



**Submission from Australian Building Codes  
Board (ABCB) Chairman**

**Productivity Commission Inquiry into  
Regulatory and Policy Barriers to Effective  
Climate Change Adaptation – Draft Report**

**June 2012**

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### **SUMMARY OF RECOMMENDATIONS**

In response to the draft Productivity Commission draft report the ABCB Chairman provides the following recommendations for consideration in finalising the report:

- 1. That the draft report is amended to specifically address which authority is responsible for certain recommendations/observations to avoid confusion over where action is required particularly in the area of building and planning, and between the various levels of government.**
- 2. That additional research and more reliable data is required on specific climate impacts, such as cyclonic events, bushfires and intense rainfall, to ensure that standards can be adequately reviewed to take account of longer term trends.**
- 3. That the draft report recognise that probability density functions for a broader range of climate related hazards including cyclones, floods, bushfires, hail and intense rainfall in different regions would help in setting standards for buildings to make them more resilient to climate change.**
- 4. That a central body be established to coordinate national planning matters.**
- 5. That building and planning delineation be further refined to ensure clearer regulatory relationships and responsibilities.**
- 6. That the draft report recognise that the need for regulation to be cost effective under the COAG Best Practice Regulation Guidelines may not always result in a regulatory change to deal with adaptation to climate change.**
- 7. That broadening of the ABCB's mandate to include building durability (property protection) will require a more considered analysis of the overall impact on the building regulation framework and the role of private sector insurance. Also, because of the impact on construction costs this issue will require careful consideration by Governments.**
- 8. That a greater focus be placed on how existing buildings can be made more resilient to the affects of climate change.**

## 1 Introduction

The ABCB is a Council of Australian Government (COAG) standards writing body that is responsible for the National Construction Code (NCC) which comprises the Building Code of Australia (BCA) and the Plumbing Code of Australia (PCA). COAG has signalled its intent to combine all onsite building regulation into the NCC, with gas regulation currently being assessed and electrical and telecommunication likely to be considered in future. It is a joint initiative of all three levels of government in Australia and was established by an inter-government agreement (IGA) signed by the Commonwealth, States and Territories on 1 March 1994. A new IGA was signed by Ministers, with effect from 30 April 2012.

The Board's mission is to address issues of safety and health, amenity and sustainability in the design, construction and performance of buildings. It is also a regulatory reform vehicle for COAG.

The Board consists of an independent Chairman, up to five industry representatives (currently four), 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 BCA and PCA are national codes which are developed and maintained by the ABCB on behalf of the Australian and the State and Territory Governments, who each have statutory responsibility for building control and regulation within their jurisdiction. Both codes contain the minimum necessary requirements for building construction and plumbing in Australia. It is considered that the BCA is most relevant to the Productivity Commission's report.

**Attachment 1** provides a summary of projects currently being undertaken by the ABCB relating to the adaptation and resilience of buildings against natural hazards.

It is acknowledged that the BCA can contribute to the resilience of the Australian building stock but there are limitations to how far it can do this. There are a number of policy settings which recognise the ABCB's role in mitigating the impact of climate change on buildings; they include:

- COAG National Strategy for Disaster Resilience;
- COAG National Climate Change Adaptation Framework;
- COAG Principles of Best Practice Regulation; and
- IGA on building regulation reform of 30 April 2012 which gives expression to the COAG policies for regulation of the design and construction of new buildings and new building work

This submission is made by the Chairman of the ABCB, Mr John Thwaites. This submission does not necessarily represent the views of the ABCB members.

## 2 General comments

The Commission's view that climate change impacts need to be appropriately incorporated into the BCA and its referenced standards is supported.

The ABCB is committed to comprehensively reviewing and considering the impacts of climate change in relation to all relevant new regulatory initiatives. The ABCB supports having robust processes in place to ensure the BCA adequately addresses future climate change impacts that are continually refined and improved.

The ABCB has traditionally relied on historical climate and weather data in setting standards. However more recently the ABCB has sought to utilise scientifically based climate change projections in its review of wind standards for construction in cyclone-affected areas.

In the draft report the combining of planning and building regulation matters in the key points under Chapter 8 and in some areas of the general discussion, leads to confusion over where action is required. Likewise, there is a distinction to be made between the ABCB and State and Territory building regulators. The ABCB produces and publishes the BCA with State and Territory building regulators implementing and enforcing the BCA.

State and Territory regulators have the power to vary the BCA in their own jurisdictions and are responsible for all building regulatory matters, including matters outside of the ABCB's remit such as the regulation of temporary structures. The draft report could benefit from specifically addressing which authority is responsible to avoid confusion over where action is required.

### **Recommendation 1**

*That the draft report be amended to specifically address which authority is responsible for certain recommendations/observations to avoid confusion over where action is required particularly in the area of building and planning, between the various levels of government.*

### **3 Assessing climate change impacts on the BCA**

Buildings designed and constructed in accordance with BCA have a good track record of successfully withstanding recent severe climate related events.

Buildings are currently designed and constructed in accordance with the BCA to withstand climate related hazards such as cyclones and extreme winds, intense rain, bushfire, and to some extent flood, as appropriate to their location. These hazards impose loads and risks to buildings determined mainly by historical records and post event analysis, but also considering available climate data, from which design events with annual probabilities of exceedance are specified.

Building standards have undergone constant review, particularly after major hazard events and via research, to ensure adequate levels of safety and health are maintained for the community. Where the building standards proved to be inadequate, as identified in the wake of Cyclones Althea in 1971 and Tracy in 1974, they were subsequently upgraded. These improved standards for high wind design were later demonstrated to be satisfactory as evidenced by the small number of building failures resulting from Cyclones Vance in 1999, Larry in 2006 and Yasi in 2011.

As noted in the draft report the ABCB has undertaken a study into the impact of climate change on the BCA titled '*An Investigation of Possible Building Code of Australia (BCA) Adaptation Measures for Climate Change*' ("the ABCB Climate Adaptation Report"). This report suggests that by and large, buildings designed and constructed in accordance with the current BCA are likely to be reasonably adequate for climate related hazards anticipated in 50 years time associated with a low emissions scenario. If the climate changes in accordance with high emissions scenarios, the current BCA is likely to be deficient.

The ABCB Climate Adaptation Report does identify some climate change risks that warrant immediate action. The Report points out that there is an increased risk of damage to buildings due to flooding in low lying or coastal areas as a result of climate change. A particular risk is the combination of storm surge with sea-level rise due to climate change. To address the situation the ABCB has prepared a Flood Standard and advisory Handbook relating to the design and construction of buildings in flood prone areas. A Regulatory Impact Statement for the new standards has recently been released.

The ABCB Climate Adaptation Report contains other recommendations for possible adaptation measures for other climate risks. These will be considered in the context of the ABCB's annual work plan as discussed below.

Whatever the emission scenario, climate change impacts both at a regional level in Australia and nationally, require constant monitoring and review to ensure the BCA's established level of safety is proportional to the likely hazard intensity and resultant risk of devastation.

The main impacts of climate change with implications for Australian buildings are:

- increased energy consumption due to higher temperatures
- adverse health effects on building occupants caused by over-heating due to higher temperatures
- increased risk of damage from more intense tropical cyclones, storms and stronger winds
- increased flooding, inundation, and erosion due to more intense rainfall events, sea-level rise and storm surge
- increased bushfires
- increased hailstorms especially in Sydney
- increased moisture variation of clay soils resulting in greater ground movement impacting on foundations and services.

Additional research and more reliable data will be required on specific climate impacts, such as cyclonic events and intense rainfall, to ensure that standards can be adequately reviewed to take account of longer term trends. This further work is required before BCA changes can be justified in accordance with COAG good regulatory principles.

In regard to how climate change and its impacts are taken into account currently, the work of the ABCB is determined by its annual work program which is established annually by the Board and endorsed by the Building Ministers' Forum. Depending on a project's complexity it can be informed by either corporate knowledge, research, consultants, working groups, Standards Australia committees or ABCB committees. When undertaking a project and specifically a change to the BCA for a matter such as risk associated with climate change, all relevant available research is considered. The ABCB Adaptation Report will be a valuable resource that provides a basis for consideration of climate change impacts on the BCA by the Board.

The ABCB supports amending the BCA to account for climate change should future climate data indicate that further changes to the BCA are required and cost-benefit tests predict net benefits to the community. The ABCB will continue to consider climate change as part of all new proposals for change where information is available to assist with decision making.

The recommendation in the draft report that the ABCB should develop a formal work program specifically for climate change is supported but is a matter for consideration by the Building Ministers' Forum. The ABCB has a formal work program and for the past five years has included climate change adaptation activities. In addition, the impacts of climate change are addressed in the current objectives of the 2012 IGA, via the inclusion of sustainability within the Board's mission, providing adequate scope to consider adaptation through existing ABCB processes.

### **Recommendation 2**

***That additional research and more reliable data is required on specific climate impacts, such as cyclonic events, bushfires and intense rainfall, to ensure that standards can be adequately reviewed to take account of longer term trends.***

## 4 Access to better climate change data and research

In order to better assess the future impacts of climate change on the built environment ongoing access to contemporary climate change information including research and data is imperative. The ABCB is not the appropriate organisation to undertake research and collect data of a nature that predicts future weather events. Any research used as a basis for future regulation needs to be robust, peer-reviewed and have the support of the scientific community.

Modelling techniques can be used to assess the potential range of climate outcomes based on current understanding. This information can be presented in the form of a probability density function (PDF), where the median has the highest probability of occurring, but where there is also a chance of outcomes that are either much more benign, or much more damaging. PDFs have been developed for individual elements such as rainfall and temperature. However, it would be of benefit to have PDFs available for a broader range of climate related hazards including cyclones, floods, bushfires, hail and intense rainfall in different regions. This information would help ensure buildings are sufficiently resilient to the impacts of climate change.

### **Recommendation 3**

*That the draft report recognise that probability density functions for a broader range of climate related hazards including cyclones, floods, bushfires, hail and intense rainfall in different regions would help in setting standards for buildings to make them resilient to climate change.*

## 5 Building and planning delineation

Planning control systems determine whether a building can be constructed in an area subject to natural hazards or risks and often work in conjunction with the BCA. Examples of these interactions include regulation relating to flooding and bushfires.

As the coverage of the BCA moves from the traditional safety and health issues associated with building design and construction to sustainability/societal issues such as energy, water, and access for people with disabilities, the distinction between building and planning control systems and other areas of administrative responsibility becomes increasingly blurred.

The overlap of local government regulations and the BCA has been recognised as an issue by several bodies. In 2004 the Productivity Commission found that local governments, through their planning approval processes, were imposing regulations on building. These planning requirements result in regulatory inconsistencies and often lack rigorous regulatory assessment. A study was undertaken by the ABCB to evaluate the impact of local government regulation and the findings indicated that significant additional costs were being introduced as a result.

In February 2007 a Joint Working Group comprising planning, building, environment and energy policy officials, industry and local government was established to investigate the building/planning overlap issue. The Joint Working Group recommended support for a "gateway-model", along the lines of that used in Victoria,



which restricts the ability of local governments to impose requirements already regulated through the BCA. The Joint Working Group also developed a framework, called the National Implementation Model (NIM), to delineate planning and building regulation. Although never formally accepted by Governments, the NIM remains a sound methodology and an area for possible further work.

The gateway model was agreed to in-principle by the Building Ministers Forum in 2008 and is now reflected in the 2012 Inter-Governmental Agreement (IGA), where it states the following:

#### RECITALS

- C. *To strengthen reforms to building and plumbing regulation nationally, the respective governments of the Commonwealth, the States and the Territories commit to:*
- vi *on the part of the Commonwealth, States and Territories, seeking commitments similar to those in this Recital, from their local government and other local government-like bodies where they have any administrative responsibility for regulating the building and plumbing industry, and as far as practicable implementing a 'gateway' model which prevents local governments and other local government-like bodies from setting prescriptive standards for buildings that override performance requirements in the NCC.*

Although building and planning delineation is now embraced by the IGA there is still a need to further refine the building and planning regulatory relationship. A robust system of delineation will reduce regulatory duplication and costs to the community.

In response to reforms to the Ministerial Council system agreed to by COAG on 20 April 2010, all Ministerial Councils lost their remit on 30 June 2011. This included the Local Government and Planning Ministers' Council (LGPMC), which no longer exists. The Planning Official's Group (POG) was a committee of the LGPMC.

In the past, the ABCB worked closely with the POG on matters including bushfires and the broader issue of building planning delineation. Without a central body to coordinate national planning matters and provide advice on building/planning delineation there will be a greater potential for regulatory overlap, duplication and barriers to adaptation.

A lack of building planning delineation presents a barrier to climate change adaptation due to the ongoing uncertainty of responsibility, lack of regulatory rigour at a local level and costs associated with duplicated efforts.

#### **Recommendation 4**

***That a central body be established to coordinate national planning matters.***

#### **Recommendation 5**

***That building and planning delineation be further refined to ensure clearer regulatory relationships and responsibilities.***

## 6 Challenges around the RIS process

Generally any change to the BCA must be evidence based with the problem clearly articulated and the response proportional to the issue being addressed. This is consistent with the ABCB's 2012 IGA obligations.

Developing changes to the BCA to cater for future climate change presents a challenge in terms of complying with the COAG Best Practice Regulation Guidelines. This is because the actual quantum of changes to hazards and risks, as a result of climate change, are uncertain and the timeframe for such impacts are long. Traditional cost benefit analysis may be difficult where risks are uncertain but could be potentially catastrophic if they materialise.

The ABCB undertook a comprehensive regulatory impact analysis of the cyclones proposal that incorporated climate change projections. The ABCB was able to achieve a high degree of rigor in the cost benefit analysis through:

- Identifying alternative climate scenarios with clear assumptions and projections.
- Incorporating a thorough literature review that established a broad consensus view of the likely change in climate, with quantified projections.
- Testing the proposals under all scenarios.

The draft report makes specific reference to the ABCB's recent work on cyclones. It states that even though climate change was a consideration of the research it did not recommend a regulatory change<sup>1</sup>. It should not be expected that the consideration of climate change will always result in a change to regulation.

The ABCB's commitment through the IGA to BCA provisions being cost effective may restrict efforts to make buildings more resilient. The costs change to building design is a real cost that can be easily estimated, while the benefits provided would be in terms of probable reductions in damage, injury or loss of life and are often intangible, difficult to estimate and have a long timeframe.

### **Recommendation 6**

***That the draft report recognise that the need for regulation to be cost effective under the COAG Best Practice Regulation Guidelines may not always result in a regulatory change to deal with adaptation to climate change.***

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<sup>1</sup> The ABCB's Construction in Cyclone Regions project is still under consideration and a final decision is yet to be made.

## 7 Cumbersome and time consuming processes

The draft report claims that changing building and planning regulation in Australia is a cumbersome and an unnecessarily time consuming process and represents a barrier to adaptation. Again the distinction between building and planning in the draft report has not been made. The BCA is constantly reviewed and is updated and republished every year. Regulatory changes are subject to regulatory impact analysis and public consultation as per the COAG guidelines.

The RIS process, although important and critical to the integrity of the process often adds significant time to major projects. It is equally important that robust and thorough consultation is undertaken on all regulatory proposals and in particular not to unnecessarily impact on housing affordability or construction costs.

The draft report states that the Victorian Bushfires Royal Commission (2010) findings in relation to mapping of bushfire risks and developing new bushfire standards as evidence of “*excessively long government review processes [which] could result in inefficient decisions and create a barrier to adaptation*” (p 159).

It is important to note that neither of these issues is the responsibility of the ABCB. Mapping of bushfire risks is a jurisdictional responsibility and is not covered by the BCA, and bushfire standards are the responsibility of Standards Australia, which is not a Government body.

The draft report also states that the Water Services Association of Australia raised concerns regarding the length of time that it takes to update standards under the BCA. Timeframes associated with the development of Australian Standards referenced by the BCA are not the responsibility of the ABCB, although the draft report appears to suggest otherwise.

It is considered that the timeframe for the development of the BCA is insignificant when delivering sound regulatory responses and in the context of the intergenerational nature of climate change.

## 8 Lack of building durability/ property protection in BCA

The primary objectives of the BCA are to establish minimum necessary requirements for health, safety, amenity and sustainability, and that the requirements are cost effective. This primary focus on life safety often also achieves as a consequence, some degree of property protection. However, under the IGA property protection is not a primary objective of the BCA. Recent extreme events show that new buildings have been performing well in terms of preventing structural collapses but property and content losses could still be considerable.

Suggestions in the draft report made by the Insurance Council of Australia to include ‘building durability’ as part of the ABCB’s mission, if added as a specific objective, will add significant upfront costs to construction. The regulation of building durability would also raise the issue of building maintenance, which would represent a whole new area for the ABCB, BCA and jurisdictional regulators.

Broadening of the ABCB's mandate in this area will require a more considered analysis of the overall impact on the building regulation framework and the role of private sector insurance. It is also very clearly a matter that will require careful consideration by Governments.

#### **Recommendation 7**

*That broadening of the ABCB's mandate to include building durability (property protection) will require a more considered analysis of the overall impact on the building regulation framework and the role of private sector insurance. Also, because of the impact on construction costs this issue will require careful consideration by Governments.*

## **9 National database of approved alternative solutions**

The draft report refers to an earlier PC recommendation to develop a repository for alternate design solutions. While sound in theory, the reality is that most alternate design solutions are likely to be in-confidence, either from a commercial or intellectual property perspective. In addition, it is individual local governments or more commonly private certification companies that approve alternative design solutions and certify compliance with the BCA. Therefore, this project would require the cooperation of states and territories accompanied by legislative change to collect and compile this information at a national level if the commercial-in-confidence issues can be resolved. It should also be noted that a repository of alternative design solutions may present a risk in terms of practitioners adopting these solutions as deemed to satisfy options, without considering the specific building design and features to which it is being applied.

## **10 Existing buildings**

Existing buildings present a challenge for climate change adaptation. All new buildings in Australia (including alterations/additions to existing buildings) are required by State and Territory building regulations to be designed and constructed in accordance with the BCA and its referenced documents, other than where there is a state or territory variation. However, due to the non-retrospective nature of building regulation, the BCA is not applicable to existing buildings which form the majority of the building stock.

The study of resilience of a population of buildings in a region is complicated by the fact that the portfolio of the building stock contains many groups of buildings of different ages and strengths. The reasons for the variation in strength of buildings are:

- the rate of deterioration varies with location, detailing, type of materials and maintenance
- design criteria are subject to change from time to time
- portfolio of the stock is continuously changing with addition of new buildings and demolition of old ones.

The rate of addition of new buildings (and alterations/additions to existing buildings) is of the order of 1% - 2% per year. Thus a change introduced in the BCA will take at least 20 years to make a significant impact on the overall resilience of building stock.

Based on experience we can be reasonably confident new buildings constructed to the BCA can withstand current climate hazard design events, and will cope reasonably well with future events that are slightly more severe under a low emissions scenario.

The greatest concern is in relation to existing buildings constructed prior to today's contemporary building standards. These buildings are likely to be vulnerable to current climate hazard events, so would be even more vulnerable when faced with more severe future events.

If climate change associated with a high emissions scenario eventuates, current BCA compliant buildings are also likely to be at risk. Under the high emissions scenario, existing buildings would be even more exposed.

Although the BCA does not apply to impose standards on existing buildings, considering they represent the greatest proportion of building stock, a greater focus needs to be placed on how existing buildings can be made more resilient to the affects of climate change. The capacity to do this resides with the States and Territories in terms of what regulations/incentives they can put in place to have building owners retrofit existing buildings to meet contemporary BCA requirements.

#### **Recommendation 8**

*That a greater focus be placed on how existing buildings can be made more resilient to the affects of climate change.*

## **11 Australian Standards to consider the impact of climate change**

ABCB has little influence on the ability for Australian Standards to consider the impact of climate change as part of the Standards development process. It is important to note that Standards Australia is responsible for the development and revision of Australian Standards.

Although the development of Standards is outside of the control of the ABCB, the ABCB plays an active role in assisting the development and review of Australian Standards referenced in the BCA.

It is noted, however, that Standards Australia has recently been involved in developing a national standard for the resilience of infrastructure to the affects of climate change.

## **12 Conclusion**

The ABCB will continue to monitor natural disasters to determine whether current BCA provisions are appropriate, and develop new provisions as required, subject to compliance with COAG best practice regulatory principles, including cost benefit analysis and taking into account available data and research.

### 13 Attachment 1 – The BCA’s approach to natural hazards

The following is a summary of projects currently being undertaken by the ABCB relating to the adaptation and resilience of buildings against natural hazards –

- *Building in Flood-prone Areas*

Development in flood-prone areas is generally regulated by individual local governments via planning controls which either restrict the location of buildings in these areas or require the building or certain floors to be located some height above the 100 year return flood level.

The BCA does not currently include detailed construction requirements for buildings in flood-prone areas. However, a mandatory standard for the construction of residential buildings in flood-prone areas and an accompanying non-mandatory handbook are currently out for public comment and proposed for reference in BCA 2013.

- *Bushfires*

Requirements for the construction of buildings in bushfire-prone areas are included in the BCA for Class 1, 2, 3 and associated Class 10a buildings, i.e. dwellings and nearby outbuildings. The BCA references the Australian Standard, AS 3959 for construction details for buildings in bushfire-prone areas.

Following the 2009 Victorian bushfires the ABCB has been involved in a number of tasks to improve building standards in bushfire-prone areas. These tasks include –

- Ongoing review and development of AS 3959 in conjunction with Standards Australia.
- The ABCB, in response to concerns raised during the Victorian Bushfires Royal Commission that compliance may be inhibited because the relevant bushfire related standards are not readily available at low cost, will make a number of copies of AS 3959 available to the community, at no charge.
- The development of a new performance standard for the construction of private bushfire shelters.
- The commencement of work investigating the suitability of expanding the bushfire provisions of the BCA, to apply to non-residential buildings such as aged care facilities, schools and hospitals.
- The commencement of work investigating the suitability of developing a performance standard for the construction of community bushfire shelters.

- *Cyclones*

Recognising the risks that climate change poses to the built environment, the ABCB completed an investigation into possible BCA adaptation measures. While the investigation found that new buildings constructed to the BCA would be suitably resilient to future natural hazards, under low emissions case climate change scenarios, it would be appropriate to undertake further research. This research included consideration of cyclonic events, and led to the development of a Regulation Impact Statement (RIS) that reviewed the BCA requirements for buildings constructed in cyclone affected areas. This is still under consideration by the ABCB.

- *Earthquakes*

The recent earthquakes in New Zealand and Japan have highlighted the destructive power of earthquakes and the importance of building codes in risk mitigation. To ensure the BCA remains a nationally relevant document, the ABCB is evaluating whether current provisions reflect the current understanding of seismic activity in Australia. This includes a review of seismic maps referenced by the BCA, which are currently 20 years old.