

NABERS EMBODIED EMISSIONS CONSULTATION PAPER – AUSTRALIAN INSTITUTE OF ARCHITECTS RESPONSE

Submission made on 16 February 2022 via [NABERS Online Survey portal](#)

a. **How likely is your organisation to use or promote the use of a NABERS Embodied Emissions tool as outlined by the proposals in this consultation paper?**

The Australian Institute of Architects (Institute) is the peak body for the architectural profession in Australia. It is an independent, national member organisation with around 13,000 members across Australia and overseas. The Institute exists to advance the interests of members, their professional standards and contemporary practice, and expand and advocate for the value of architects and architecture to the sustainable growth of our communities, economy and culture.

The Institute supports and applauds NABERS in the general overview, aims, problem analysis and objectives, to address embodied emissions of the built environment currently and as projected in 2050. This strongly aligns with the Institute's policy positioning statement on Climate Change Action which is:

1. *The Institute calls on Energy Ministers, Building Ministers and Planning Ministers to urgently agree to a new national policy for the Built Environment which: supersedes the Trajectory for Low Carbon Buildings; expands the scope of the 2025 National Construction Code; and commits to:*

All new buildings and major renovations having net zero operational carbon emissions by 2030.¹

- o *All existing buildings having net zero operational carbon emissions by 2040².*
- o *Nationally consistent methodology for mandatory embodied emissions measurement and reporting in state and territory legislation by 2025³.*

¹ UNSW (2021). Race to Net Zero Carbon: A climate emergency guide for new and existing buildings in Australia: Retrieved from: [Race to Net Zero Carbon: A Climate Emergency Guide for New and Existing Buildings in Australia \(unsw.edu.au\)](#) and GBCA (2021). Climate Positive Buildings & our Net Zero Ambitions: Guidance for Green Star on the use of offsets and renewables. Retrieved from: [www.new.gbca.org.au](#)

² IEA (2021). Net Zero by 2050: A roadmap for the global energy sector. Retrieved from: [www.iea.org/reports/net-zero-by-2050](#) and GBCA (2021). Climate Positive Pathway for Existing Buildings. Retrieved from: [PowerPoint Presentation \(gbca-web.s3.amazonaws.com\)](#)

³ UNSW (2021). Race to Net Zero Carbon: A climate emergency guide for new and existing buildings in Australia: Retrieved from: [Race to Net Zero Carbon: A Climate Emergency Guide for New and Existing Buildings in Australia \(unsw.edu.au\)](#)



- *All new buildings have a 40% reduction in embodied carbon by 2030⁴.*
- *All new buildings and major renovations have net zero embodied carbon by 2040⁵.*

The Institute calls on Energy Ministers, Building Ministers and Planning Ministers to allocate funding for all measures under 1).

2. *To support international efforts to maintain global temperatures at 1.5° C above pre-industrial levels, the Australian Institute of Architects supports:*

- *The elimination of the use of natural gas in all new buildings from 2025.*
- *The retrofitting of all existing buildings to only use clean energy by 2040.*
- *The rapid decarbonisation of Australia's electricity grids and rapid uptake in on-site generation of renewable energy."*

The Institute will support the adoption and implementation of the NABERS Embodied Emissions tool, noting recommendations throughout the response and consideration of the following:

- Need for targets and benchmarks
- Need for adoption by the government (all jurisdictions) and used:
 - In procurement
 - To ensure fair competition
 - For standardisation of assessment of government-owned assets
- Need for use early in the design process (becoming a design tool, and not just a certification tool)
- Consideration and articulation of who would operate the tool (i.e. will this be used by architects or outsourced to specialist consultants)
- Future development of tool articulation:
 - Projected timeline
 - Recommendation of adoption date by Australian Standards and in the National Construction Code (mandating use)
 - Consideration of cost to project and impact on project delivery

b. What is working well in the proposals and should be retained in the final tool?

NABERS wants to understand what you like, what works and how the recommended approach aligns with the tool's objectives and market needs. It's important we know what is working well so we can know which elements should be retained.

The NABERS Embodied Emissions Tool is a great starting point in developing a holistic embodied emission measurement and certification tool, which will aid in capturing emissions from the built environment.

⁴ GBCA (2021). Climate Positive Buildings & our Net Zero Ambitions: Guidance for Green Star on the use of offsets and renewables. Retrieved from: www.new.gbca.org.au

⁵ UNSW (2021). Race to Net Zero Carbon: A climate emergency guide for new and existing buildings in Australia: Retrieved from: [Race to Net Zero Carbon: A Climate Emergency Guide for New and Existing Buildings in Australia \(unsw.edu.au\)](http://Race to Net Zero Carbon: A Climate Emergency Guide for New and Existing Buildings in Australia (unsw.edu.au))



It will be of pertinence to seek regular feedback and maintain regular communication with users as the use of the tool commences and expands. Continual clarity of how the tool will be implemented, rolled out, updated and audited is required.

Proposal-specific feedback:

- Proposal 2: The articulation of lifecycle stages is sound and the focus on A1-A5 GWP over other impacts and stages is logical for the commencement of use of the tool. There is an opportunity to make the data on commitments for benchmarks, analysis and certification openly accessible for educational and societal accountability reasons.
- Proposal 9: The Institute supports setting carbon emissions target and iterative reviews during the design stage.
- Proposal 10: The Institute supports the regular update of benchmarks to align with best practices and development of construction methodologies.

c. Are there any risks to the proposed approach and what would help to overcome them?

NABERS wants to understand any potential risks to the objectives and market needs. How might NABERS mitigate these risks if we proceed with the proposals in this paper?

The NABERS Embodied Emissions tool does not assess the building's impact on the embodied carbon of 100% renewable electricity grids. There is an opportunity for the tool to compare the embodied carbon in the new building with the embodied carbon in the extra grid capacity and storage that is required because of the new building. This will allow a comparison of the building envelope and design options, with operational emissions for aggregated best emission options for the lifetime of the development.

Proposal-specific feedback:

- Proposal 1: Generally, the limitation of certification eligibility to new buildings and major refurbishments is supported. It is recommended to undertake further research to assess the impact of periodic tenancy fit-outs over the lifecycle of the buildings (which may occur as frequently as every 3-5 years) in large commercial buildings. It is likely that in such scenarios, the impacts may be considerable and necessitate consideration into adoption in future development of the tool.
- Proposal 2:
 - o Albeit limiting the scope to A1-A5 upfront emissions is a supported starting point, the Institute recommends the development of a comprehensive timeline articulating when further emissions will be adopted in the tool. The tool's limited scope will not provide clear direction on whether more embodied carbon should be used upfront to reduce the embodied carbon associated with the maintenance of the building. For example, having exposed timber cladding will look like a good option in the proposed tool but if the cladding needs to be oiled every 2 years and replaced every 20, it might be a bad option.



- The 80% figure stated (in relation to estimates of whole-of-life emissions generated upfront) appears to be an overestimation of the significance of upfront carbon. The accompanying technical report puts this figure at more like 63% (page 122). Combined with Proposal 1 (where MEP and tenant improvements are excluded from scope), only ~50% of identified all-scope emissions will be calculated as part of the NABERS rating. This is likely to lead to general market confusion as to the actual impact (and definition) of embodied energy in buildings.
- Proposal 3: The exclusion of demolition risks that:
 - The certified embodied emission value does not correspond to the development carbon footprint (data integrity compromise).
 - Retention and reuse of existing buildings in developments is not encouraged.
 - Good demolition/dismantling practice is not encouraged.
 - Types of demolition that should be incentivised:
 - demolitions that save materials, sort waste streams, and limit transport of waste off site. i.e. a demolition where bricks and timber are taken down carefully so that 90% can be saved for reuse should be treated differently to one where only 30% of the materials can be reused in their current form.
 - demolition where materials are well sorted so they can be recycled/ downcycled should be treated differently to one that has a higher proportion of mixed waste going to landfill.
 - Recycled materials that are reused from site compared to ones that are bought in from off site.
- Proposal 4: The limitation to the cold shell as the default building scope poses limitations in the measurement of emissions and in the design process when assessing long-term impacts of HVAC system use, on-site power generation and impact of the building envelope and fit-out. Consideration, planning and future development of the tool needs to consider expanding this limitation. The reasoning for consideration of the inclusion of the warm shell is as follows:
 - Higher quality buildings that are designed and built to avoid extensive and ongoing fit-out should be rewarded.
 - Buildings that use the cold shell building fabric to form the final finish shouldn't be penalised. i.e. a building that has a burnished concrete slab as its finished surface as opposed to a slab that requires tiles/carpet/floating floor.
 - Buildings that are designed to reduce the amount of HVAC required (including the ongoing embodied carbon in its maintenance and replacement every 15 or so years) should be rewarded.
 - Although the warm shell only forms a small proportion of the upfront cost, it forms a large proportion of embodied carbon over the life of the building. i.e. if a building lasts 100 years, the HVAC might be replaced 6 times and will incur ongoing maintenance.
- Proposal 5: There is a risk of reinforcing the current market's '[carbon tunnel vision](#)', where other impacts of products may be significantly detrimental to different areas of the environment, e.g. ozone depletion, acidification potential, and eutrophication potential.
- Proposal 7: There is risk in encouraging and promoting 'carbon neutral certified' products without a national standard/measuring/certification tool for these products. While the Climate Active Carbon Neutral pathway offers



slightly lower risk, standard 'carbon neutral' certification is largely under-regulated and can be achieved without even significantly reducing the embodied energy used to create the products. This is particularly concerning given the recent controversy around the legitimacy of the Australian carbon credit system.

- Proposal 8: The use of BOQ data for benchmarking has the benefit of data integrity, however, may substantially limit the dataset, especially on some building typologies. Except on large/complex infrastructure projects, the use of BOQ's on projects is not consistent due to cost, procurement models (in particular on builder-led projects), and low-margin tendering practices leading to BOQ's being used as an adversarial variation tool. We would recommend comparing BOQ dataset based on building class typology to ascertain where data gaps occur, with strategies of addressing these gaps with other data collection methodologies. In the long-term, there is an opportunity to incentivise use of BOQ's on projects, which will strengthen data integrity. It is also recommended that BOQ data used for embodied carbon input should be verified as part of the rating process, i.e. checked against current BIM models or take-offs.
- Proposal 9: There is a significant opportunity to use the tool during the design process to inform the best outcomes for future developments. Leaving calculations and assessment of embodied carbon until after practical completion is reductive and destroys the potential positive impact for reduction of embodied carbon in the design process of commercial buildings. Introduction of milestone certification may alleviate this issue.
- Proposal 10: It is recommended that a timeline is published for future development proposals to ensure clear communication to users and ongoing confidence in the tool. Proposals (a) – (e) are supported, however, we note the following additional considerations:
 - o Change the way operational carbon is accounted for to reflect the extra electricity network capacity and storage that is required as a result of the new development.
 - o Buildings that don't increase the need to add extra electricity network capacity and storage should be rewarded.
 - o Develop a tool that includes the embodied offsite carbon that is required as a result of the new development.

d. What should we consider in finalising this approach?

Please note why these considerations are important in achieving the objectives and market needs.

The Institute deems a need for architects to be at the forefront of the implementation of an embodied emissions tool. We recommend the investment in ensuring that the format and display of the system are targeted at architects/designers and not limiting this to engineering or specialist consultants. Further, we recommend investment in training, frequent review and incentivisation of early adoption to build credible benchmarks and improve industry literacy.

The plan needs to be regularly updated for further expansion and improvement of the scope, and strict adherence to the proposed roadmap for future development will be required for industry confidence in its adoption and implementation.



Proposal-specific feedback:

- Proposal 2: If the aim is for a simple tool, it is logical to limit the inputs to the cold shell, with scopes A1-A5. It should be made clear in the tool and reflected in the estimated total carbon footprint (whether expressed in kg CO₂-e / m² or total tCO₂-e) the estimated impact for all scopes (excluding B6 + B7). This could be done by using benchmark averages like those described in the technical report to add 'average' impacts of MEP & TI to the calculation until the tool is developed to allow input for more detailed scopes.
- Proposal 3: The Institute recommends the consideration of incentives to ensure proper waste stream diversion and recycling of any demolished materials in addition to the proposed 'reward' for reuse of materials.
- Proposal 4: Difficulty in accurately measuring the warm shell components is noted due to potentially being installed by many different delivery teams. However, they should be represented in the embodied impact calculation in some form, even if by using benchmark averages per above. Setting this benchmark to a conservative estimate would encourage accurate calculation as to reflect the 'true' impact of the installed systems.
- Proposal 5: There is an opportunity to include other major environmental indicators where the data already exists for the product but show as 'N/A' where data has not been reported. Support having the expansion of environmental indicators on the product roadmap.
- Proposal 7: It is an inappropriate assumption to count 'carbon neutral certified' products as having no upfront carbon. Suggest limiting input data to be from LCAs (the various formats listed in the proposal) and EPDs.
- Proposal 9: Where buildings are required to have a NABERS rating, mandate carbon emissions targets have been set and preliminary calculations have been done as part of the Development Approval process, which should indicate the target can be achieved with the specified design. Maximising benefit of tool use by enabling the introduction of milestone assessment early in projects as a design tool (ideally before BOQ exists).

e. General feedback

There is a strong need for an Australian-based embodied emission tool and data collection/benchmarking tool (per building type, scale, new or renovation) which is improved over time.

We recommend:

- Development of strategy to ensure that the adoption of the tool is mandated (via Australian Standards/National Construction Code).
- Partnership with other organisations (e.g. CSIRO) in developing future "whole of building" star rating that takes into account energy efficiency and other omitted limitations.