Consultation RIS: Energy efficiency in Class 3 buildings, Class 5-9 buildings and common areas of Class 2 buildings

Response sheet

This response sheet has been provided to assist with preparing responses to the questions contained in the Consultation Regulation Impact Statement (RIS) that analyses the impact of potential stringency changes to the energy efficiency provisions of NCC 2019 Volume One for commercial buildings (Class 3 buildings, Class 5-9 buildings and common areas of Class 2 buildings).

How to complete this response sheet

1. Provide your details, including your name, organisation and contact details.
2. For each response—
   - clearly articulate your answer to each question;
   - avoid including information that is not relevant to the question; and
   - provide data and sources of information where appropriate.
3. Submit your comment at abcbris@abcb.gov.au with the subject title “Commercial energy efficiency RIS”.
4. Comments close COB Friday 20 April 2018.

ABCB

Response sheet

Your details

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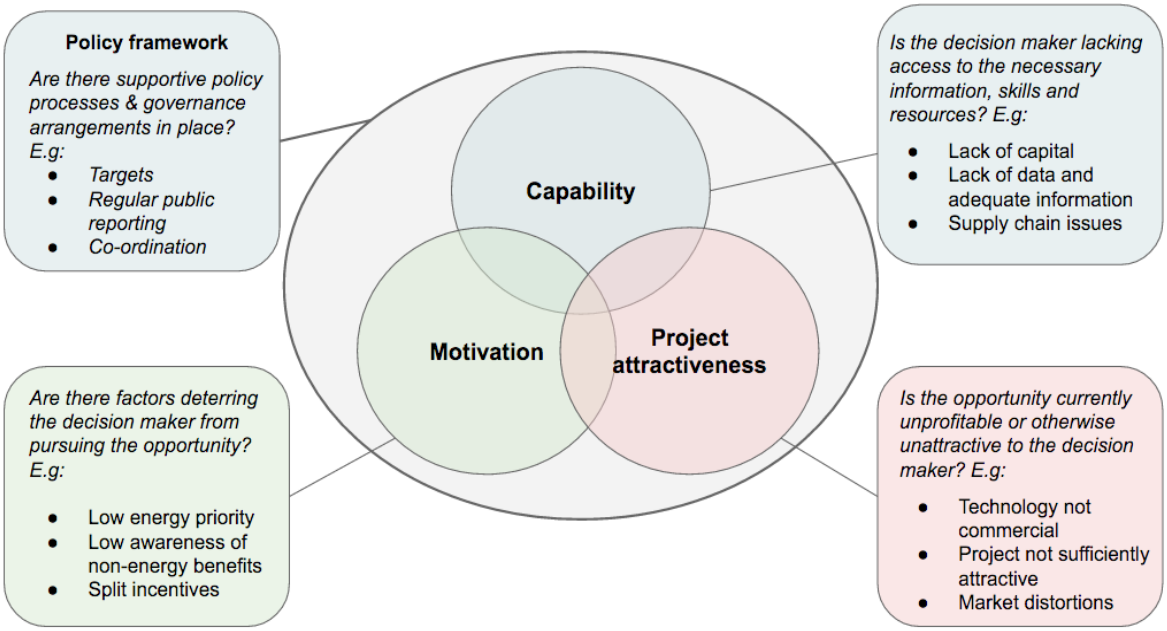
Comments

Question 1: What is your assessment of the scope of market failures in the commercial building sector that prevent the industry from investing more in energy efficiency?

Response:
Market failures in the commercial building sector are very well documented through past regulation impact assessments, industry research and government policy reviews, and are well accepted by industry experts and policy makers. These market failures are detailed extensively in the Australian Sustainable Built Environment Council (ASBEC)'s report, *Low Carbon, High Performance*, authored by ClimateWorks.

Energy efficiency and distributed energy opportunities are blocked by multiple inter-related impediments, for which there is no 'silver bullet' solution. Following an extensive literature review and consultation with industry experts, *Low Carbon, High Performance* identified four broad categories of factors inhibiting building energy efficiency from various decision makers' perspectives (occupants, owners, the building industry as well as policy makers). These are shown in Figure 1 and described below.

Figure 1: Barrier and impediment framework



Three types of impediments affect decision makers for energy efficiency opportunities in buildings (usually the building owner or tenant):

- **Capability:** The decision maker may lack (or lack access to) appropriate data and information, skills, services and products, or capital or finance, which can undermine their ability to identify or implement energy efficiency opportunities.
- **Attractiveness:** While most energy efficiency opportunities offer a financial return, some technologies (e.g. high efficiency heat pumps) may not yet be commercially attractive compared to less efficient alternatives (e.g. gas heaters). Alternatively, the financial return may exist but be less attractive than the return offered by other investments available to the decision maker. This can be amplified by market distortions such as discounted energy pricing.
- **Motivation:** Internal and external factors can have a strong influence on the motivation for a decision maker to consider implementing energy efficiency projects, regardless of financial attractiveness and capability. These include the fact that for many households and businesses, energy represents a low share of total expenditure and is therefore a low priority, or a lack of awareness of the non-energy benefits of energy efficiency, or 'split incentives' between tenants and landlords.

A further issue relates to overarching **policy processes and governance** for energy policy and regulation. A lack of good processes and governance can lead to unresolved regulatory barriers, regulatory uncertainty which can stifle investment, uncoordinated policy measures by different governments and agencies leading to suboptimal outcomes, duplicative consumer information and confusion amongst businesses and the community about the path forward. A specific issue affecting energy efficiency policy relates to the undervaluation of the benefits of energy efficiency in regulatory assessment processes.

These categories can be broken down into a range of more specific interrelated impediments that prevent decision makers from investing time, effort and resources into improving the energy efficiency of buildings. These are described in more detail below.

Detailed description of impediments

Project attractiveness

Most energy efficiency opportunities deliver a financial return over the life of the project or asset. However, in some instances, the attractiveness of an energy efficiency project or investment can be affected by:

- **Commercial viability of technologies**. While all of the energy efficiency opportunities modelled in *Low Carbon, High Performance* deliver a positive return on investment, it is important to note that there are a range of **emerging technologies** and approaches that are not yet financially attractive, and have therefore yet to become widely deployed in Australia. This barrier contributes to the early mover disadvantage, described as an aversion to the risks associated with the early adoption of technologies that may have higher costs or technical limitations associated with its relative immaturity. Some of these technologies could unlock substantial new opportunities for cost-effective energy efficiency once commercialised.
- **Low return-on-investment (ROI).** While most energy efficiency measures deliver a financial return, some projects offer a low return-on-investment compared to the returns available from other potential projects. In many cases, projects may not meet internal hurdle rates for return-on-investment.

- **Market distortions** which reduce the cost-effectiveness of the project. In many cases, discounted energy pricing is provided to large energy consumers by retailers looking to lock-in energy supply contracts, and this reduces the value of any energy savings achieved through energy efficiency. For small commercial buildings, there is often no reward provided for the lower impact that energy efficient buildings place on the electricity network - for example, lower energy prices. This may in part be resolved through the ongoing process of energy market reform, which includes a move towards more 'cost reflective' pricing (Energy Networks Association, 2015, *Electricity network transformation roadmap*), in part through a higher proportion of 'capacity charges' calculated on the basis of a customer's peak demand for electricity. Energy efficiency measures have the potential to reduce a customer's peak demand, therefore 'capacity charges' could potentially improve the business case for some energy efficiency projects. However, there is also the risk that this process could lead to a higher proportion of 'fixed charges' for electricity customers, namely a fixed daily charge imposed regardless of the customer's actual consumption, which could act as a strong disincentive for energy efficiency measures.

Capability

Some consumers do not have the capacity to identify and implement energy efficiency opportunities regardless of how attractive the latter are or how motivated they are to do so. This can result from:

- **Lack of consumer resources,** particularly for small businesses. Small businesses can struggle to meet the upfront costs of renovation, and may lack the time or capability to engage with complex and scattered information on energy efficiency opportunities. This is particularly the case in the small retail sector which is highly fragmented across many small stores (ClimateWorks Australia, 2011, *Low Carbon Growth Plan for Australia - Retail Sector Summary Report*).

- **Information failures and asymmetries** stemming from general uncertainties that are exacerbated by a lack of specialised knowledge and resources to gather information as noted above.This includes uncertainties around future energy prices (which will affect the payback on investment in energy savings), how long the current owner will occupy the building, and amenity preferences (Australian Building Codes Board/Centre for International Economics, December 2009) *Final Regulation Impact Statement for Decision (RIS 2009-7): proposal to revise the energy efficiency requirements in the Building Code of Australia for commercial buildings – classes 3 and 5 to 9*)

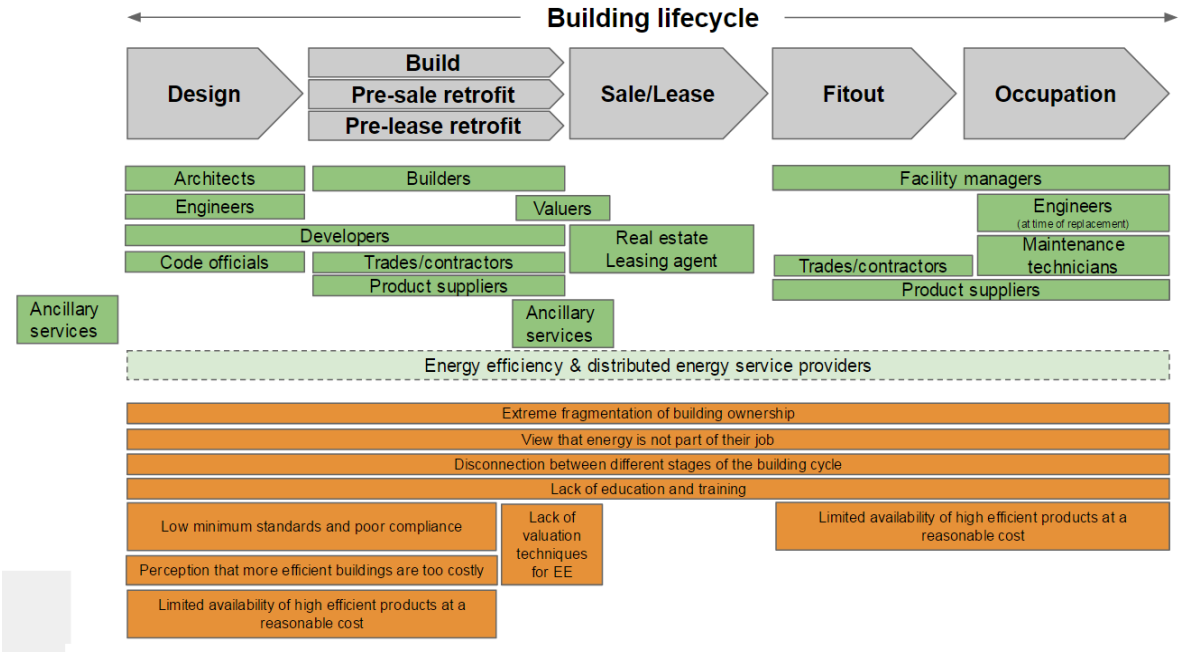
- **Lack of energy data collection and access, and user-friendly, trusted information** about buildings' energy performance and about the benefits of energy efficient buildings. Access to useable real-time energy consumption data can help enable consumers to make informed decisions about potential energy efficiency investments, but can be limited in a number of ways. The data may not be collected at all, where 'smart meters' or 'interval meters' are not installed. Where data is collected, it may not be easily accessible at low cost to consumers (pitt&sherry, 2012, *Commercial buildings baseline study*). Or, a simple, streamlined process for consumers to grant access to third parties may not be provided, limiting the extent to which innovative services can be developed and offered, particularly to smaller-scale non-residential consumers.

Beyond the data itself, there is often a lack of useable information such as appliance energy performance labels, or more often energy performance ratings for buildings, to enable purchasers to differentiate between high performing and poor performing assets. In some cases energy labels or rating schemes do not exist. More often, for the majority of building types, energy ratings are not used due to the cost or lack of consumer demand, or not disclosed to prospective purchasers (pitt&sherry, 2012). The lack of this consumer information has a flow-on effect to developers and asset owners, who may be less willing to develop efficient buildings or retrofit existing buildings if consumer-friendly information to demonstrate higher performance is non-existent or ineffective.

A lack of useable information can not only affect consumer decision making, but also inhibit the upscaling of finance, as investors do not have the means to cost-effectively evaluate the impact of their investment (UNEP Finance Initiative Property Working Group, 2014, *Commercial Real Estate - Unlocking the Retrofit Opportunity*).

- **Supply chain issues,** ranging across the building construction, renovation and maintenance industry, the equipment and appliances supply chain, real-estate and property valuers, but also ancillary services (finance-providers, accountants and lawyers), as described in **Figure 2.**

Figure 2 - Description of Building supply chain and associated barriers



Outside of the market leaders, most buildings are built to **minimum standards**. The last upgrade of the National Construction Code's minimum energy performance requirements dates back to 2010, and lags well behind best practice, with the average Green Star rated office consuming almost half the energy of a building built to minimum standards (ClimateWorks Australia, 2013, *Tracking Progress towards a low carbon economy-Buildings*). Many energy performance standards for equipment and appliances may also lag behind best practice. In addition, there is increasing evidence that **compliance** with energy performance standards during construction in particular is poor (Government of South Australia, 2015, *National Energy Efficient Building Project*) partly as a result of poor workmanship and the substitution of poor quality and cheaper products. The issue of compliance with energy efficiency requirements can in part be attributed to a lack of

verification that buildings meet standards, which encourages a sign-off culture, but also to a variety of other factors.

There are suggestions that many professionals throughout the design and construction supply chain do not have the **education and training** to be able to identify and implement energy efficiency measures, and do not regard this as a part of their job. This affects not only construction practices but also decisions made about replacement of energy intensive equipment at end-of-life (e.g. HVAC, water heaters) - often old inefficient equipment is replaced with equally inefficient new equipment, missing a crucial opportunity to upgrade at minimal marginal cost. Another area where skills are lacking is valuation, where there is currently a lack of methodologies that appropriately value energy performance and features in asset value. Finally, ancillary services (finance providers, accountants, lawyers) which can be trusted advisers to building owners or tenants often lack experience with energy efficiency projects and either advise against investment or, in the case of finance providers, may place onerous conditions on finance for energy efficiency projects because they are inexperienced in valuing these projects (UNEP Finance Initiative Property Working Group, 2014).

A related issue is the perception that more efficient buildings are too costly to construct, a perception that evidence suggests may be inaccurate. For example, CSIRO showed that building a 5-star house costs between $5,000 and $7,000 less than a lower-rated house (CSIRO, 2013, *The evaluation of the 5-star energy efficiency standard for residential buildings*). That said, experts have noted that in some cases there is limited availability of high efficiency equipment - particularly commercial equipment - at reasonable cost in Australia, due to the small size of the market combined with requirements to meet unique Australian standards and tests that impose a capital barrier to imports.

Another element that affects the uptake of energy efficiency measures is the **extreme fragmentation of building ownership.** This fragmentation creates high transaction costs and makes it difficult for the supply chain to develop viable business and delivery models for energy efficiency. Fragmentation is very high in commercial buildings, particularly in the retail sector (as noted previously), as well as in the mid-tier office sector. The latter is fragmented by extremely varied types of ownership but also by a lack of networks able to unify the segment (Green Building Council of Australia, 2015, *Mid tier commercial Office buildings in Australia*). Investors, owners and end-users in these fragmented sectors are isolated and often relatively small, which increases the burden of transaction costs associated with gathering the necessary information and assistance for them as well.

Fragmentation and disconnection within the building supply chain is another impediment to the implementation of energy efficiency. The **disconnection between different stages of the design and construction process** often results in a lack of communication between designers, builders, and operators. This lack of communication can lead to a loss of efficiency in the construction and operation stages, for example by the use, during the construction phase, of less efficient products than intended by the designer, or by an inefficient operation of the building due to a lack of understanding of its original design.

Motivation

Even if a project is fundamentally attractive in financial terms and the decision maker has access to all the information and skills required to implement it, in many cases the decision maker remains unmotivated to act. This can result from:

- **Low energy priority,** as energy is usually a very low share of total household and business costs. This is particularly the case for large energy consumers who benefit from discounted energy pricing provided by retailers, as illustrated by surveys

showing that corporate senior executives remain mostly unaware of their annual energy costs (FORBES, 2015, *No More Wasted Energy: The Power of Energy Intelligence Software*). In many cases, energy bills represent 3 per cent to 5 per cent of annual spending, and it is often unclear who is in charge of managing them. This low priority given to energy costs also results from of a focus on **competing priorities**. Most business decision makers are focused on growth of their core business, which takes precedence over managing energy costs.

- **Low awareness of non-energy benefits** of energy efficient buildings. Despite increasing evidence that energy efficiency can deliver a range of non-energy benefits - such as improved indoor environment quality, more productive staff, improved comfort and health outcomes - that may be more valuable to building owners or occupants than energy cost savings, most investors, owners and end-users are not aware of these links.

- **Split incentives,** which usually arise in buildings where the owner is in control of the opportunity and is the one required to make the investment to improve energy efficiency, but the tenant in the building is the one who receives most of the benefit of that investment in the form of an improved indoor environment and energy savings. Split incentives in buildings can be resolved if the tenant and landlord are able to reach an agreement to share the costs and benefits of the investment. However, this can involve significant effort (e.g. a lease amendment or separate contract) and can be particularly challenging where there are multiple tenants in a single building, for example in retail shopping centres or in multi-residential apartment buildings. In effect, the split incentive operates as a very strong barrier to energy efficiency in tenanted properties.

A review of the Commercial Building Disclosure Scheme by ACIL Allen in 2015 also notes a number of behavioural failures which present barriers to investment in energy efficiency, such as:

- **Computational issues** such as limited attention, decisional conflicts, over-optimism and over-confidence, self-serving bias, limited analytical capacity including bounded rationality and rule of thumb (heuristic) decision-making
- **Self-control issues** such as time inconsistency, procrastination, temptation, channelling and framing.
- **Preference issues** such as rstatus quo bias and loss aversion, outward looking or other-regarding preferences including altruism, fairness concepts and social norms.

<u>Policy processes and governance</u>

The complexity of these issues means supportive institutional frameworks are required, including robust policy processes and governance arrangements. Many industry and expert stakeholders have noted that Australia lacks a cohesive governance framework for energy efficiency. A lack of robust institutional frameworks can contribute to:

- An inability to effectively resolve policy barriers or adapt existing policies to changed circumstances without clear accountability for resolving often very complex and challenging issues
- Inconsistency in policies across different jurisdictions, increasing transaction costs
- A lack of public and industry support for and engagement with efforts to improve energy performance

One particular issue that has been raised by a number of stakeholders is the **under-valuation of the full potential benefits** of improved energy performance in policy making. Two examples of this are:

- The discount rates applied in regulatory impact assessments, which can under-value the long-term economic benefits of energy efficiency measures
- The absence of emissions reduction as an objective of the national electricity market and its regulators, the Australian Energy Market Commission, the Australian Energy Market Operator and the Australian Energy Regulator, which can undermine efforts to resolve regulatory barriers to energy efficiency and distributed energy. It is currently uncertain how the proposed emissions reduction obligation in the National Energy Guarantee will translate into decision-making.

Question 2: Is Section J of the NCC an appropriate tool to correct these market failures? Are there any other feasible options to address them?

Response:
The Green Building Council is supportive of a suite of policies which address barriers to further uptake of energy efficiency and distributed energy in the built environment. These policies, contained in ASBEC's *Low Carbon, High Performance* report, cover five themes:

- A national plan with supporting policy frameworks and governance arrangements
- **Mandatory minimum standards**, including Section J of the NCC
- Targeted incentives and programs
- Energy market reforms
- A range of supporting data, information, training and education measures

Policies must be coordinated across the above five themes as no single policy pursued in isolation will be fully effective.

Mandatory minimum standards, such as Section J of the NCC, are an essential part of this suite of policies. Low motivation to prioritise energy performance of buildings is a pervasive issue across many building owners and tenants and many service providers across the supply chain. Minimum energy performance standards can be a highly effective measure to overcome this issue by mandating improvements in energy performance in line with improvements in technology and processes. This is justifiable on the premise that consumers would choose higher performing buildings and appliances where doing so would place them in a better financial position, but are prevented from doing so by market failures such as information asymmetry and split incentives.

Regulated mandatory minimum standards are generally designed to deliver a 'minimum' level of performance, and as such are not suitable to deliver the full potential in buildings, and need to be complemented by mechanisms to incentivise performance beyond the minimum standard. Such mechanisms could include white certificate schemes, grants for building tune ups, environmental upgrade agreements, loan concessions, voluntary reporting and certification schemes, and government procurement standards. The GBCA's own voluntary certification scheme, Green Star, continues to stimulate the demand for energy efficiency by setting higher performance requirements. The program provides a good example of what can be achieved by motivated industry segments: on average, Green Star certified buildings use half as much electricity than the average Australian building and

produce 62% fewer greenhouse gas emissions (Green Building Council of Australia, 2013, *The Value of Green Star – A Decade of Environmental Benefits*)

However, if designed to incorporate a stable and predictable future trajectory, mandatory minimum standards can in themselves support these other mechanisms by sending a signal that regulation will be tightened in the future. This incentivises consumers and suppliers to prepare and innovate to develop solutions ahead of the tightened standards.

A range of other research echoes the importance of mandatory minimum standards as part of a holistic suite of policies, both in Australia (e.g. Harrington & Toller, 2017, *Best Practice Policy and Regulation for Low Carbon Outcomes in the Built Environment*; Department of Climate Change and Energy Efficiency, 2010, *Report of the Prime Minister's Task Group on Energy Efficiency*) and internationally (e.g. Global Buildings Performance Network, 2013, *A Comparative Analysis of Building Energy Efficiency Policies for New Buildings*; International Energy Agency, 2013, *Modernising Building Energy Codes to Secure our Global Energy Future*

Question 3: It is suggested that there might be regulatory failures in the NCC's current methodology, for example an emphasis on window U-Value for certain types of buildings that might be leading to higher energy use and construction cost.

a) Do you agree this is a problem?
b) If you agree it is a problem, are there any feasible options to address the problem?

Response:

N/A

Question 4:
Are there any other problems not considered by this Consultation RIS?

a) If so, are there any other feasible options in addressing these problems?

Response:

The GBCA have observed regulatory issues relating to a lack of certainty in relation to if, when, by how much and according to what criteria the energy requirements will be updated each time the NCC is reviewed and updated. The proposed changes for the NCC 2019 represent a significant increase on the current performance requirements for commercial buildings and will require industry practitioners to change and adapt their practices to new requirements. While the changes are welcomed by the GBCA and we acknowledge the ABCB's demonstrated commitment to consultation, we note that an improvement on the current approach of ad-hoc amendments would be long-term planning for energy performance targets in the NCC. These targets should be aligned with Australia's commitments under the Paris Agreement on climate change and a forward trajectory for the Code energy requirements to achieve these targets. The targets and trajectory need to be complemented by rules and processes that would support the efficient implementation of continually strengthening energy requirements.

Supporting governments in answering these questions is the primary objective of the Building Code Energy Performance Trajectory Project, a partnership between ASBEC and ClimateWorks Australia supported by the GBCA. The project will develop an industry-led

evidence base to support governments and industry to adopt ambitious long-term targets and forward trajectories for progressive increases in stringency for the Code energy requirements.

Question 5: Of the two options proposed, which one is your preferred option? Please provide your reasons and any evidence for your preferred option?

Response:
There are 3 options presented in the RIS:
1. The status quo
2. The proposed amendments to Section J of the NCC
3. Collating the work undertaken by the ABCB in developing the amendments to the NCC into a handbook for adoption by industry on a voluntary basis.

The Green Building Council supports the proposed changes to Section J of the NCC. Our preferred option is Option 2.

Based on the market failures outlined in responses to questions 1-2 and the critical importance of improved energy efficiency and energy performance of buildings for achieving emissions and energy goals, we support any amendments to Section J that will deliver energy and emissions reductions in new buildings and major renovations while delivering a benefit-cost ratio of between 1 and 1.5 as per the current methodology for regulatory anlaysis.

The Consultation RIS demonstrates that when measures are combined and aggregated to a national level, the benefit cost ratio ranges between 6.1 for the low realisation scenario up to 12.4 for the high realisation scenario; significantly higher than the 1-1.5 range targeted by the analysis. This suggests that the measures, when combined, can realise greater benefits than when the measures are considered in isolation, and that there are significantly more opportunities to increase the stringency of the commercial energy requirements cost-effectively than proposed for NCC 2019. The Building Code Energy Performance Trajectory Project will address this by optimising the models when measures are combined to ensure that the resulting benefit cost ratios are still within the 1-1.5 range; this approach needs to be considered in reviewing the NCC 2019 proposal and in developing provisions for NCC 2022 and beyond.

As technology and electricity prices change over time, further cost-effective opportunities are expected to be unlocked in addition to the proposals for the NCC 2019. Some of these additional opportunities will be set out in a final report by the Building Code Energy Performance Trajectory Project, due for publication in June 2018, with additional opportunities expected to emerge over time.

The importance of helping industry practitioners understand these changes should not be overlooked and on this front the GBCA urges the ABCB to provide dedicated education and training to promote greater awareness of the changes, and how industry can deliver compliant solutions. This can be achieved with supporting materials covering key concepts and case studies, as well as training courses to provide guidance on to how to apply the provisions.

Considering the significant changes proposed for Volume 1 of the NCC 2019, it will be important to ensure that industry is ready and equipped to adapt and comply with the new requirements. We note that the final decision on the proposed changes will be made in

November of this year, which provides very little time for industry practioners throughout the supply chain to prepare themselves before the changes come into effect in 2019. As such, we urge the ABCB to consider introducing a transition period for industry to adapt to the new requirements for the NCC 2019 as well as subsequent updates.

Question 6:

Response:

N/A

Question 7: How will building designs most likely respond to the proposed changes:

a. Maintaining preffered WWR supplementing window performance through shading?;
b. Reducing WWR to a minimum practical level?; or
c. Adopting a different compliance pathway?

Response:

N/A

Question 8: What scenario for energy saving (low, medium or high) in your view is most likely and what factors will affect the realisation of modelled results?

Response:

N/A

Question 9: Do you agree that SHGCxWWR is the dominant factor over U-Value in determining final energy consumption and construction cost?

a. Is it a new finding?
b. Are you aware of any overseas examples recognising the importance of SHGCxWWR?

Response:

N/A

Question 10: Has the Australian industry acknowledged the importance of SHGCxWWR and adopted an approach which can reduce energy consumption with lower construction cost? If not, what prevents the industry from doing so?

Response:

N/A

Question 11: Energy modelling and the RIS analysis suggests that a key proposition (lower energy consumption and lower construction cost through lower SHGCxWWR) could be affected by the underlying cost relationship, and we seek your views on the following issues to better inform the cost benefit analysis:

a. To what degree will the assumed window and insulation pricing affect the results; that is turn a negative cost change into a positive one?
b. The Energy Action window database suggests the market does not place a high value on an important performance measure (that is SHGC) of a window.
   i) What is the reason for this?
   ii) Is this consistent with your experience?
c. Are there any other factors that could change the results?

Response:

N/A

Question 12: In your opinion will an increase in the stringency of the energy efficiency requirements impact on the NCC's other goals below, and if so how:

a. Safety (including safety from fire) and health?
b. Amenity?
c. Accessibility?

Response:

Increases in the stringency of the energy efficiency requirements could impact on the NCC's other goals if not properly implemented. Energy efficiency can be implemented without impacts on these other goals, however some operators are not equipped with the appropriate knowledge or skills. There is a role for government to (1) support improved capability within industry including by providing or supporting the provision of training and information and by considering certification of key professionals, including building surveyors; and (2) improved monitoring and enforcement. There is also potential to include provisions in relevant sections of the Code (e.g. relating to safety) to mitigate the risk of unintended consequences.