest level of education and training requirements for the
20 architects and mechanical design engineers that are involved in the design of projects
21 under this Article that is appropriate for their level of involvement in these projects.

22 (e) The Department may adopt rules to implement this Article. The Department
23 may adopt architectural or engineering standards as needed to implement this Article.

24 **"§ 143-135.39. Use of other standard when ASHRAE standard not practicable.**

25 When the Department, public agency, and the design team determine the ASHRAE
26 90.1-2004 standard to be not practicable for a major facility project, then it must be
27 determined by the State Building Commission if the standard is not practicable for that
28 major facility project. If the State Building Commission determines the standard is not
29 practicable for that major facility project, the State Building Commission shall
30 determine which standard is practicable for the design and construction for that major
31 facility project. If the ASHRAE 90.1-2004 standard is not followed for that project, the
32 public agency shall report this information and the reasons to the Department in its
33 report under G.S. 143-135.37, and the State Building Commission shall report this
34 information and the reasons to the Department."

35 **SECTION 1.2.** G.S. 115D-20 is amended by adding a new subdivision to
36 read:

37 "(14) To comply with the design and construction requirements for energy
38 and water efficient public buildings under Article 8C of Chapter 143 of
39 the General Statutes."

40 **SECTION 1.3.** The Department of Administration shall monitor the
41 development of construction or other energy efficiency standards to determine whether
42 there is a standard that the Department and the energy efficient buildings advisory
43 committee, established under G.S. 143-135.38, as enacted in Section 1.1 of this act,
44 determine would better fulfill the intent of Article 8C of Chapter 143 of the General

1 Statutes, as enacted by Section 1.1 of this act, to achieve energy efficiency and
2 increased energy savings in major facility projects, as defined in G.S. 143-135.36, as
3 enacted in Section 1.1 of this act, in buildings of the State, The University of North
4 Carolina, and the North Carolina Community College System than the ASHRAE
5 90.1-2004 standard defined in G.S. 143-135.36, as enacted in Section 1.1 of this act,
6 and, if so, whether Article 8C of Chapter 143 of the General Statutes, as enacted in
7 Section 1.1 of this act, should be amended to provide for the use of this standard rather
8 than the ASHRAE 90.1-2004 standard under that Article. Specifically, the Department
9 of Administration shall monitor the development of improved energy efficiency
10 standards developed by the American Society of Heating, Refrigerating and
11 Air-Conditioning Engineers, the ASHRAE standards, and monitor whether the State
12 Building Code Council adopts improved ASHRAE standards or any other energy
13 efficiency standards for inclusion in the State Building Code under Article 9 of Chapter
14 143 of the General Statutes that result in greater energy efficiency and increased energy
15 savings in major facility projects in State, University System, and community college
16 buildings. No later than January 1, 2009, and again January 1, 2010, the Department of
17 Administration shall report to the Chairs of the General Government Appropriations
18 Subcommittees of both the Senate and the House of Representatives, the Environmental
19 Review Commission, and the Joint Legislative Commission on Governmental
20 Operations on the results of its monitoring under this section, including any
21 recommendations for administrative or legislative proposals.

22 **SECTION 1.4.(a)** The Department of Administration shall conduct a
23 performance review of the energy and water efficient buildings program established
24 under Article 8C of Chapter 143 of the General Statutes, as enacted by Section 1.1 of
25 this act. The performance review shall include at least all of the following:

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

38 **SECTION 1.4.(b)** No later than December 1, 2010, the Department of
39 Administration shall make a preliminary report of its findings under its performance
40 review under subsection (a) of this section and its recommendations and, on or before
41 December 1, 2011, a final report to the Chairs of the General Government
42 Appropriations Subcommittees of both the Senate and the House of Representatives, the
43 Environmental Review Commission, and the Joint Legislative Commission on
44 Governmental Operations.

1 **SECTION 1.5.** Article 6 of Chapter 146 of the General Statutes is amended
2 by adding a new section to read:

3 **"§ 146-23.2. Purchase of buildings constructed or renovated to a certain energy**
4 **and water efficiency standard.**

5 (a) A State agency shall not acquire by purchase any building unless the building
6 was designed and constructed to at least the same standard for energy and water
7 efficiency that the design and construction of a comparable building was required to
8 meet under applicable State law or local ordinance at the time the building under
9 consideration for purchase was constructed.

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

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

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

- 23 (1) Lighting Systems. – The installation of exit signs that employ
24 light-emitting diode (LED) technology; the replacement of
25 incandescent light bulbs with compact fluorescent light bulbs; and
26 where appropriate, as determined by the Department of
27 Administration, the installation of occupancy sensors or optical
28 sensors.
- 29 (2) Water Systems. – The installation of aerators in sink faucets that
30 reduce the flow of water to a rate of no more than five-tenths gallons
31 per minute (.5 g.p.m.); the installation of shower heads that reduce the
32 flow of water to a rate of no more than one and five-tenths gallons per
33 minute (1.5 g.p.m.); where appropriate, as determined by the
34 Department of Administration, the resetting of hot water heaters to a
35 water temperature of 120 degrees; the training of staff to monitor the
36 use of irrigation systems and to base the use of the system on the
37 moisture content of the soil, and either the elimination of potable water
38 for irrigation or the reduction of water consumption in the building by
39 twenty percent (20%) based on water consumption for the 2002-2003
40 fiscal year.
- 41 (3) Heating, Ventilation, and Air-conditioning (HVAC) Systems. – For
42 HVAC equipment that is subject to replacement, the review of the
43 specifications for the replacement HVAC equipment to ensure that it is
44 not oversized; and, for building automation systems that are

1 programmable, the training to ensure that these systems are properly
2 programmed.

3 (4) Minor Equipment. – For minor motorized equipment that is subject to
4 replacement, the replacement of minor equipment with equipment that
5 has premium efficiency motors. For purposes of this subdivision,
6 'premium efficiency motor' means a motor that meets or exceeds a set
7 of minimum full-load efficiency standards developed by the National
8 Electrical Manufacturers Association (NEMA), the NEMA standards.

9 (5) For retrofit of existing buildings that require no significant expenditure
10 of funds: Disconnect lamps in drink vending machines. Use power
11 save feature on computers, monitors, copiers, fax machines and other
12 office equipment. Purchase only Energy Star office equipment and
13 appliances.

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

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

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

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

34 "**§ 143-64.12. Authority and duties of State agencies;the Department; State**
35 **agencies and State institutions of higher learning.**

36 (a) The Department of Administration through the State Energy Office shall
37 develop a comprehensive program to manage energy, water, and other utility use for
38 State agencies and institutions of higher learning and shall update this program
39 annually. Each State agency and State institution of higher learning shall develop and
40 implement a management plan that is consistent with the State's comprehensive
41 program under this subsection to manage energy, water, and other utility use. The
42 energy consumption per gross square foot for all State buildings in total shall be reduced
43 by twenty percent (20%) by 2010 and thirty percent (30%) by 2015 compared to the
44 2003 baseline. Each State agency and State institution of higher learning shall update its

1 management plan annually and include strategies for supporting this reduction. Each
2 community college shall submit to the State Energy Office an annual written report of
3 utility consumption and costs.

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

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

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

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

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

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

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

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

1 **"§ 143-64.10. Findings; policy.**

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

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

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

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

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

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

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

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

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

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

17 **"§ 143-64.15A. Certification of life-cycle cost analysis.**

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

31 **SECTION 5.** This act becomes effective only if funds are appropriated
32 during the 2007 General Assembly to implement this act, and if funds are appropriated
33 it becomes effective December 1, 2007. Sections 1.1 and 1.2 apply to contracts for the
34 design of major facility projects, as defined in G.S. 143-135.36 as enacted in Section 1.1
35 of this act, that are entered into on or after December 1, 2007. Section 4.1 applies to
36 life-cycle cost analyses commenced, and to contracts entered into for life-cycle cost
37 analyses, on or after December 1, 2007.