27 April 2017

Climate Change Policies Review - Discussion Paper submissions
2017 Review Branch
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To Whom It May Concern

**SUBMISSION: AUSTRALIAN GOVERNMENT REVIEW OF CLIMATE CHANGE POLICIES**

The Australian Sustainable Built Environment Council (ASBEC) welcomes the Government’s 2017 *Review of Climate Change Policies*. We congratulate the Government on its commitment to address climate change and we encourage a suite of effective policies, science-based targets, and careful management in reducing carbon emissions.

ASBEC is a body of peak organisations committed to a sustainable built environment in Australia, with membership consisting of industry and professional associations, non-government organisations and government observers who are involved in the planning, design, delivery and operation of our built environment.

Buildings are a major energy consumer and account for almost a quarter of total Australian emissions. The built environment provides a great opportunity in terms of implementing innovative low/zero carbon technology. *Low Carbon, High Performance*, authored for ASBEC by ClimateWorks Australia, outlines a clear policy roadmap for realising this opportunity.

Achieving a reduction in carbon emissions in the built environment and other high emitting sectors, however, requires a step-change approach through strong policies that will ensure alignment and coordination of regulatory frameworks at the Federal and State/Territory level to Australia’s Paris Commitment.

Dr Alan Finkel’s triple bottom line ‘trilemma’ of energy security, affordability and reduced emissions, as outlined in the *Preliminary Report: Independent Review into the Future Security of the National Electricity Market* is particularly applicable in the built environment context as we search for ways to optimise energy productivity through the provision of high performance buildings.

ASBEC has identified five key policy solutions which could support a transition to high performance buildings:

1. Establish national plan towards zero carbon buildings by 2050
2. Set strong mandatory minimum standards for energy performance of buildings and appliances
3. Create targeted incentives and programs
4. Reform the energy market to remove market distortions that undermine the business case for energy efficiency and distributed generation
5. Resource enabling energy data, information, research and education measures

Each of these policy solutions – together with progress in the areas of ASBEC’s key priorities: resilience, cities and infrastructure – should be core considerations in achieving a low carbon high performance built environment, and will provide a strong platform to help address future challenges as all stakeholders work together to achieve Australia’s carbon reduction commitments.

Our responses to the questions contained in the *Review of Climate Change Policies* discussion paper are provided in this submission, and are informed by the findings in ASBEC’s *Low Carbon, High Performance, Built Environment Adaptation Framework* and *Investing in Cities*. A detailed list of *Low Carbon, High Performance* recommendations is available in *Appendix A*. 
Built Environment Opportunities to Reduce Carbon Emissions

Australia’s built environment provides an enormous and cost-effective emissions reduction opportunity. Buildings account for 23% of Australia’s emission and the built environment provides some of the most affordable forms of greenhouse gas abatement in the economy.

*Low Carbon, High Performance* shows that improvements in building energy performance over the past decade have decoupled energy consumption from growth, and saved over 186 MtCO2e and $28 billion (gross) in avoided energy bills.

However, overall energy intensity across the sector has only slightly improved (2% across the commercial sector, and 5% in the residential sector), indicating that the achievements of market leaders in the sector have not yet spread to the majority of buildings. This is presently a missed opportunity.

Modelling by ASBEC and ClimateWorks Australia shows that cost effective energy efficiency and fuel switching, both low hanging fruit in terms of achieving emissions reductions, can reduce projected 2050 emissions in buildings by more than half.

In addition, by implementing all of the energy efficiency opportunities outlined in *Low Carbon, High Performance*, almost $20 billion in financial savings by 2030 can be achieved, as well as the realisation of productivity benefits and improvements in quality of life for Australian businesses and households.

Buildings could also meet over half of the national energy productivity target, and more than one quarter of the national emissions target.

**Question:** What are the opportunities and challenges of reducing emissions for households, SMEs and the built environment? Are there any implications for policy?

As mentioned above, *Low Carbon, High Performance* found that, by 2030, the energy savings from energy efficiency and fuel switching improvements could deliver cumulative net financial savings of almost $20 billion to households, businesses and government entities.

Australian property companies are global leaders in setting green building benchmarks for world leading sustainable buildings. These buildings are generally represented in newer building stock, however, the majority of new and existing Australian buildings lag behind. As an example, Green Star rated office buildings emit less than half the level of greenhouse gas emissions than the average 10-year-old building.

This provides a compelling argument for providing a regulatory framework to ensure higher minimum energy performance standards for new buildings and incentivised energy efficiency measures for existing buildings.

Improving the energy efficiency of Australia’s building stock also has the effect of reducing the need for additional infrastructure to cope with peak energy demand.

**Towards Zero Carbon Buildings**

The technology already exists to achieve zero carbon buildings, so there is a real ability to take full advantage of these opportunities right now.

Zero carbon buildings can be achieved through:

1. **Energy efficiency:** Improvements in the efficiency of appliances and equipment, and improvements to the thermal efficiency of the ‘shell’ or ‘envelope’ of the building.
2. **Fuel switching:** Switching appliances and equipment that use gas, wood or other fuels to electric alternatives.
3. **Zero emissions electricity:** Deployment of zero emissions electricity, including:
   a. **Onsite:** Installation by building owners of on-site distributed energy systems such as solar PV and, increasingly, battery storage systems;
   b. **Offsite:** Purchase by building owners or occupants of off-site low carbon electricity, for example through a power purchase agreement or through GreenPower;
   c. **Grid:** Decarbonisation of the electricity grid through replacement of fossil fuel power stations with large-scale centralised renewable energy.
Even without new technological breakthroughs, simply selecting options (1) energy efficiency and (2) fuel switching, can reduce emissions from buildings by more than half.

Adopting energy efficiency actions in this sector alone could deliver a **23% reduction in emissions by 2030**, and **55% reduction in emissions by 2050**.

However, longer term planning for a zero net emissions future beyond 2030 must also involve consideration of decarbonisation of the grid through replacement of fossil fuels with large scale renewable energy.

*Innovations in the built environment – Case Studies*

Across all building types, there are many examples of both new and existing buildings which have achieved very high energy performance and very low or ‘positive’ emissions.

**Case Study 1: The first zero net emissions office building in Australia**

In 2010 Grocon completed the Pixel building, located in Carlton, Melbourne. Features of the building include high efficiency lighting with daylight control and solar PV and wind turbines, which generate more electricity than is required by the building. A new structural concrete was developed for the building, which has significantly reduced embodied carbon. A large proportion of the building envelope can be removed and re-used in order to reduce the future footprint of the building when it is demolished.


**Case Study 2: First Australian property fund B Corp demonstrates the power of sustainable returns**

Impact Investment Group (IIG) is a leading Australian impact investment funds manager and Australia’s first funds manager to obtain B Corporation certification. IIG’s vision is to advance a new model of business that intentionally promotes economic, social and environmental prosperity. IIG sources and develops investments that generate social and environmental value throughout the investment’s life, as well as delivering strong financial returns for investors.

IIG is already delivering on this goal. In 2015 it increased property assets under management by 64 per cent, launched two new funds and has almost 100 per cent occupancy across its real estate portfolio. The company has recorded impressive sustainability achievements, including:

- Achieving net zero grid electricity consumption for its Byron Bay Quicksilver property by focusing on operational efficiency and sustainable procurement / operation of rooftop solar installation;
- Committing to install a 230 MWh/yr solar system and Tesla storage batteries at its Dream Factory startup hub in Footscray, Melbourne and upgrading the property’s energy rating from an estimated zero to 6 Star NABERS rating;
- Committing to become zero net emissions across its portfolio (off-set by wind and solar assets), obtain Green Star - Performance certifications across the portfolio, deploy on-site rooftop solar and green roof/urban farming installations across its portfolio where feasible and invest further in renewable energy.


**Case Study 3: 160kW solar array produces more power than the building uses**

The Sustainable Buildings Research Centre at the University of Wollongong New South Wales is a 6 Star Green Star - Education Certified rated building, which produces 62 per cent fewer greenhouse gas emissions and uses 51 per cent less water than the average Australian building. The design and build focused on technological capability and financial viability. Electrical Engineer for the project, Dr Duane Robinson, said "There are a number of systems that don't require a lot of expense, like insulation...for a couple of thousand dollars you can achieve some large savings in your energy bill."

Features include natural ventilation, indoor environmental quality features and extensive monitoring and building control systems for operating efficiency. It is built from locally sourced materials, which contribute to the regional economy.

For more information visit: [sbrc.uow.edu.au](http://sbrc.uow.edu.au)

**Case Study 4: The greenest public building in Western Australia**

The Green Skills Training Centre at Perth's Central Institute of Technology is a 6 Star Green Star - Education certified vocational education and training building. The $17 million centre is used by CIT students studying sustainable building and construction, it aims to show student’s best practice sustainability measures including best available technology and construction methodology.

A 50 inch LED TV screen provides continuous data on the building’s energy and environmental status. The building operates at net zero energy as the building’s solar power is generated both by roof panels mounted on sawtooth roofing, and facade-integrated panels. The system has been designed to have the capacity to generate all the energy needs of the centre, making it feasible for it to operate off-grid. The building includes an ISO 14001 certified steel frame that can be taken apart and reused at the end of the building’s life, and timber used is sourced from forest certification schemes or re-used.

For more information visit: [central.wa.edu.au](http://central.wa.edu.au)
### Case Study 5: Over 6 per cent productivity increase, equal to $300,000 per year in salary costs

Australian Ethical Investment used accepted conventional and low-technology design principles to retrofit Trevor Pearcey House in the ACT. Warren Overton who was, at the time, Managing Director of the company that performed sustainability services, said “Trevor Pearcey House showed that exemplar environmental performance can be achieved on a conventional budget.” A 6 Star Green Star rating was achieved.

Energy use has reduced by 52 per cent compared to pre-retrofit, saving approximately $20,000 per year. The bulk of the reduction was achieved through double-glazed windows, lighting upgrades, and new insulation.

An internal survey of staff perceptions found they felt healthier and more comfortable in the building, and have reported a 6.2 per cent increase in productivity. The company estimates this productivity improvement adds up to a benefit of around $1.5 million of extra value over five years.


### Case Study 6: Reduction in energy usage has been seen annual energy cost saving of almost $233,000 for tenants

Mirvac and Investa’s retrofit of 10-20 Bond Street, Sydney, saw the building achieve a 4 star Green Star rating and a 5 star NABERS Energy rating. Measures such as upgrading lifts, updating air conditioning and installing a tri-generation plant, significantly reduced demand for heating and cooling while supplying low-carbon electricity.

Improving energy efficiency and using electricity from low carbon sources reduced base building electricity consumption by 766,117 KWh, resulting in annual energy savings of more than 60 per cent.

From financial year 2013 to 2015 there was a 37 per cent reduction in carbon emission intensity, equating to reduced carbon emissions of 1,138 tons CO₂, this was achieved through energy efficiency and cogeneration. This resulted in Mirvac exceeding its company carbon intensity target three years ahead of schedule.

For more information visit: [office.mirvac.com/office/10-20-bond-street,-sydney/](http://office.mirvac.com/office/10-20-bond-street,-sydney/)

### Case Study 7: Lochiel Park Green Village

Lochiel Park is arguably Australia’s most environmentally sustainable high performance residential estate. Started in 2005 from a vision to create the nation’s model green village, Lochiel Park has been a showcase of environmentally sustainable technologies and practices which has proven the viability of low carbon living. This living laboratory located in suburban Adelaide, comprising 100 dwellings, has helped create a detailed understanding of low carbon homes and their impact, informing sustainable housing decisions nationally and throughout the world.

Through a detailed monitoring program since the estate’s inception, the University of South Australia has documented key social, economic and environmental impacts. The Lochiel Park resident’s value improved thermal comfort and wellbeing as well as the associated economic and environmental impacts. Living in a minimum 7.5 star homes with high efficiency appliances, equipment, smart controls and displays and roof top solar electricity and hot water has enabled over 60 per cent reduction in energy consumption and associated greenhouse gas emissions in comparison with the Australian average with substantial cost savings. Associate research has demonstrated a positive economic value proposition and documented the impact and learnings for industry and policy implications.


### Case Study 8: Affordable blueprint for retrofitting existing homes

The University of Wollongong and TAFE Illawarra Institute (Team UOW Australia) have developed the Illawarra Flame House to show how a typical Australian ‘fibro’ home can be retrofitted to become zero net emissions. The project aimed to provide an affordable and achievable development and adoption of advanced building energy technology in new and existing homes.

Features of the Illawarra Flame House include 9.4KW PV system, natural ventilation and extensive insulation. Building material was selected for low embodied energy and local production. A line for non-essential appliances and equipment was added allowing all standby items to be switched off at one point.

The design beat 20 finalists to win the 2013 Solar Decathlon in Datong, China. Students were required to build and operate a house that is advanced, appealing, energy efficient and cost effective. The team finished with a score of 957.6 out of a possible 1000 points as well as receiving first place awards in categories such as engineering, architecture and solar application.


### Case Study 9: Turning shopping centres into power stations

In 2015, Stockland installed one of the largest single rooftop solar PV system in Australia at the Shellharbour Shopping Centre. Stockland set a 1.35 MW renewable energy target for their retail portfolio, equivalent to 321 average residential systems. Between Shellharbour (1.22MW) and three smaller projects, Stockland has reached 1.36 MW of renewable energy and achieved its renewable energy target. This project achieved a 4 Star Green Star - Retail certification.

Before building they completed technical and financial feasibility assessments, which determined that the best return on investment from solar PV is achieved through creating a new business model. The model involves Stockland selling electricity directly to retail businesses in their centre. The success of this model is achieved by selling most of the electricity to retailers in the centre at a reasonable price and avoiding exporting electricity to the grid, which returns a lower price.

The system generates on average 4,789 kWh per day, the equivalent of more than a quarter of the centre’s daily base building power requirements. The system will offset 1,700 tonnes of CO₂ annually.

The cost of the system was $2.1 million and payback is estimated to be seven years.

For more information please visit: [shoppingcentres.stockland.com.au](http://shoppingcentres.stockland.com.au)
Case Study 10: Panels in the sky

101 Collins owners and management team have a strong focus on sustainability, looking to continually improve on their 4 star NABERS building rating for energy. Following a tenant sustainability survey carried out in 2008 a number of energy efficiency initiatives were undertaken, including extensive energy efficiency lighting upgrades and replacement of the primary heating and cooling chillers.

In 2015, a study into solar PV viability resulted in the installation of a 59.4kW system made up of 180 vertically oriented solar panels, positioned 191 metres above street level. At a cost of $230,000, the system will produce around 47,000 kilowatt hours of energy each year (equal to the annual energy use of about 12 homes), and avoid 59 tonnes of CO₂ annually. Since 2008, base building energy use at 101 Collins Street has reduced by 44 per cent. The solar system is expected to produce annual energy savings of $7,000 per annum.


Emerging Technologies

The table below outlines further emerging but market-ready and cost-effective efficiency measures that could result in substantial future energy savings.

<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>DESCRIPTION</th>
<th>KEY FACTS</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-cost sensors</td>
<td>Monitoring, controlling, optimising lighting and heating and cooling systems and fault detection.</td>
<td>Could reduce building energy consumption by 20-30%.</td>
<td>Costs reducing rapidly, US Department of Energy working on $1-10 prototype.</td>
</tr>
<tr>
<td>Building-integrated Photovoltaics</td>
<td>PV modules integrate directly into a building, in place of ordinary building materials.</td>
<td>Improves climate performance and reduces operational cost and embodied energy.</td>
<td>Not yet price-competitive on the retail scale with conventional panels.</td>
</tr>
<tr>
<td>Smart thermometers</td>
<td>Control residential heating and cooling systems and can sense, communicate and respond automatically.</td>
<td>React to price signals to change temperature set points, or to cycle heating and cooling to reduce peak demand.</td>
<td>New technology, already some evidence showing they reduce home energy use.</td>
</tr>
<tr>
<td>Geothermal heating and cooling</td>
<td>Natural heat from shallow earth is transferred into building, reverse process cools.</td>
<td>Can reduce annual household energy expenditure by 75%.</td>
<td>Rebate schemes exist in the US, Canada and UK. Gaining interest in Australia.</td>
</tr>
<tr>
<td>Smart glass (SageGlass®)</td>
<td>Can switch between clear and tinted glass using a small electric charge, depending on heat and light conditions.</td>
<td>Takes advantage of natural light, which can reduce a building's energy consumption, enabling cost savings.</td>
<td>US Department of Energy provided $72 million loan guarantee to support construction and operation.</td>
</tr>
<tr>
<td>Real-time feedback on energy use</td>
<td>Technologies provide customers and utilities real-time data on electricity use.</td>
<td>Energy savings result from greater understanding and control of energy use.</td>
<td>Being deployed at a large scale. Primary drivers are improved reliability and control.</td>
</tr>
<tr>
<td>Prefabrication</td>
<td>Off-site factory construction of building elements.</td>
<td>Reduced costs and construction time, high level of customisation.</td>
<td>Widely used in Europe, gaining interest in Australia.</td>
</tr>
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</table>

Facilitation and support for distinct market segments

The breadth and diversity of the built environment sector is a major challenge for policy development. Government can tackle this issue by developing targeted approaches for particular market segments.

Priority segments include:

- Market leaders: Consider the establishment of leadership groups in retail, health and industrial sectors, to support innovation, develop collaborative solutions to common industry barriers and encourage mainstreaming of best practices.
- Mid-tier building owners: Resource the implementation of the Mid-tier National Pathway actions including the Building Retrofit Toolkit development and deployment, and support the industry led development of an energy efficiency pathway for the mid-tier retail sector.
- Low income and vulnerable households: Develop end-to-end support programs for low income households, building on the lessons learned from the Low Income Energy Efficiency Program.
Emissions Reduction Fund

While the Emissions Reduction Fund (ERF) aims to target least-cost emissions reductions, structural barriers have prevented uptake in buildings, where many of the lowest cost opportunities exist. Of the hundreds of contracts awarded in the five ERF auctions, only four projects used the commercial buildings method. None of those are core building sector representatives.

The ERF in its current form is unsuited to incentivising emissions reductions in buildings. It is critical that this climate change policy review identifies and addresses barriers to participation for buildings. This Review should include consideration of whether a portion of the ERF funds should be redirected to other incentives or programs better suited to buildings.

Industry experts cite the following as reasons for the ERF’s failure to attract bids from the buildings sector:

- a barrier to entry presented by minimum bid sizes of 2,000 tonnes of annual emissions savings
- a requirement for multi-year contracts to be signed, which can create a risk that if savings do not eventuate, the building owner may be financially liable,
- a combination of relatively high transaction costs to prepare and aggregate bids, alongside uncertainty about the price that will be received, and an expectation that the price maybe be relatively low compared to the other potential benefits of a project.

If the objective of the ERF is to provide financial incentives for least-cost emissions reductions, these issues need to be resolved by adjusting the design of the ERF. These could include:

- reducing the minimum bid size for buildings
- allowing partial opt-outs for building owners if expected emissions savings are not delivered in a particular year,
- establishing separate auction streams for buildings to reduce uncertainty about the likely price.

Timeline for Policy Solution roll-out

Low Carbon, High Performance outlines a five year implementation timeline to facilitate the uptake of ASBEC’s policy solutions. There is notable progress in some activities, including the measures in the National Energy Productivity Plan; a review of Commonwealth Government procurement practices; updating of the energy efficiency provisions for commercial buildings in the National Construction Code, and the development of a forward trajectory for minimum standards (led by ASBEC and ClimateWorks).

Figure 1. Five year implementation timeline

- Develop zero emission buildings plan with targets
- Influence development of NEPP measures
- Design new targeted incentives and other measures (e.g. green depreciation)
- Immediate implementation of ready policy mechanisms (e.g. government asset upgrade programs, sectoral pathways)
- Design National Construction Code upgrade
- Establish a forward trajectory for minimum standards
- Develop new measures
- Establish National Energy Efficiency Authority
- First report on progress towards targets
- National Construction Code upgrade
- Second report on progress of national plan
- NEPP review and third report on progress towards targets
- Introduce stronger measures if required (e.g. minimum standards for existing buildings)

The Cost of Delay

Delay in overcoming obstacles to improved energy performance risks locking in high levels of emissions and poor energy performance for decades to come. Just five years delay would lead to $24 billion in lost energy savings for households and businesses to 2030 and the cumulative loss of 176 MtCO2e reduction opportunities. A further five years of delay would lead to the loss of an additional 221 MtCO2e (bringing the total loss to 397 MtCO2e) of emissions reductions.
Question: How can energy and climate policy be better integrated, including the impact of state-based policies on achieving an effective national approach?

Balanced policy framework

Supply and demand must be recognised as two sides of the same story within the energy and climate policy framework. A better balance of supply and demand-based policies will allow for more flexible, adaptable and future-proof energy systems that are not overly-reliant on one-way transmission via the grid. Additionally, renewables and energy efficiency policy must be integrated, to ensure an appropriate transition to a low-carbon future.

The current energy system dialogue focuses heavily on supply-side technologies (including onsite generation and energy storage). Demand-based strategies such as smart energy use offer the fastest and cheapest ways to cut energy bills and reduce emissions, as well as reduce the burden on Australia’s energy infrastructure.

Prioritise energy efficiency and built environment

To support this effort, the Australian Government should establish a National Plan Towards 2050 Zero Carbon Buildings, with supportive governance arrangements, including:

- targets for emissions and energy in the built environment;
- coordination of activity across levels of government and government entities;
- regular public reporting of progress;
- public and industry engagement;
- coordination and planning of research, education and training; and
- clear responsibility for implementation, review and updating over time.

The establishment of an independent Energy Efficiency Authority should be investigated. Such an Authority could coordinate energy efficiency policy development and implementation, and evaluation and reporting of the effectiveness of energy efficiency policies. This would provide greater regulatory certainty and stability in the context of impacts, influences and limitations of new demand-side technologies on the energy system.

Empower Consumers

The built environment should not be overlooked in terms of its potential to inform and empower consumers in the energy market.

The processes through which electricity tariffs, ‘feed-in tariffs’ for exported electricity and costs of connection to the electricity grid and retailer licensing requirements are set are extremely complex, limiting the ability of non-technical experts (including built environment stakeholders) to participate and effectively prioritise consumer interests.

There is a largely untapped opportunity to improve energy efficiency – through higher minimum standards for buildings, bettering the way energy performance of our buildings is disclosed, and targeted incentives – resulting in energy cost savings for households and businesses, improved energy productivity, emissions reduction, more efficient use of energy infrastructure through reduced demand from new buildings, and improved health and comfort for building occupants.

As mentioned above, just five years of delay in implementing opportunities for high performance buildings could lead to over $24 billion in wasted energy costs and over 170 megatonnes of lost emission reduction opportunities through lock-in of emissions intensive assets and equipment.

Independent Ombudsman

An independent ombudsman or other independent authority should be established to investigate and recommend solutions to address energy market barriers, and allow consumers to more easily voice their concerns in the context of energy market processes and reforms. This authority should help to ensure that these processes support and do not disincentivise cost-effective uptake of energy efficiency and distributed energy.
Minimum standards and a trajectory for increased stringency for building energy provisions

The National Construction Code – which sets the minimum necessary requirements for new buildings and new building work in existing buildings – is updated every three years. The minimum energy performance standards are not necessary adjusted at these points. In fact the energy provisions in the Code have not been updated since 2010.

The next update is due in 2019. Stringency for energy performance will only be reviewed for commercial buildings in the 2019 Code, meaning that residential buildings will likely wait for at least 12 years before a stringency review is undertaken. Minimum standards for Australia’s buildings currently lag far behind best practice, and need to be updated urgently.

Additionally, a trajectory should be established for future upgrades of the energy provisions in the Code, providing a clear opportunity to catalyse innovation, investment and market transformation in the sector by providing a strong regulatory signal of the direction for future standards, and deliver higher performing buildings. The Australian Building Codes Board Intergovernmental Agreement (IGA) is currently under review, with an update due in June 2017. This provides an ideal opportunity to ensure that the objectives of the IGA are appropriately calibrated with Australia’s commitment to the Paris Climate Change Agreement. Broader sustainability, resilience and wellbeing principles should also be prioritised.

Energy Efficiency Obligation schemes

Energy Efficiency Obligation schemes are in place in New South Wales, Victoria, South Australia and the ACT. These schemes reward energy consumers who reduce energy consumption (e.g. through replacement of light globes) by requiring energy retailers to fund a set amount of energy efficient improvements each year. Energy Efficiency Obligation schemes have successfully incentivised third party aggregators to seek out and implement energy efficiency improvements in households and businesses.

Improvements could be made to existing Energy Efficiency Obligation Schemes to increase their impact:

- Harmonise and integrate schemes: Schemes are reviewed regularly to consider the inclusion of new technologies, products and methods. Harmonisation or integration of these processes between the different state schemes would reduce transaction costs, reduce the cost of expanding to other states and territories, reduce administrative costs particularly for smaller jurisdictions and reduce the cost of reviews and updates. Harmonisation could extend to reporting to ensure consistent data on the energy, emissions and cost savings achieved.

- Include incentives for replacement of non-electric appliances: As discussed above, gas and other non-electric appliances will need to be phased out, and Energy Efficiency Obligation schemes can begin to incentivise this switch, and need to avoid incentivising the replacement of inefficient electric appliances with more efficient non-electric appliances (e.g. replacement of electric resistance water heaters with gas water heaters).

- Incentivise deeper retrofits: A widespread concern with Energy Efficiency Obligation schemes is their ability to deliver deep retrofits, and indeed the risk that they can remove all of the ‘low hanging fruit’ in existing buildings, undermining the business case for returning to capture the harder or higher cost measures. Introducing project-based methodologies could encourage deeper retrofits, for example the NSW scheme rewards projects that demonstrate an overall NABERS rating improvement.

Those jurisdictions which do not have schemes (Queensland, WA, Tasmania and the Northern Territory) should introduce schemes.

Disclosure of building energy performance

Disclosure of building energy performance should be improved and expanded.

The Commercial Building Disclosure (CBD) scheme requires commercial office buildings above 1,000m² to disclose their energy performance rating (NABERS) at the point of sale or lease. In combination with government and large corporate tenant leasing requirements, this scheme has been instrumental in driving improvements in the large office sector. The needs of other building types outside the office sector may be different; however the potential expansion of disclosure policies to other building types should be investigated.
Disclosure of energy efficiency is already required for homes at the point of sale or lease in the ACT, with good results. There is a strong case to extend residential disclosure to other jurisdictions. NSW and Victoria are currently exploring such schemes and the National Energy Productivity Plan identifies the opportunity to implement a national approach to residential building energy ratings and disclosure.

ASBEC’s National Framework for Residential Ratings calls for a nationally consistent rating framework for housing sustainability, consisting of three key elements: minimum regulatory performance standards for new buildings; benchmarks for market comparison of best practice sustainability performance; and communication messages explaining the value of sustainability features to renovators and homebuyers.

**Question:** What are the opportunities and challenges of reducing emissions from the electricity sector? Are there any implications for policy?

**Independent Ombudsman**

There has been strong interest in distributed energy within the built environment. However, the current rules and regulations governing the operation of the National Energy Market (NEM) affect uptake of distributed energy and energy efficiency in a variety of ways:

- Electricity tariff structures can incentivise or disincentivise distributed energy and energy efficiency, with high fixed tariffs providing a disincentive and tariffs based more on the level of consumption providing a greater incentive;
- Value for electricity exported determines to a large degree the attractiveness of distributed energy installations;
- Costs of connection of distributed energy systems to the grid can affect the case for new distributed energy installations;
- Retailer licensing requirements for distributed energy power purchasing agreements (PPAs)

The processes through which electricity tariffs, ‘feed-in tariffs’ for exported electricity and costs of connection to the electricity grid and retailer licensing requirements are set are extremely complex, limiting the ability of non-technical experts including built environment stakeholders to participate and ensure that these parameters do not unduly disincentivise distributed energy and energy efficiency improvements.

Indeed, a number of reform processes are currently in progress that could have a major impact on energy efficiency and distributed energy, including the shift to ‘cost-reflective pricing’ and new standards for small-scale connections to the grid. As noted above, the establishment of an independent ombudsman or other independent authority to investigate and recommend solutions to address energy market barriers experienced by distributed energy, energy efficiency and built environment stakeholders, would help ensure that these processes support and do not disincentivise cost-effective uptake of energy efficiency and distributed energy.

**Electricity tariffs**

Electricity tariff structures should provide an appropriate incentive for distributed energy and energy efficiency, including through the current shift to ‘cost-reflective pricing’.

Electricity distribution network service providers are currently implementing a shift towards more cost-reflective pricing for electricity. This may result in an increase in fixed charges - generally daily charges that are imposed regardless of how much electricity is purchased from the grid. If fixed charges become a higher proportion of electricity bills, this could create a strong disincentive for the installation of distributed solar PV, as well as a disincentive to improving energy efficiency. This is because fixed charges remain the same regardless of how much electricity is consumed on-site.

With technology costs for solar PV and battery storage likely to reduce to such low levels, some analysts have predicted that disconnection from the electricity grid will become an attractive proposition for a significant number of building owners, particularly households. Disadvantageous tariff structures could accelerate this process, and lead to what many commentators have described as a ‘death spiral’ where disconnections force distribution network service providers to increase charges on remaining customers, which drives more customers to disconnect.
Electricity network companies currently develop their own proposals for tariffs, which can make it extremely difficult for non-technical experts in energy market regulations to monitor these and participate in reform processes such as the shift to cost-reflective tariffs.

A better process may be to establish a national process similar to the CSIRO Future Grid Forum to develop ‘model tariff structures’ in consultation with a range of industry and consumer groups that would encourage economically efficient investment in the energy market including in energy efficiency and distributed energy. It is not expected that these model tariff structures would be mandatory, but could help guide decision-making by networks and the Australian Energy Regulator.

**Value of exported electricity**

A mechanism should be established to identify and pass on to distributed generators for the fair value of distributed electricity exported to the electricity grid

Excess electricity generated on a building and exported to the grid current receives a very low rate (between 5 and 8 cents per kWh depending on the jurisdiction) when compared to the value for use on-site. However, there may be benefits provided by distributed generators that are not currently recognised or rewarded, including:

- Lower burden on grid infrastructure: Electricity generated locally is usually consumed nearby, imposing less of a burden on the electricity distribution network than electricity sourced from a centralised generator (e.g. a coal-fired power plant located outside a city). For this reason, the City of Sydney, Property Council of Australia and Total Environment Centre proposed a rule change to the AEMC which would require distribution network service providers to calculate the value of distributed generators operating in their network and pass on this value to them. This change was not supported by the AEMC.

- Reduced peak demand: Distributed energy paired with battery storage could be used to store energy from distributed solar systems at periods when demand is low and release this back into the system when demand is high. This can reduce the costs across the electricity network of meeting demand at peak periods, by reducing the need for higher cost ‘peaking’ plants that only operate at peak times, and by reducing the load on electricity transmission and distribution infrastructure. Again, the electricity market currently does not provide a mechanism for the value of this potential benefit to be passed on to the distributed generator.

While it appears clear that a mechanism should be in place to facilitate distributed generators to receive the full benefits that their system provides into the electricity system, there is not yet agreement on the precise mechanism for doing so. Identifying an appropriate mechanism should be a priority.

**Cost of connection**

Standards for connection of embedded generators should be established and the recommendation of the Harper Review of Competition Policy to improve access to the electricity network should be implemented.

Connection of distributed generators to the electricity network presents a strong barrier to further uptake of medium-scale solar PV and other distributed energy, as a result of:

- A lack of standardisation
- Un-transparent costs and delays
- A lack of an effective access regime

Two existing reforms could help address these issues and should be supported:

- Recently, the Clean Energy Council undertook a project to investigate the development of consistent standards for distributed generators of between 10 kW to 5 MW, to address the transaction costs associated with multiple different processes and standards for grid connection in place across the different electricity network companies. The study found that standards would address inefficiencies, reduce opportunity costs and save hundreds of millions of dollars over the next decade.

- The Harper Review of Competition Policy recommended that the Australian Energy Regulator’s role be divided between the ACCC (for consumer issues) and a new national access and pricing regulator, responsible for infrastructure regulation and access across a number of different industries. Shifting the role of regulating network access to a new access and pricing regulator could help reduce barriers to entry for distributed generators in the same way as has occurred with telecommunications.
Implementing the Harper Review recommendation will require significant work and should be commenced immediately.

Retailer licensing requirements

The Australian Energy Regulator (AER) should provide exemptions for Power Purchasing Agreement (PPA) providers as has been provided already in Victoria to facilitate local sharing of distributed solar and other distributed energy.

The AER undertook its consultation on innovative product offers in the national electricity market between 2014 and 2016. This resulted in a clarification of exemptions but it is our understanding from solar industry participants that this did not add value in negotiating or creating PPAs.

Exemptions for PPA providers would significantly reduce transaction costs and barriers to entry for businesses seeking to install distributed energy systems including solar PV and sell the electricity to the occupants of the building or nearby buildings. This model could apply to building owners seeking to install solar PV and on-sell the electricity to tenants, or to energy companies that install solar PV on others’ roofs and sell the electricity to the tenants.

National Electricity Objective

The “energy trilemma”, described in the Preliminary Report is an illuminating and helpful outline of the balance that needs to be struck between the competing priorities of energy security and reliability, affordability and emissions reduction.

It is important that the National Electricity Objective should recognise all three of these priorities.

ASBEC agrees with the principles outlined in the Group submission to Independent Review into the Future Security of the National Electricity Market in relation to the National Electricity Objective, and the advice that the AEMC should be directed to “reinterpret the long term interest of consumers to align its decisions with decarbonisation targets and to internalise the costs of climate change mitigation, adaptation, damage and inaction appears to be the most feasible way forward.”

Further enabling measures

Energy use is highly variable across the building sector, efficiency projects are often technically complex, and the opportunities to improve energy performance are fragmented across numerous small projects and decision makers. In order to achieve large-scale improvements in the energy performance of buildings, this complexity must be both reduced, so that consumers can understand the choices available to them, and outsourced to third party service providers. This requires improvements in energy data, information, research, education and training, including:

- The development of a national built environment energy data and information strategy in partnership with relevant industry and research organisations.
- Improvement of access to energy consumption data.
- A national built environment energy efficiency and emissions research agenda, and establish a permanent energy efficiency and distributed energy research institution.
- A national built environment energy efficiency and emissions education and training agenda.

Question: Australia has committed to considering a potential long-term emissions reduction goal for Australia beyond 2030. What factors should be considered in this process?

Cross-governmental and industry collaboration

Australia’s commitment to the Paris Agreement means that key stakeholder groups spanning all levels of government and industry must align their vision to achieve a common goal. Ambitious action is required by industry and government at all levels to facilitate carbon emission reductions in the short (2020), medium (2030) and longer term (2050).

While specific carbon emissions reductions have been set at the target of between 26 – 28% below 2005 levels by 2030, a coordinated approach is needed to achieve this. This is particularly true should Australia choose to ‘step-up’ its Nationally Determined Contributions under the Paris Agreement. Through our
members’ commitment to energy efficiency and emissions reduction, ASBEC has demonstrated that built environment stakeholders are ready collaborators.

**Government Market Power**

Government is a major presence in existing commercial buildings, particularly health and education (of which more than two thirds is public schools and universities), offices (of which 6 per cent is government-occupied) and other public buildings. In total, government-occupied premises account for 14 per cent of the identified emission reduction opportunity across commercial buildings.

Government can leverage this considerable market power to directly fund improvements to its own property assets and influence improvements in buildings which it occupies or over which it can exercise some level of influence.

Improving government buildings can:
- Provide leadership and demonstration: Improving government buildings can demonstrate to building owners more broadly the potential to improve energy performance and the benefits of doing so.
- Deliver major budget savings: For example, the former Victorian Greener Government Buildings (GGB) program delivered 28 large-scale projects with average savings of over 37 per cent across water, energy and emissions, and a return of investment of at least 12 per cent for all projects.
- Reduce costs and build skills and capability: Government leadership helps to accelerate deployment of new technologies and reduce the cost for others, and helps build capability and scale amongst energy efficiency service providers by providing a large, stable and certain flow of work. This can support development of effective business models for delivery of project, which can then be applied to other sections of the market.
- Improve public facilities such as schools and hospitals, with potential flow on benefits for health and educational outcomes.

Commonwealth, State and Territory governments should set ambitious targets for government owned and occupied buildings and for government procurement, and implement mechanisms to facilitate these improvements.

For all levels of government, there is often a lack of skills and expertise required to engage and manage energy experts. The States and the Commonwealth can jointly or individually fund the establishment of teams available to government officers whose responsibility it is to implement energy performance improvements, similar to the resource provided through the NSW Government Resource Efficiency Program (although this resource is not currently available to local government).

**Adaptation and Resilience**

Urban resilience refers to the capacity of individuals, communities, institutions, business and systems within an urban environment to survive, adapt and grow no matter what kind of chronic stresses and acute shocks they may experience. Climate change is currently an unavoidable ‘stress’ that must be carefully managed through the implementation of an intergovernmental regulatory framework that, in addition to a clear focus on reducing carbon emissions, should prioritise adaptation and resilience.

ASBEC’s [Built Environment Adaptation Framework](#) aims to:
- Protect the wellbeing of communities through targeted policy initiatives and better urban and building design
- Ensure appropriate institutional arrangements to facilitate resilience and adaptation
- Realise economic benefits from early adaptation through effective strategic planning and risk minimisation
- Advance sustainability through better resource and risk management strategies
- Increase community education and awareness about climate change risks and adaptation
The *Adaptation Framework* outlines the ways that the Australian Government, state, territory and local governments, industry, academia and the community sector can deliver effective resilience and adaptation strategies through:

1. Cross-sector engagement
2. Leading by example
3. Sponsoring applied research
4. Providing better access to information and tools
5. Investing in education
6. Providing incentives
7. Reforming and improving regulation
8. Reviewing building codes and standards
9. Improving planning systems and outcomes
10. Improving insurance and financial services

**Question:** What can be done to realise further benefits from emissions reduction activities beyond carbon abatement?

**Broader benefits of energy efficiency**

*Low Carbon, High Performance* outlines a comprehensive list of recommendations – summarised in this submission – to deliver energy efficiency and emissions reduction in the built environment. These measures can also deliver a broad range of powerful benefits to households and commercial building owners and occupants, as well as public economic, productivity and energy system benefits, including:

- Increases in asset value and returns for owners of buildings
- Health and productivity improvements for tenants in commercial buildings
- Comfort and wellbeing for households, particularly low income households, which are susceptible to fuel poverty
- Improved resilience for building occupants, in particular resilience in the face of thermal fluctuations, and to changes in energy prices.

Improving the energy efficiency of Australia’s building stock also has the effect of reducing the need for additional infrastructure to cope with peak energy demand.

**Realising co-benefits across infrastructure and cities policy**

ASBEC’s cities policy aims to maximise the benefits created by the world’s most urbanised nation. ASBEC’s *Investing in Cities* platform outlines four priority recommendations:

- Fully leverage the unique roles and responsibilities afforded to every sphere of government, industry and the community in developing our best urban centres and cities;
- Measure and report progress and inform good policy through transparent and consistent indicators applied across all our major cities;
- Work collaboratively across governments and with the private-sector to ensure best practice infrastructure planning and new investment, based on independent, transparent advice supported by broad cost-benefit analysis that appropriately considers environment impact and sustainability co-benefits;
- Deliver best practice urban environments through a commitment by all spheres of government to adopt and champion creating places for people: an urban design protocol for Australian cities.

The Commonwealth’s prioritisation of a Smart Cities Plan provides a synergistic opportunity to deliver a more sustainable built environment, reduce emissions and build resilience through cities policy and planning.

It will be important to leverage sustainable outcomes through the City Deals program, which can be realised at a precinct and project level – particularly through the use of robust and well-informed indicators and third party verification of processes and outcomes.
**Conclusion**

Buildings account for 23% of Australia’s emissions and the built environment provides an enormous and cost-effective emissions reduction opportunity.

Adopting energy efficiency actions in this sector alone could deliver a 23% reduction in emissions by 2030, and 55% reduction in emissions by 2050.

Delay in overcoming obstacles to improved energy performance risks locking in high levels of emissions and poor energy performance for decades to come. Five years’ delay would lead to $24 billion in lost energy savings for households and businesses to 2030 and the cumulative loss of 176 MtCO2e reduction opportunities.

Achieving a reduction in carbon emissions in the built environment and other high emitting sectors will require a step-change approach through strong policies that will ensure alignment and coordination of regulatory frameworks at the Federal and State/Territory level to Australia’s Paris Commitment.

Adopting ASBEC’s five key policy solutions would support a transition to high performance buildings and facilitate this step-change approach.

The built environment is ready to act on both the supply and demand-side of energy, for a faster and more effective transition to a low carbon future, and we seek Commonwealth policy support to do so.

We would be pleased to meet with you to discuss the recommendations developed by ASBEC that will help support the delivery of a productive agenda, and to discuss how best ASBEC and our member organisations can assist with ongoing consultation on these important issues.

Yours Sincerely

Ken Maher
President

Suzanne Toumbourou
Executive Director
# Appendix A: Recommendations for Low Carbon, High Performance buildings

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| 1.1| Establish a National Plan Towards 2050 Zero Carbon Buildings                   | Opportunities presented by energy efficiency and emissions reductions in the built environment sector are large but the impediments are numerous and complex. Numerous stakeholders are involved, including multiple levels of government, multiple different government departments, agencies and regulators, and multiple private and community sector stakeholders. Overcoming this level of complexity requires supportive governance arrangements, including:  
  - targets for emissions and energy in the built environment;  
  - coordination of activity across levels of government and government entities;  
  - regular public reporting of progress;  
  - public and industry engagement;  
  - coordination and planning of research, education and training; and  
  - clear responsibility for implementation, review and updating over time. |
| 1.2| Investigate the establishment of an independent Energy Efficiency Authority    | An independent authority could coordinate energy efficiency policy development and implementation, and evaluation and reporting of the effectiveness of energy efficiency policies. This would provide greater regulatory certainty and stability. |

<p>| 2.1| Review and upgrade minimum energy performance standards in the National Construction Code | Minimum standards for commercial buildings currently lag far behind best practice, and need to be updated urgently. A range of other potential improvements to both residential and commercial standards have been proposed. |
| 2.2| Implement a trajectory for future upgrades to minimum energy performance standards in the National Construction Code | Currently the Code is updated every three years, but the minimum energy performance standards are not necessary adjusted at this point. Establishing a trajectory for upgrades would enable industry to prepare for higher standards in the future and reduce the regulatory uncertainty and burden associated with ad hoc upgrades. |
| 2.3| Improve compliance and State/Territory-level enforcement of standards         | Recent reports have provided increasing evidence of under-compliance with existing NCC requirements. The NEEBP is focusing on this issue, and should be supported to continue to promote improved compliance and enforcement through improved compliance tools, and to monitor the impact of these tools and identify additional improvements required to address under-compliance. States and Territories should also work to improve their enforcement regime. |
| 2.4| Implement the recommendations of the GEMS Review to expand, strengthen and accelerate future improvements in minimum equipment and appliance standards | The GEMS review identified opportunities to improve minimum energy performance standards for appliances and equipment, and the process for updating standards over time. These recommendations should be implemented. |
| 2.5| Develop a proposal for introduction of minimum standards for rental properties  | Low income and vulnerable households in rental properties face much stronger barriers to improving the energy performance of their homes than other households, particularly split incentives and power imbalances with landlords. This provides a strong consumer protection rationale for introducing mandatory minimum standards. In addition, improving the performance of rental properties would reduce the burden on state and territory budgets of providing financial assistance to households unable to pay energy bills. |
| 2.6| Undertake a review to investigate the introduction of minimum energy performance standards for existing buildings | Minimum standards for existing buildings may be justified if the suite of measures in the NEPP fail to drive sufficient retrofitting activity. Simply signalling the future introduction of minimum standards may in itself drive substantial additional activity. Further investigation would be required to understand the need, potential impacts, timelines and costs and benefits of this measure. |</p>
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<td></td>
<td><strong>Policy Solution 3 - Targeted incentives and programs</strong></td>
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<td><strong>Policy Solution 3A - Leverage government market power</strong></td>
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<td>3.1</td>
<td>Commonwealth, State and Territory governments should set ambitious targets</td>
<td>Government-occupied premises account for 14 per cent of the identified opportunity for energy efficiency improvements. Governments can use their strong market presence drive large improvements in energy performance, which will provide leadership and demonstrate the benefits of improved energy performance, deliver financial savings for government budgets, reduce costs for others and build skills and capability, and improve public facilities such as schools and hospitals. Programs to improve energy use in government operations are well understood, and could be rapidly expanded to jurisdictions that do not currently have them in place.</td>
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<td>for government-owned and occupied buildings and for government procurement, and implement mechanisms to facilitate these improvements</td>
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<td>3.2</td>
<td>Commonwealth, State and Territory governments should fund programs to support local governments to improve their efficiency</td>
<td>Local governments have more limited skills and resources to identify and implement energy upgrade projects and improvement programs. Commonwealth, State and Territory governments should individually or jointly fund programs that provide access for local governments to advisory teams that can assist them to implement similar energy improvement programs.</td>
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<td><strong>Policy Solution 3B - Implement incentives to accelerate action</strong></td>
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<td>3.3</td>
<td>A review should be undertaken of the Emissions Reduction Fund to identify and address barriers to participation for buildings</td>
<td>Of the 129 contracts awarded in the second ERF auction, only three projects used the one available buildings method. The ERF in its current form appears to be unsuited to incentivising emissions reductions in buildings, and following the next auction scheduled for April 2016 should be reviewed to identify and address barriers to participation for buildings. This review should include consideration of whether a portion of the ERF funds should be redirected to other incentives or programs better suited to buildings.</td>
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<td>3.4</td>
<td>The Commonwealth should introduce green depreciation to accelerate uptake of energy upgrades to existing commercial buildings at the time of refurbishment</td>
<td>The Commonwealth is currently considering a range of potential tax reforms, and should include consideration of green depreciation in this context. Green depreciation would influence building owners undertaking refurbishments to include green measures at the same time. By allowing investors to defer tax payments, green depreciation can reduce the ‘timing gap’ problems of energy efficiency investments, where early capital expenditure must be incurred at the outset but financial savings accrue over the life of the asset. Green depreciation would appear as a revenue loss on government budgets, but would be offset by increased tax revenue in later years.</td>
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| 3.5| States and Territories should introduce incentives for high performing buildings, and as a priority investigate the introduction of stamp duty concessions and differential council rates in partnership with local government | A number of States and Territories are currently developing energy efficiency, renewable energy and climate change mitigation strategies, including Victoria, Queensland and South Australia. These work programs should include consideration of the introduction of incentives for retrofitting existing appliances, for new buildings and for the purchase of high efficiency equipment and appliances. Priority should be placed on:  
  • Stamp duty concessions for high performance homes, which could have a similar impact to green depreciation by targeting the point at which homeowners are considering making investments in their home prior to sale;  
  • Planning incentives such as density bonuses and green door policies, which could support accelerated deployment of high performing new buildings by targeting one of the highest priorities for new building developers - the cost, time invested and uncertainty of planning processes |
<p>| 3.6| States, Territories and local government should work together to introduce planning incentives for high performing new buildings | Planning incentives such as density bonuses and green door policies could support accelerated deployment of high performing new buildings by targeting one of the highest priorities for new building developers - the cost, time invested and uncertainty of planning processes.                                                                                                                                 |
| 3.7| Existing Energy Efficiency Obligation schemes should continue to be harmonised and integrated | Harmonising and integrating existing schemes will reduce transaction costs, reduce the cost of expanding to other states and territories, reduce administrative costs particularly for smaller jurisdictions and reduce the cost of reviews and updates. Victoria and New South Wales are already working on harmonising and integrating their schemes, and this should be extended to other jurisdictions and potential new schemes. Existing and new schemes should seek to include project-based methodologies that reward deeper retrofits rather than single product replacements. |</p>
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<td>3.8</td>
<td>Energy Efficiency Obligation schemes should be introduced in Queensland, Western Australia, Tasmania and the Northern Territory</td>
<td>Jurisdictions which do not currently have schemes should introduce them and design them to integrate with existing schemes.</td>
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<td>3.9</td>
<td>Energy Efficiency Obligation schemes should begin to incorporate incentives for the replacement of non-electric appliances</td>
<td>Non-electric appliances will eventually need to be phased out, and Energy Efficiency Obligation schemes should be reviewed to ensure that they are not incentivising installation of new non-electric appliances (e.g. gas water heaters) and eventually, to introduce incentives for the replacement of existing electric appliances. This should be initially piloted in states with rapidly decarbonising electricity supply, such as South Australia.</td>
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**Policy Solution 3C - Facilitation and support for distinct market segments**

| 3.10 | Consider the establishment of sectoral leadership groups in retail, health and industrial sectors | Government can help facilitate the establishment of sectoral leadership groups for market segments with strong consolidation, either nationally or in regions, cities or districts. These groupings can help market leaders overcome common barriers and accelerate improvements in their own buildings. In turn, this can have an effect on the broader market by demonstrating the potential for improvement and the benefits of doing so, and by changing mainstream practices within the supply chain. The Better Buildings Partnership in Sydney is an excellent example, and a similar model could be extended to other areas and other sectors, particularly retail, health and industrial sectors where strong consolidation exist. |
| 3.11 | Resource the Mid-tier Office Pathway and develop mid-tier retail pathway. | Offices and retail represent the largest share of the identified opportunity in the commercial sector. Despite improvements in the top-tier, mid-tier building owners still face significant barriers to realising these energy savings and the associated benefits. The opportunity is significant. For example, mid-tier offices are estimated to make up 52 million square meters of the 64 million square meters of office space in Australia. A multifaceted approach to connect and transform these sectors is required. Significant work has already been undertaken in the mid-tier office sector, culminating in the development of the industry-led Mid-tier National Office Pathway including the Building Retrofit Toolkit. If resourced, this pathway could be implemented within the next five years. A similar approach should be taken for mid-tier retail. |
| 3.12 | The Commonwealth, States and Territories should develop end-to-end support programs for low-income households | Low income households tend to live in more inefficient dwellings than other households, spend more of their household income on energy, and face stronger barriers to upgrading including strong split incentives between tenant and landlord and low capability to fund upgrades. Poor housing can increase the financial and health vulnerability of low income households, creating a strong rationale for establishment of targeted end-to-end programs aimed at low-income households. Programs should be developed building on insights from the NEPP best practice guidelines project and the Commonwealth Low Income Energy Efficiency Project. |
| 3.13 | State and Territory governments should establish rising minimum standards for public housing and facilitate funding mechanisms to facilitate public housing retrofits | State and Territory governments control a substantial portion of low-income housing stock through public housing. There is a strong case for standards to be introduced for existing assets, and mechanisms be provided to facilitate upgrades of these publicly owned assets to unlock emissions reductions and support low income households reduce their cost-of-living. |

**Policy Solution 4 - Energy market reforms**

<p>| 4.1 | Establish an independent industry Ombudsman or other independent authority to investigate and recommend solutions to address energy market barriers | Australia’s energy market rules and regulations have a strong impact on the ability of built environment stakeholders to implement energy efficiency and distributed energy in buildings. However, the processes by which these rules and regulations are set are extremely complex, limiting the ability of non-technical experts including built environment stakeholders to participate. A number of these processes are underway at the moment. The establishment of an independent Ombudsman or other independent authority to investigate and recommend solutions to address energy market barriers experienced by distributed energy, energy efficiency and built environment stakeholders over time, and voice their concerns in the context of energy market processes and reforms, would help ensure that these processes support and do not disincentivise cost-effective uptake of energy efficiency and distributed energy. |</p>
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<td>4.2</td>
<td>Ensure that electricity tariff structures provide an appropriate incentive for distributed energy and energy efficiency, including through the current shift to ‘cost-reflective pricing’</td>
<td>Electricity distribution network service providers are currently implementing a shift towards more cost-reflective pricing for electricity. This may result in an increase in fixed charges, which could create a strong disincentive for the installation of distributed solar PV, as well as a disincentive to improving energy efficiency. Electricity network companies currently develop their own proposals for tariffs. A better approach would be to establish a national process similar to the CSIRO Future Grid Forum to develop ‘model tariff structures’ to help guide the AER’s consideration of new tariff proposals.</td>
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<td>4.3</td>
<td>Establish a mechanism to identify and pass on to distributed generators the fair value of distributed electricity exported to the electricity grid</td>
<td>Electricity generated locally by distributed generators including solar PV systems may deliver a range of network benefits that are not currently recognised in the rate paid to generators. A mechanism should be established to identify any benefit identified, and pass this on to distributed generators.</td>
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<tr>
<td>4.4</td>
<td>Establish standards for connection of embedded generators &amp; implement the recommendation of the Harper Review of Competition Policy to improve access to the electricity network</td>
<td>Connection of distributed generators to the electricity network presents a strong barrier to further uptake of medium-scale solar PV and other distributed energy, as a result of a lack of standardisation, un-transparent costs and delays and a lack of an effective access regime. These barriers need to be addressed. Two processes exist to address these issues. The Clean Energy Council (CEC) is currently investigating the possibility of standardisation of connection processes, while the Harper Review of Competition Policy recommended improvements in the access regime for energy networks.</td>
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<tr>
<td>4.5</td>
<td>The Australian Energy Regulator (AER) should provide exemptions for Power Purchasing Agreement (PPA) providers as has been provided already in Victoria to facilitate local sharing of distributed solar and other distributed energy</td>
<td>Exemptions for PPA providers would significantly reduce transaction costs and barriers to entry for businesses seeking to install distributed energy systems including solar PV and sell the electricity to the occupants of the building or nearby buildings. This model could apply to building owners seeking to install solar PV and on-sell the electricity to tenants, or to energy companies that install solar PV on others’ roofs and sell the electricity to the tenants.</td>
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**Policy Solution 5 - Improve energy data, information, research, education and training**

<p>| 5.1 | Develop a national built environment energy data and information strategy in partnership with relevant industry and research organisations | Energy data and information is currently managed by a range of different organisations. Many other policies and programs rely on the data collected and tools administered by these organisations. For example, the Commercial Building Disclosure Scheme requires disclosure of energy performance based on NABERS ratings, while the National Construction Code references the NatHERS residential rating tool to set the minimum energy performance standard for homes. A national strategy should be developed to ensure that ongoing improvements in energy data and information are coordinated and funded. |
| 5.2 | Improve access to energy consumption data | For energy consumption data to be useful, it is essential that it is accessible to both consumers and third party service providers at low effort, at low or zero cost and via cloud-based smart phone apps the current process for accessing energy consumption data is not streamlined and varies depending on the geographic location and electricity distribution network service provider. An inquiry should be undertaken as part of NEPP Measure 24 (‘improving the exchange of market data’) to investigate ways to facilitate better access to energy data, with consideration of the establishment of a central, streamlined and highly accessible open data platform for energy consumption and performance data. The platform should also facilitate public access to aggregated and de-identified data for researchers. |
| 5.3 | Expand mandatory disclosure to smaller offices and investigate the possibility of requiring disclosure for other building types | The Commercial Building Disclosure (CBD) scheme requires large commercial office buildings (above 2,000 m²) to disclose their NABERS energy rating at the point of sale or lease. In combination with government and large corporate tenant leasing requirements, this scheme has been instrumental in driving improvements in the large office sector. The Commercial Building Disclosure review recommended extending this scheme to all commercial offices above 1,000m², and ASBEC supports this recommendation. The needs of other building types outside the office sector may be different, however the potential expansion of disclosure policies to other building types should be investigated. |</p>
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<td>5.4</td>
<td>Implement mandatory disclosure of energy performance for residential buildings, beginning with pilots in one or more jurisdictions</td>
<td>In the residential sector, disclosure is already required for homes at the point of sale or lease in the ACT, with good results. There is a strong case to extend residential disclosure to other jurisdictions, beginning with a pilot in one or more states over the next two years, while developing the framework for implementation of a nationally consistent scheme in 2018. This will also allow time to investigate potential improvements in and harmonisation of residential rating schemes.</td>
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<td>5.5</td>
<td>Develop a national built environment energy efficiency and emissions research agenda, and establish a permanent energy efficiency and distributed energy research institution</td>
<td>Australia has a very well-developed set of research and innovation entities, including in particular the CRC for Low Carbon Living working on primary research relating to energy and emissions in the built environment amongst other areas, ARENA which provides funding for early stage renewable energy technologies and the Clean Energy Finance Corporation to support commercialisation. What is missing in Australia is a mechanism to coordinate research on built environment energy efficiency and emissions. To fill this gap, it is recommended that government consider the development of a permanent national built environment energy efficiency and emissions research agenda and the establishment of a national built environment research body. In addition, ARENA’s mandate should be expanded to include energy efficiency, building on the work of the CRC for Low Carbon Living, and the forthcoming establishment of Innovation and Science Australia.</td>
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<td>5.6</td>
<td>Develop a national built environment energy efficiency and emissions education and training agenda</td>
<td>In recognition of the broad need for upskilling amongst many different industry sectors, the national buildings plan should include the development of a national built environment energy efficiency and emissions education and training agenda and co-ordination with existing industry bodies such as the Energy Efficiency Council and Clean Energy Council, and education and training institutions such as the Industry Skills Council and AQSA.</td>
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