



# **Building Codes in Australia**

CRRC members meeting  
Las Vegas 24 June 2010

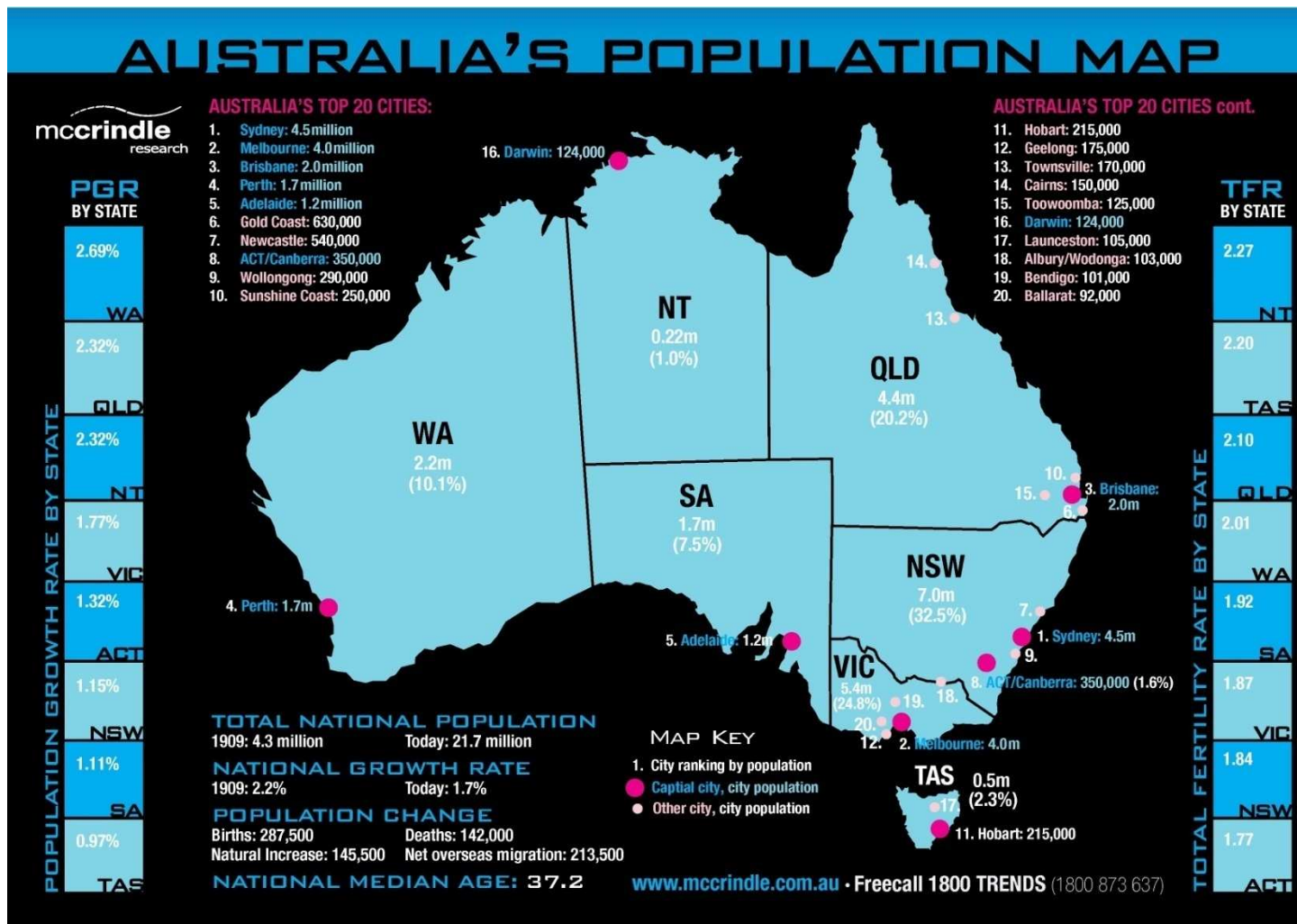


# Building Codes in Australia

---

- Regulatory framework
- Government initiatives in energy efficiency
- Construction industry response
- Roof tile industry response

# Commonwealth of Australia



## Australia's regulatory environment

---

- Australia's three levels of government play a role in development and implementation of building codes
  - Federal
  - State
  - Local
- The Building Code of Australia (BCA) is the peak regulatory document and is administered by the Australian Building Codes Board (ABCB)
- ABCB established in 1994 under an inter-governmental agreement signed by Australian, State and Territory governments

# Australian Building Codes Board

---

- Includes representatives from building industry;
- Sets minimum technical building requirements, standards and regulatory systems that are nationally consistent between States and Territories and which are cost-effective, performance-based and facilitate modern and efficient building practices;
- Ensures that the BCA is maintained and continues to meet the ABCB's objectives of health, safety, amenity and sustainability in buildings;
- Performs a regulatory "gatekeeper" role and to examine and promote opportunities to reduce regulatory burden;
- Undertakes and encourages innovative research and development within the industry to ensure a world-class performance-based building code;
- Consults with Government, industry and the community to achieve transparency in the regulation reform process;
- Simplifies the wording of the BCA requirements to achieve user-friendliness;
- Coordinates reform activities with other agencies to ensure consistency and encourage consolidation into the BCA of all mandatory requirements affecting buildings;
- Promotes national consistency in building regulations;
- Facilitates an efficient regulatory environment leading to an internationally competitive building and construction industry; and
- Undertakes education and marketing activities to increase awareness of building regulatory reform and to enhance the use of Board publications and products.

# Building Code of Australia

---

- The Building Code of Australia has been given the status of building regulations by all States and Territories.
- The BCA also calls up relevant Australian standards produced by committees representing key stakeholders such as product manufacturers, builder associations, and government departments.
- The goal of the BCA is to enable the achievement of nationally consistent, minimum necessary standards of relevant, health, safety (including structural safety and safety from fire), amenity and sustainability objectives efficiently.
- The BCA contains technical provisions for the design and construction of buildings and other structures, covering such matters as structure, fire resistance, access and egress, services and equipment, and energy efficiency as well as certain aspects of health and amenity.
- Overlaying the minimum requirements of the BCA are requirements imposed by both State Governments and Local Councils.

# Building standards, codes and regulations

---



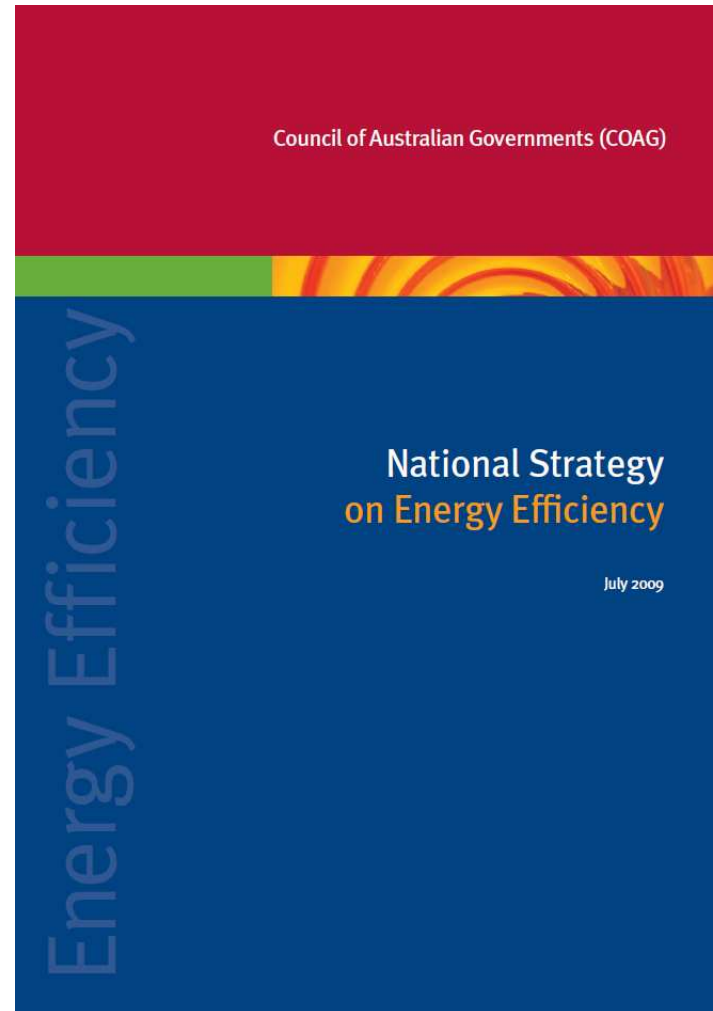
# Government initiatives

---

- In October 2008, the Council of Australian Governments (COAG) agreed to develop a National Strategy on Energy Efficiency (the Strategy) to accelerate energy efficiency efforts, streamline roles and responsibilities across levels of governments, and help households and businesses prepare for the introduction of the Carbon Pollution Reduction Scheme (the Scheme).
- A first round of stakeholder consultation was conducted in late January and early February 2009, with national workshops covering energy efficiency in the buildings sector, appliances and equipment and industry.
- Additional targeted consultations have taken place on specific measures, for example:
  - at the Energy Efficiency Opportunities (EEO) workshops during May 2009, businesses were consulted on an enhanced EEO program and on initial design factors for some of the industrial measures contained in the Strategy; and
  - proposed improvements to building energy efficiency were discussed with industry stakeholders at a forum convened by the Australian Building Codes Board (ABCB) in May 2009.
- The ABCB commenced formal consultation on proposed new energy efficiency provisions to be included in the 2010 update of the Building Code of Australia

# National Strategy on Energy Efficiency

---



## National Strategy on Energy Efficiency

---

- Historically, Australia's buildings have not been built with energy efficiency as a key concern
- Voluntary industry action, government policy requirements and building efficiency standards instituted over the past decade have begun to transform Australia's built environment.
- Energy consumption in buildings accounts for approximately 20 per cent of Australia's greenhouse gas emissions – split equally between commercial and residential buildings.

## National Strategy on Energy Efficiency

---

- New buildings will be designed and constructed according to increasingly stringent energy efficiency standards that will lead to a reduction in energy consumption.
- These standards will account for climatic variation.
- Major renovations will be subject to the same standards.
- Includes measures to help raise the energy efficiency of existing building stock through cost-effective voluntary action in response to better information about building energy use

## National Strategy on Energy Efficiency

---

- Governments will set out a clear process and timetable for periodic review.
- Industry will have greater confidence to innovate and develop affordable solutions to improve building energy efficiency.
- For example, six, seven and eight star buildings, or equivalent, will become the norm in Australia, not the exception.

# National Strategy on Energy Efficiency

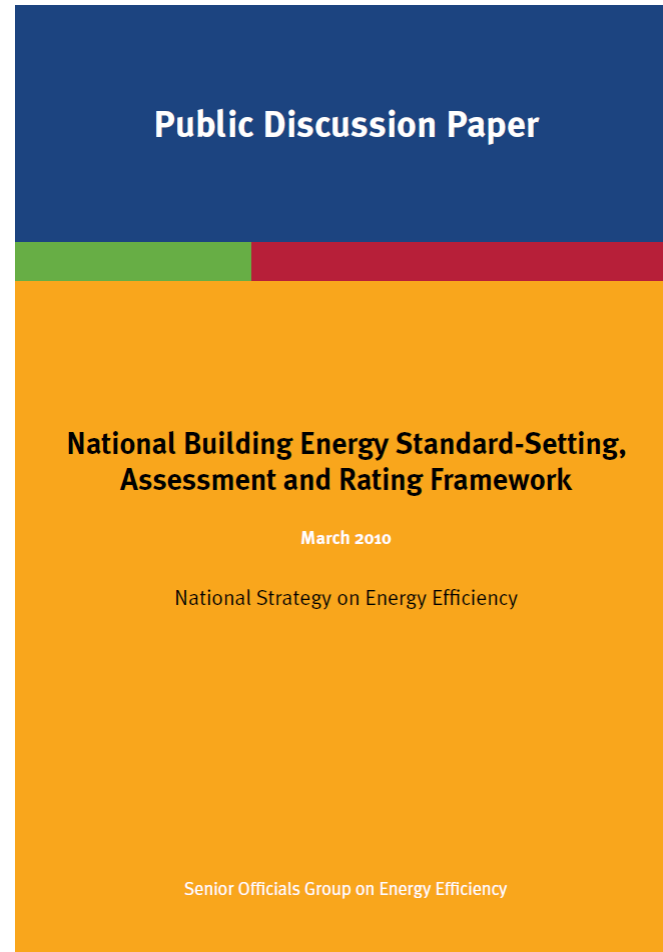
## 3.3 Residential building sector

Measure	Key elements	Indicative pathway	Implementation responsibility
<p><b>3.3.1</b> Significantly increase the stringency of energy efficiency provisions for all new residential buildings in the Building Code of Australia (BCA) and broaden coverage of efficiency requirements.</p> <p>Minimum energy efficiency standards will be upgraded to 6-stars, or equivalent, nationally in the 2010 update of the BCA – to be implemented by May 2011 and reviewed regularly for potential upgrade thereafter. For example, 3-yearly from 2012.</p> <p>Separate energy efficiency requirements for hot water systems and lighting will be also considered.</p>	<p>a. This measure will be underpinned from 2011 by new measurement and reporting metrics under the single national framework.</p> <p>b. First step is to increase minimum energy efficiency requirements in the 2010 version of the BCA, so that new buildings and major renovations must achieve a six-star rating or equivalent for thermal performance of the building shell, noting that changes are subject to regulatory impact analysis.</p> <p>c. Include in the 2010 BCA, separate new energy efficiency requirements for hot water systems and lighting, subject to a regulatory impact analysis.</p>	<p>The Australian Building Codes Board (ABCB) will be tasked with developing and implementing these new requirements, including undertaking the associated regulatory impact analysis.</p> <p>The first step in this measure will be completed when the BCA 2010 has been published, but not fully implemented until individual jurisdictions have passed their enabling regulation expected no later than May 2011.</p> <p>Subsequent increases in minimum energy efficiency requirements (star ratings or equivalent) will be considered in more detail over the course of 2009–10 through application of the framework outlined in measure 3.1.1.</p>	<p>Building Ministers Forum</p> <ul style="list-style-type: none"> <li>Responsibility for effecting the Building Code of Australia change will fall to the Australian Building Codes Board.</li> </ul> <p>In the interim, ongoing policy development will be led and managed by National Strategy on Energy Efficiency senior officials and in the longer-term delivered by its replacement body.</p>
<p><b>3.3.2</b> Phase in mandatory disclosure of residential building energy, greenhouse and water performance at the time of sale or lease, commencing with energy efficiency by May 2011.</p>	<p>a. Credible and meaningful information is publicly and readily available to market participants to assist them in making lease/purchase decisions.</p>	<p>Progress the NFE mandatory disclosure process and investigate leveraging work from the ACT Mandatory Disclosure Scheme.</p> <ul style="list-style-type: none"> <li>Stage one: Policy clarification and systems design will be completed when a decision regulatory impact analysis (RIA) is released in mid-2010. This will include an examination of the implications of different implementation options, including for landlords and tenants.</li> <li>Stage two: subject to the outcome of the RIA, which will determine scope, development and implementation will be defined in more detail over the course of 2009–10 and completed by May 2011.</li> <li>Stage three: phase-in, reviews and upgrades will commence in May 2011.</li> </ul>	<p>Ministerial Council on Energy</p> <ul style="list-style-type: none"> <li>Building Implementation Committee.</li> </ul>

[http://www.coag.gov.au/coag\\_meeting\\_outcomes/2009-07-02/docs/Energy\\_efficiency\\_measures\\_table.pdf](http://www.coag.gov.au/coag_meeting_outcomes/2009-07-02/docs/Energy_efficiency_measures_table.pdf)

# National Building Energy Standard-Setting, Assessment and Rating Framework March 2010

---



<http://www.climatechange.gov.au/government/submissions/~//media/submissions/building-energy/building-framework-discussion-paper.ashx>

# National Building Energy Standard-Setting, Assessment and Rating Framework March 2010

---

- Measure 3.1.1 of NSEE states
  - “All jurisdictions will work together to develop a consistent outcomes-based National Building Energy Standard Setting, Assessment and Rating Framework for driving significant improvement in the energy efficiency of Australia’s building stock – to be implemented in 2011.”
- The Framework has the following key dimensions:
  - development of a pathway for increasing the stringency of the energy efficiency standards for new buildings and major renovations over time;
  - alignment of measurement and reporting metrics, and assessment and rating approaches to enable the consistent application of building ratings to new and existing buildings; and
  - enhancement and co-ordination of governance arrangements for building energy assessments, ratings and standard setting.

# National Building Energy Standard-Setting, Assessment and Rating Framework March 2010

---

- In general, the Framework will:
  - be outcomes-based;
  - cover all classes of residential and commercial buildings;
  - apply to new and existing buildings (including working with mandatory disclosure policies); and
  - be capable of extension over time to cover broader sustainability elements – potentially including greenhouse gas emissions and water management.

# National Building Energy Standard-Setting, Assessment and Rating Framework March 2010

---

In relation to setting building energy efficiency standards, the Framework will:

- set increasingly stringent minimum performance standards over time for new buildings and major renovations, with standards to be reviewed and increased periodically, for example, every 3 years (subject to regulatory impact analysis);
- use the BCA as the implementation mechanism for new building work;
- cover the building envelope and energy efficiency of key building services;
- allow innovation in meeting defined performance standards;
- consider how building performance can be maintained through commissioning, operation and maintenance; and
- facilitate effective monitoring and compliance.

# National Building Energy Standard-Setting, Assessment and Rating Framework March 2010

---

- In relation to the assessment and rating of buildings, the Framework will:
  - work towards convergence of measurement based rating tools for existing buildings with predictive/modelling based rating tools for new buildings;
  - include common measurement and reporting metrics to underpin standard setting and performance assessment;
  - continue to communicate energy efficiency improvements via star ratings;
  - include flexibility to account for climatic variation;
  - accommodate mandatory disclosure of energy performance at time of sale or lease; and
  - provide for the use of rating tools developed by the market, rather than necessarily having a single tool, provided they are accurate, transparent and user friendly.

# Industry response

---

- Major building material manufacturers are represented through the Building Products Innovation Council (BPIC), a company whose members are the various industry product manufacturers associations plus a number of associated organizations.
- BPIC members represent
  - Steel
  - Gypsum Board
  - Cement
  - Concrete and Concrete Masonry
  - Insulation
  - Wood
  - Roof Tiles
  - Windows
  - Bricks
  - Housing Industry Building Surveyors
  - Building Designers
  - Energy Assessors

# Building Products Innovation Council ([www.bpic.asn.au](http://www.bpic.asn.au))

---

- BPIC's mission is to:
  - promote the efficient production and use of building products within a nationally consistent regulatory environment
  - promote environmentally sustainable practices and products in the building industry.

# BPIC submitted that key matters for the Framework to address are

---

- Delivering an improved, science-based approach, to better manage energy efficiency in buildings (new and existing) that is consistent and comparable across building products and building designs. The approach should be based on LCA methodology.
- Providing easily understood metrics (energy efficiency, greenhouse gas emissions, other environmental impacts such as water efficiency) that measure the outcomes from the contribution of materials, construction, design & end use, and considers the climatic zone of the construction and the construction economics. These performance metrics should be specifically referenced in the Framework and any future building regulations.
- The process should involve the development of a scope to investigate the development of an LCA design tool by a consortium lead by BPIC. Having produced the LCI data BPIC is well positioned to develop tools to facilitate the use of this data.
- Education, for all stakeholders that are involved in the supply chain, with emphasis on gaining an understanding of the importance of LCA methods and the use of LCA tools.
- There is a need to better understand the impact of DTS to ensure that it does not cause sub optimal default solutions to be used in preference to alternatives that offer better performance.
- The Framework should recognize the energy efficiency opportunities available in existing buildings as well as new buildings and therefore address the need for assessment of major renovations and at the various stages of property transactions.

# **BPIC fundamental position on assessment tools is Life Cycle Assessment (LCA)**

---

An LCA of a building includes environmental impacts due to:

- Extraction/harvesting of materials and fuel used for energy;
- Manufacture of building components;
- Transportation of materials and components;
- Assembly and construction;
- Operation, including energy consumption, maintenance, repair, and renovations;
- Demolition, disposal, recycling, and reuse of the building at the end of its functional or useful life.

## The BPIC LCI Project

---

- BPIC in association with the Department of Industry, Innovation, Science and Research is conducting a Life Cycle Inventory project for building materials that will be completed by November 2010.
- The project will provide a thorough inventory of the life cycle environmental impact for each major category of building products. This data and methods will enable comparison of the efficiency / impact of alternative materials and buildings.
- Importantly, as a result of this work, the Australian market will be able to rely on sound scientific assessment principles as the driver for materials selection in building decisions. At present, there is a tendency for subjective assessment, which can and does have a very direct impact on materials selection and ignores the need for consistent and rigorous science based assessment.

# The BPIC LCI Project

---

- The project has been conducted in full compliance with the relevant ISO standards. It represents a key milestone for comprehensive, science based, environmental impact analysis in Australia
  - Provides comprehensive LCI data for the major building materials
  - The data is based on uniquely Australian considerations as opposed to the use of overseas data and criteria.
  - Enables all materials and buildings to be assessed on a comparable and consistent basis – a level playing field.
  - It has demonstrated the feasibility and method of conducting LCA for building materials that will be addressed in future.
  - The information will be made available for use under a protocol that requires adherence to rigorous standards but will be freely available to all prospective users subject to their adherence to the protocol.

# The BPIC LCI Project

---

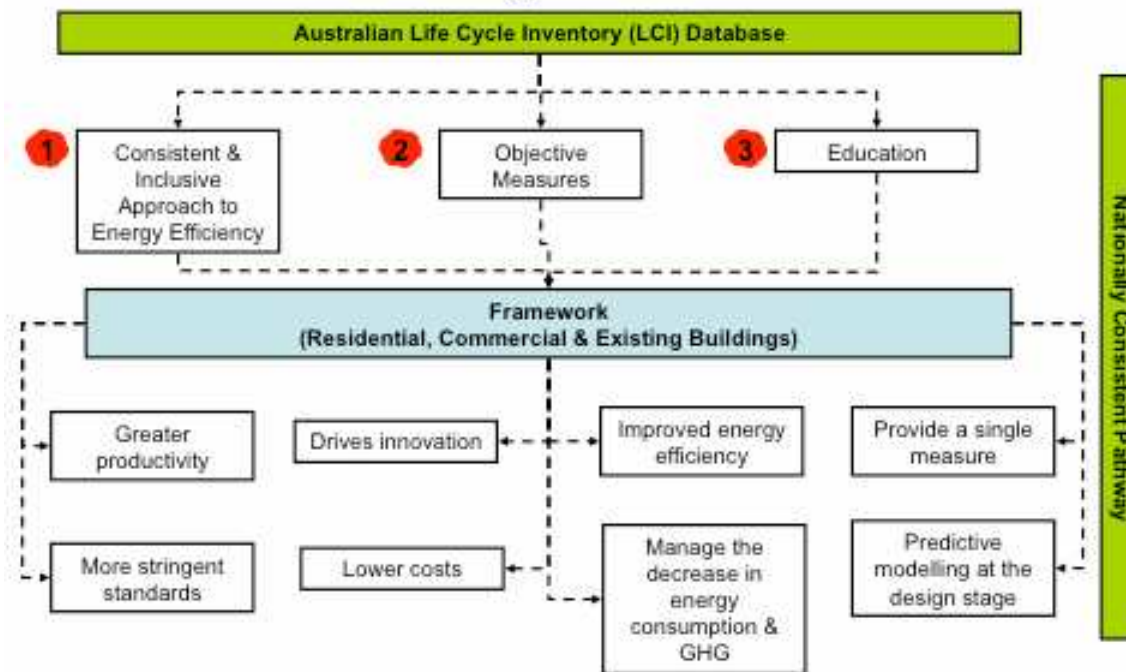
The project will deliver:

- A consistent "level playing field" methodology for use in building materials and products Life Cycle Assessments (LCA).
- An extensive database of LCI data for building materials and products all compiled in accordance with the methodology.
- A database of replacement lives for materials, products and elements of construction used in Australian buildings.
- A consistent set of 'weightings' for the relative importance of different environmental impacts adapted to the priorities of local stakeholders in different locations and climates.

# BPIC's submission



## National Building Energy Standard Setting, Assessment & Rating Framework



<http://www.bpic.asn.au/News.htm>

## House construction in Australia

---

- The majority of houses are
  - Concrete slab on ground
  - Timber wall frames
  - Brick veneer cladding
  - Prefabricated timber roof trusses
  - Timber roof battens (optional sarking/insulation)
  - Roof cover fixed directly to battens

# Building site

---



# Concrete slab on ground

---



# Timber wall frames

---



# Brick veneer cladding

---



# Brick veneer cladding

---



# Prefabricated timber roof trusses installed

---



# Bracing timber roof trusses

---



# Installation of roof tiles



# Roof tiles with sarking

---



# Roof cover complete

---



## Roofing Tile Association of Australia

---

- Formed in 2004 by amalgamation of former New South Wales and Victorian associations
- All roof tile manufacturers are members
- Roof tilers associations are associate members
- National executive made up of CEO's of members
- State divisions set up as sub committees of national executive
- State presidents have observer status at national executive observers
- Represent over 90% of those working in the roof tile industry

## Roofing Tile Association of Australia

---

- Aim is to support the roofing tile industry
- Focus on four major areas
  - Occupational Health and Safety
  - Building codes and standards
  - Training
  - Promotional
- Funded by subscription and levies on members

## Solar absorbance measures in the BCA 2010

---

- Draft BCA 2010 stated in its deemed to satisfy (DTS) provisions
  - **Clause:3.12.1.2 Roofs (a)** “(iii) have a roof upper surface solar absorbance value of not more than 0.6.”
- For roof materials outside this requirement a simulation (e.g. star rating/BASIX would be required)
- This was opposed by RTAA on the basis that
  - The imposition of a DTS requirement that roofs must have an upper surface of not more than 0.60 solar absorbance will result in the majority of new houses requiring the application of a simulation tool. Over 80% of commonly used roof products have a solar absorbance greater than 0.60. The outcome of the DTS requirement will be the imposition of some hundreds of dollars of extra cost for those home buyers who choose other than the very light colours for the roof cover of their homes.

## Of course some roofs are just “cool”

---



## And they work well for a slide night

---



**Thank you for the invitation to speak today**

---

