



Australian Building Codes Board

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Environment and Resources
Committee

Rob Hansen
Research Director
Environment and Natural Resources Committee
Parliament House
BRISBANE QLD 4000

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Dear Mr Hansen,

On the 12 June I received a letter from yourself in your capacity as Research Director of the Environment and Resources Committee of the Queensland Parliament, inviting the Australian Building Codes Board to make a submission to the Inquiry into Energy Efficiency Improvements. The Australian Building Codes Board wishes to thank you for this opportunity.

The Australian Building Codes Board supports the notion of improved energy efficiency in buildings. However, we would ask the committee to note the previous work of the Australian Building Codes Board in improving the energy efficiency of buildings through the Building Code of Australia. This work has included the introduction of energy efficiency provisions for housing in 2003, the broadening of energy efficiency provisions to cover all residential buildings such as apartments, hotels and hotels and all commercial, public and industrial buildings in 2005 and 2006 respectively, and an increase in the stringency of the energy efficiency provisions for housing also in 2006.

A recent COAG announcement directed the Australian Building Codes Board to further increase the stringency of the energy efficiency provisions for all classes of buildings. These provisions are subject to the outcomes of a Regulation Impact Statement and public comment but are proposed for adoption in BCA 2010.

Attached is the Australian Building Codes Board's response to the Terms of Reference of this Inquiry.

Yours sincerely,

Graham Huxley
Chairman
5 August 2009

**Submission by the Australian Building Codes Board (ABCB) to the
Environment and Resource Committee of the Queensland Parliament
*Inquiry into Energy Efficiency Improvements***

1. Introduction

The Australian Building Codes Board (ABCB) is a joint initiative of all levels of Australian Government and includes representatives from the building industry. The Board was established by an inter-governmental agreement signed by the Australian Government and State and Territory Ministers responsible for building regulatory matters on 1 March 1994 and reaffirmed by Ministers in 2001 and 2006.

The Board consists of five industry representatives, a representative of the Australian Government, senior executives responsible for building regulatory matters from all State and Territory Governments, and a Local Government representative. The ABCB reports directly to the Australian Government, State and Territory Ministers responsible for building regulatory matters, and provides a vital link for the building industry between building practice and Government building regulatory policy.

The Board's mission is to address issues relating to health, safety, amenity and sustainability by providing for efficiency in the design, construction and performance of buildings through the Building Code of Australia (BCA) and the development of effective regulatory systems.

The BCA is a national building code which is developed and maintained by the ABCB on behalf of the Commonwealth and the State and Territory Governments, who each have statutory responsibility for building control and regulation within their jurisdiction. The BCA contains provisions for the design and construction of buildings and other structures, covering such matters as structural safety, fire safety, access and egress, services and equipment, certain aspects of health and amenity, and energy efficiency.

The BCA is referred to as a 'performance-based' code, describing acceptable Performance Requirements that buildings and other structures throughout Australia must meet. This allows cost savings in building construction by:

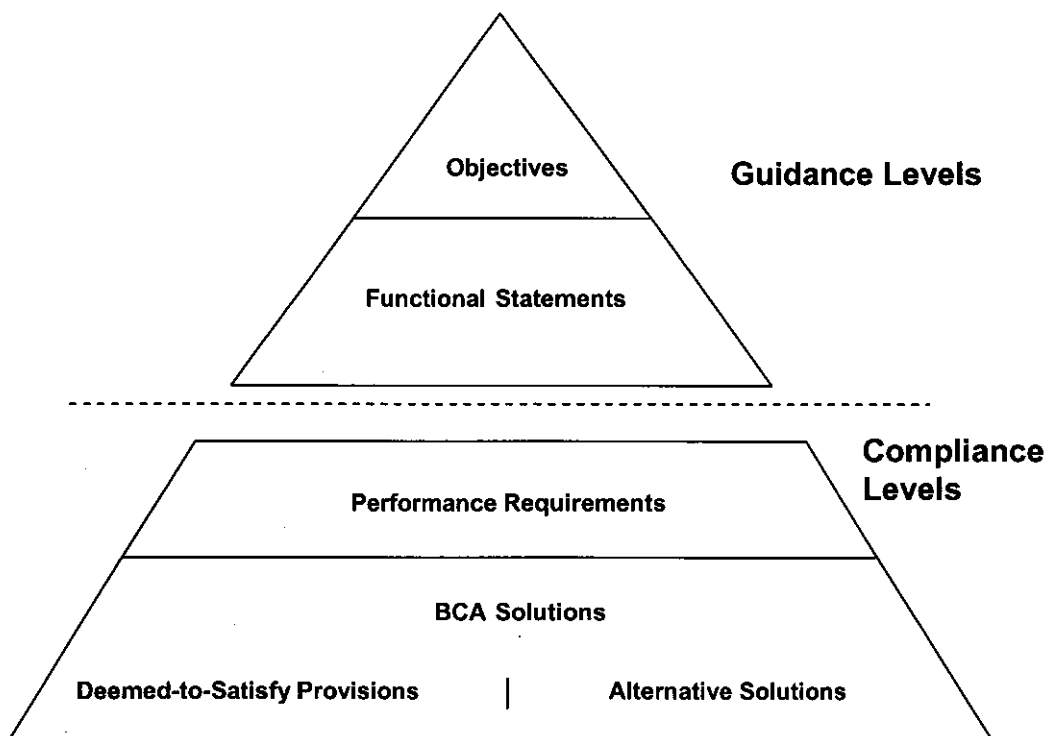
- allowing the use of alternative or innovative materials and forms of construction or designs;
- allowing designs to be tailored to a particular building;
- being clear and providing guidance on what the BCA is trying to achieve; and
- allowing the designer flexibility while still allowing existing building practices through Deemed-to-Satisfy Provisions.

Allowing for innovation is particularly relevant in developing energy measures, because technologies are rapidly emerging as the community and industry become more conscious of energy efficiency issues.

The performance-based BCA has a hierarchy that starts with an Objective and is followed by Functional Statements, Performance Requirements and Building Solutions (see Figure 1 below). Generally, it is the Performance Requirements that are recognised under building law. The Objective is the broad societal goal, while the Functional Statement describes what the building needs to do to meet the Objective.

BCA Performance Requirements must be satisfied by the design and construction of the building. There are two types of Building Solutions to meet the Performance Requirements:

1. Using the **Deemed-to-Satisfy Provisions**. The Deemed-to-Satisfy Provisions are detailed prescriptive technical requirements of how the building is to be constructed and equipped. Most building designers choose to develop a solution following the Deemed-to-Satisfy Provisions. These Provisions include reference to technical details found in Australian Standards.
2. Using an **Alternative Solution**. An Alternative Solution is one that can be demonstrated to meet the Performance Requirements of the BCA by other means. The Alternative Solution path allows for new ways of achieving the required levels of performance. The onus is on the building applicant to show that the Alternative Solution complies with the Performance Requirements.



The BCA is amended annually in May to reflect changes in building practices, usage and technology. The BCA change process follows an agreed procedure that is both consultative and as transparent as possible, while respecting confidentiality. It includes preparation of a detailed technical proposal (Regulation Document) and, as required under Council of Australian Government (COAG) arrangements, a Regulatory Impact Statement for broad community consultation.

1.1. Energy Efficiency in the BCA

In response to concerns over global warming, the Australian Government announced in July 2000 that agreement had been reached with industry and the State and Territory Governments to adopt a two-pronged approach to reducing greenhouse gas emissions from buildings. The first approach was the introduction of mandatory minimum energy performance requirements through the BCA, and the second approach was the encouragement of best practice voluntary initiatives by industry.

Industry was supportive of this two-pronged approach, taking the view that all building related matters should be consolidated into the BCA.

Currently the BCA has energy efficiency requirements for residential and commercial buildings in both Volume One and Volume Two of the BCA. These requirements cover areas such as building fabric, glazing, sealing, air-movement, air-conditioning and ventilation, artificial lighting and power, hot water supply and access for maintenance; noting that artificial lighting and power and hot water supply do not currently apply to residential buildings.

On 30 April 2009, the Council of Australian Governments (COAG) announced its reaffirmed commitment to introducing the National Strategy for Energy Efficiency (NSEE) to help households and businesses reduce their energy costs, improve productivity of the economy and reduce the cost of greenhouse gas abatement under the Carbon Pollution Reduction Scheme (CPRS). As a first step, COAG requested the Australian Building Codes Board (ABCB) increase the energy efficiency provisions in the 2010 edition of the Building Code of Australia (BCA).

In brief the increase in energy efficiency provisions of BCA 2010 requires:

- (i) a 6 star energy rating, or equivalent, for new residential buildings; and
- (ii) a significant increase in the energy efficiency requirements for all new commercial buildings; and
- (iii) the inclusion of energy efficiency requirements for hot water in new houses and lighting in new houses and apartments.

All proposed changes to the energy efficiency requirements of BCA 2010 are subject to regulatory impact assessment. The public comment draft of BCA 2010 is currently available for comment on the ABCB website, www.abcb.gov.au.

2. Response to the Terms of Reference

2.1 The economic and environmental costs and benefits arising from energy efficiency improvements

Under COAG regulatory principles, the ABCB is committed to undertaking thorough impact assessments of all proposals for new or changes to existing regulation within the BCA. This impact assessment is used to determine the likely impacts that the new regulation will have on industry, government and the community as a whole. In order for a regulatory change to be adopted it must achieve a positive benefit to cost ratio.

All proposed changes to the energy efficiency requirements of the BCA that are proposed for adoption in BCA 2010 will be subject to the outcomes of a Regulatory Impact Statement (RIS). This RIS will assess the economic, social and environmental impacts of the proposed changes and will establish the costs and benefits of the more stringent energy efficiency provisions. The RIS is scheduled for release for public comment in September 2009.

The adoption of energy efficiency provisions into the BCA in previous editions of the BCA were also subject to the outcomes of a RIS. Energy efficiency provisions were first introduced into the BCA in 2003 for housing, with the main findings of the RIS being-

- A reduction in greenhouse emissions by a cumulative total of 1.51 million tonnes of CO₂ equivalent in the period to 2010. As the stock of more energy efficient buildings accumulate, annual savings will reach 0.38 million tonnes by 2010.
- In present value terms (2003), compliance with the new measures will see an additional \$665 million invested for the period from 2003-2010.
- Dwelling constructed during the period 2003-2010 will require less energy for heating and cooling than homes built to original measures. In present value terms (2003), operational energy savings, discounted over a 30 year lifespan at 5% a year, were estimated at being \$1,150 million.
- The net present value (2003) of the BCA changes is about \$485 million.

In BCA 2005, the energy efficiency provisions of the BCA were broadened to apply to other residential buildings such as apartments, hotels and motels. The main findings of the RIS for these proposed changes were-

- In present value terms (2004) over a 40 year time horizon, energy cost savings of \$31.2 million; capital cost savings through reductions in installing heating, ventilation and air-conditioning equipment (HVAC) of \$14.5 million; and benefits of \$8.2 million due to reduced greenhouse gas emissions.
- In present value terms (2004) over the same period, costs of \$32.4 million.
- The net present value (2004) of the BCA changes is about \$21.5 million.

The energy efficiency provisions of the BCA were then further broadened to apply to commercial, public and industrial buildings. These provisions were subject to the outcomes of a RIS and were adopted into the BCA in BCA 2006. The main findings of the RIS were-

- A growth in annual energy savings from 900 million MJ/year in 2007 to 9,760 million MJ/year in 2016, as the stock of more energy efficient buildings accumulates. Annual greenhouse savings would increase from 0.3 Mt CO₂e in 2007 to 3.2 Mt CO₂e in 2016;

- In 2010, the measures will reduce annual emissions by about 1.2 Mt CO₂e;
- In present value terms (2006), around \$680 million would need to be invested to achieve these outcomes;
- There are significant non-greenhouse benefits, being the dollar value of the energy reductions plus reductions in the size of air-conditioning plant that need to be installed in more efficient buildings. In present value terms, the combined total of the benefits is estimated at \$3.4 billion, which is 4.9 times the cost of implementing the Deemed-to-Satisfy (DTS) provisions;
- The net present value (2006) of the BCA changes is about \$2.7 billion.

Table 1 provides a summary of the estimated impacts of the revised measures on newly constructed floor space, assuming the DTS provisions of the BCA will be adopted in all new floor space.

Table 1 Estimated national impacts

<i>Impact measure</i>	<i>First year of the regulation, 2007</i>	<i>Cumulative impact, 2007-2010</i>	<i>Cumulative impact, 2007-2016</i>
Energy savings (million MJ/year, end year)	900	3,685	9,671
Reduced emissions (Mt CO ₂ e/year, end year)	0.297	1.219	3.199
Cost of DTS provisions (\$M, present value)	78	298	677
Benefit of DTS provisions (\$M, present value)	386	1,470	3,343
Net benefit (\$M, present value)	308	1,172	2,666
Benefit/cost ratio		4.9	

The energy efficiency provisions for housing adopted into the BCA in 2003 were amended to an increased level of stringency in 2006. After undertaking a RIS it was found that adoption of the new measures would see a net present value (2006) of \$429 million.

From the above, it is anticipated that the proposed more stringent energy efficiency provisions proposed for BCA 2010 are likely to increase benefits such as annual energy savings and reductions in annual emissions. It is also anticipated that the proposed provisions are also likely to lead to an increase in construction costs.

2.2 Potential barriers and impediments to improved energy efficiency

A potential barrier or impediment to improved energy efficiency may be the market confusion that has resulted from the proliferation of sustainability rating and assessment tools in Australia. With the proliferation of these tools have come varying rating mechanisms. For example AccuRate assesses using a 0-10 star rating while Green Star uses 0-6stars.

Another potential barrier or impediment to improved energy efficiency may be the anticipated likely costs associated with an increase in the stringency of energy efficiency provisions. All regulatory changes to the BCA are required to achieve a positive benefit to cost ratio which becomes more difficult to achieve as the energy efficiency stringency increases, particularly for temperate climate areas.

2.3 Potential policy options for energy efficiency improvements, with an emphasis on initiatives that are cost effective for individual producers and consumers

In October 2008, COAG agreed to develop a National Strategy on Energy Efficiency (NSEE) to accelerate energy efficiency improvements. This strategy is designed to form a national approach to substantially improve minimum standards for energy efficiency. For buildings, COAG agreed to increase the stringency of the energy efficiency requirements for all classes of buildings in the BCA.

COAG has requested a national approach through the BCA to increasing the energy efficiency requirements for buildings. As a result of this the ABCB has increased the stringency of the energy efficiency requirements currently covered in the BCA and have introduced requirements for hot water in new houses and lighting in new apartments and houses. These requirements have been included in the BCA 2010 public comment draft which is currently available for public review. Subject to the comments received and the outcomes of the RIS, which will require the changes to achieve a positive benefit to cost ratio, these requirements will be adopted into BCA 2010.

In the interest of national consistency in building regulation, the ABCB would strongly discourage the introduction by individual State or Local Governments of any energy efficiency requirements that affect buildings that overlap or conflict with the BCA.

2.4 The role of the Carbon Pollution Reduction Scheme and other Commonwealth initiatives in encouraging energy efficiency

No ABCB comment.