

Australian Building Codes Board

C/- NCC 2022 review team
GPO Box 2013
Canberra ACT 2601

15 October 2021

To whom it may concern,

Re: Submission on proposed energy efficiency updates to the National Construction Code

Engineers Australia appreciates the opportunity to comment on the proposed energy efficiency updates to be incorporated in the 2022 edition of the National Construction Code (NCC).

Engineers Australia is the peak body of the engineering profession in Australia. We are a professional association with about 100,000 individual members. Established in 1919, Engineers Australia is a not-for-profit organisation, constituted by Royal Charter to advance the science and practice of engineering for the benefit of the community.

Once in a lifetime opportunity

Practical policy is an element of nation building. The NCC updates provide a major opportunity that cannot be overlooked for bringing greater alignment between the energy and building sectors, and emerging technologies and safety of future buildings. Linking these sectors through practical actions gives Australian households better ways to contribute to tackling climate change and the ability to better manage their energy needs.

Engineers Australia supports advancing the NCC 2022 updates on the current timeline. Our submission focuses on ensuring the proposed NCC updates deliver practical outcomes connecting the energy and building sectors. A holistic approach is needed to properly meet contemporary consumer expectations for practices that work in their long-term interests.

Engineers Australia's considered view on the Public Consultation Draft (PCD) is that more advice is required to connect sectoral policy initiatives coherently. The energy sector reforms are moving at high pace in response to unprecedented uptake of technological innovation. Moreover, the publicly available technical advice to the Australian Building Codes Board (ABCB) appears incomplete.

Many open questions remain. For example, addressing operating and safety features of new energy products (such as fire risk caused by electric vehicles). There is significant literature on difficulties in manual suppression of electric vehicles fires on open roads, and significant literature to suggest that the Deemed to Satisfy (DtS) automatic fire suppression systems and fire brigade intervention facilities cannot manage the risk presented by electric vehicles in carparks. Likewise, NCC Section C regarding fire spread and structural behaviour for Class 7a is based on internal combustion engine vehicles from 20 years ago and is more likely than not inadequate for electric vehicles.

For more details, please refer to technical submissions from others, such as Basic Expert.

The NCC is also encouraged to take a proactive approach to these matters and consider out of cycle reviews when new technologies demand swift responses to keep the NCC sufficiently current

An integrated and adaptive approach requirement

The impetus for the current energy efficiency updates to the NCC is to advance the *National Energy Productivity Plan (2015-2030)* (NEPP)¹ by acting on *Measure 31 – Advance the National Construction Code*, as set out in the *Trajectory for Low Energy Buildings (2019)* (the *Trajectory*)².

Measure 31 is designed to deliver productive energy services as part of a suite of consumer protection measures designed to remedy failures of the market to “provide efficient minimum services and adequate protections for consumers.” The NEPP noted that “consumer protections will...be central to related work considering new disruptive technologies and subsequent new services.” Consequently, the NEPP requires an integrated and adaptive approach to shaping energy productivity services to benefit consumers.

Advancing energy efficiency through the National Construction Code

The original intention of Measure 31 was to remedy a situation where technology outpaced regulation for building construction. Public information on the NEPP outcomes is limited because reporting ceased after 2018 and the required NEPP review in 2020 has not been completed. The *2018 NEPP Annual Report*, for example, foreshadows the 2019 energy efficiency updates to the NCC, but does not track implementation any further. Consequently, it is difficult for anyone to assess whether regulation and the NEPP is fit-for-purpose, especially with respect to Measure 31.

It appears that the direction to ABCB for the proposed NCC 2022 energy efficiency updates addresses Measure 31 without integrating with other relevant measures within the NEPP *productive energy services* stream including:

- Measure 13. Support innovation and commercialisation (Innovation support)
- Measure 19. Emerging technologies in the electricity system (Competitive modern markets)
- Measure 26. New market mechanisms for demand response (Competitive modern markets)

The ABCB has taken a linear accumulation approach to implementing the direction provided by the *Trajectory* that cannot be realised. The PCD sets energy and comfort requirements for each new home in isolation. This approach assumes individual improvements will aggregate to national energy and emissions savings.

The changes do not factor in advancing interactions of those homes with Australia’s rapidly changing energy markets and electric power system. For example, recent work by the Australian Energy Market Operator, University of New South Wales, Energy Queensland and Standards Australia³ demonstrates adding a zero energy budget to the NCC does not linearly equal productive energy services nor provide consumer protections. It highlights the network challenges faced by South Australian Network Planner in accommodating high levels of rooftop PV. This situation

¹ COAG Energy Council, *National Energy Productivity Plan 2015-2030*, (2015), available at: https://energyministers.gov.au/sites/prod.energycouncil/files/publications/documents/National%20Energy%20Productivity%20Plan%20release%20version%20FINAL_0.pdf

² COAG Energy Council, *Trajectory for Low Energy Buildings (2019)*, available at: <https://energyministers.gov.au/publications/trajectory-low-energy-buildings>.

³ N. Stringer A. Bruce, I. MacGill, N. Haghadadi, P. Kilby, J. Mills, T. Veijalainen, M. Armitage, and N. Willmot, *Consumer Led Transition: Australia’s World Leading Distributed Energy Resources IEEE power and energy magazine* (Nov/Dec 2020). Available at: https://www.nxtbook.com/nxtbooks/pes/powerenergy_111220/index.php?startid=2#/p/20.

prompted a recent change to the National Electricity Rules that introduces new costs for households exporting power⁴.

Delivering better, connected services for Australian home owners and occupants

The PCD is not aligned with the service-based reforms contemplated for the energy market. The Energy Security Board (ESB) recently released a plan to develop services that support the rapid uptake of distributed energy resources and flexible demand.⁵ As part of this plan the ESB is seeking to establish a fast, flexible and transparent technical standards setting process suitable for the fast-changing nature of Distributed Energy Resources (DER) technology and energy markets.⁶

The proposed NCC changes do not reference nor link to the ESB initiatives. Additionally, the Australian Renewable Energy Agency (ARENA) recently undertook an assessment of DER technology integration,⁷ finding DER technical features are at best 'partially mature'. Significant work is still needed to de-risk the technologies introduced into homes via the provisions in the PCD (for example, directly through solar PV rooftop generation and indirectly through load shifting).

Risks to builders and consumers

Having two disconnected processes places risk on builders and consumers in terms of being properly informed.

- The proposed NCC changes require adding technology to meet an energy budget.
- The ESB changes provide incentives for homes to contribute to broader objectives (related to energy security and access) through the design of services and technical standards.

Without a means to align the NCC and ESB initiatives, energy end users (builders and consumers) will be forced to work with misaligned standards and incentives and without safeguards that achieve the intended consumer protections of Measure 31. Consequently, the current ABCB pathway will make energy productivity services more difficult for builders and consumers to access.

Moreover, this pathway puts at risk realising the expectation of the Energy National Cabinet Reform Committee.

Nation building

Nation building requires pragmatic vision. Vision starts with seeing everything that is relevant by being properly informed. Our submission identifies major gaps in the PCD that prevent achieving the desired energy efficiency and consumer protection outcomes.

Engineers Australia is concerned that the ABCB needs more advice on these emerging and technical issues. This includes seeking practicable advice that comes with a depth of understanding into future problems, minimising risk of unknown and ongoing costs to consumers. For example, the advice on electric vehicle fire safety appears to be

⁴ Australian Energy Market Commission (2021) *Access, pricing and incentive arrangements for distributed energy resources: Final Rule Determination* – ERC0311.

⁵ Energy Security Board, (July 2021), *Unlocking benefits of change for consumers: integration of distributed energy resources and flexible demand*.

⁶ Australian Energy Market Commission (2020), *Governance of distributed energy resources technical standards* (Rule Change Request -- ERC0319).

⁷ Australian Renewable Energy Agency (Feb 2021) *State of distributed energy resources technology integration report*. Available at: <https://arena.gov.au/assets/2021/02/state-of-distributed-energy-resources-technology-integration-report.pdf>.

incomplete, leaving the ABCB open to needing an NCC revision, and with irregularities that flow onto consumers and first responders. More detailed, thorough research should be supported.

With complete advice, the NCC will be empowered to shift from incremental gains in productivity to practical gains that scale at pace, improving both productivity and prosperity. Engineers Australia would welcome working with the ABCB in seeking direction for gaining complete advice.

To discuss this submission further, please contact Baoying Tong, Senior Manager for Building Reforms and Projects, at BYTong@engineersaustralia.org.au.

Kind regards,

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