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Submitted to **Energy efficiency - NCC 2022 and beyond scoping study**

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Personal Information

What is your email address?

Required:

casbe@mav.asn.au

What is your name?

Name:

Shannon Best

What is your organisation? (if applicable)

What organisation are you in? (if applicable):

Council Alliance for a Sustainable Built Environment

Which best describes your industry sector?

Which best describes your industry sector?:

Government

Please select your State or Territory

State or Territory:

Vic

Residential energy efficiency

Question 1

Option 1

Please explain your response and provide additional information to support your view.:

We support raising the required star rating of the envelope to 7 stars, for the reasons already outlined in the scoping study. We draw attention to previous work undertaken by Climate Works and ASBEC (Built to Perform - An industry led pathway to a zero carbon ready building code, and Built to Perform in Northern Australia - An industry led pathway to a zero carbon ready building code), and the work undertaken by AECOM for DOEE. We also draw attention to the Living Well – Apartments, Comfort and Resilience in Climate Change report by Thrive Research Hub of University of Melbourne.

We are concerned however, that industry is currently non-compliant with the current energy efficiency standards, and that this needs to be addressed as part of an increase in regulatory requirements. We therefore emphasize that raising the required star rating of the envelope to 7 stars must be combined with:

- Mandated on-site verification and certification of airtightness target in all new homes. Compliance pathways should be onsite, whole of house and include a blower door test to verify air tightness.
- Two additional checks are recommended by Builders Surveyors to check draught sealing and insulation. These two checks should occur prior to insulation, and prior to plaster, with photographic evidence collected by the Building Surveyor for on-site verification and certification. Alternatively an on-site expert for proving compliance (e.g. modified Clerk of Works approach).
- Modelling of NatHERS should consider the installation of a mechanical HRV as these systems circulate heat around the home.
- Guidance documents to industry on these changes.

We support the adoption of more stringent building envelope sealing targets in buildings. We are of the view that the current verified 10m³/hr.m² at 50 Pa standard should be improved, as well sealed buildings deliver improved energy and health outcomes. We are also of the view that the elemental provisions can be significantly improved towards meeting an equivalent outcome to the verification method. We recommend that the ABCB undertake research to determine the impacts and benefits of requiring:

- Minimum standard of 6 m³/hr.m² at 50 Pa for all new homes, and
- A mechanical HRV system for all new homes with appropriate requirements for performance of the HRV system.

We support a 'whole-of-house' approach to energy assessment, however recommend that the following appliances are included in the regulated building services:

a) Cooking appliances, dishwashers, washing machines, dryers, pool and spa heaters.

We support the net zero annual energy use target for regulated building services.

CASBE's strategic aspiration is for all new buildings to be carbon positive as soon as possible. To that end, we have incorporated minimum energy targets and stretch targets into our assessment processes to encourage the shift to a zero-carbon future. We have found that many projects achieve these higher standards.

Question 2

No

Please explain your response and provide additional information to support your view.:

The metrics noted of HDH, CDH and DGH are acknowledged as being linked to thermal comfort, however the NatHERS tools use sophisticated approaches to modelling that are preferable to this very simplistic approach to setting standards and calculating outcomes for thermal performance and thermal comfort.

Allowing for these metrics to adjust automatically for future climate conditions are useful given the reality of climate change.

Question 3

No

Please explain your response and provide additional information to support your view.:

It is unclear where the values for the formula come from. Modelling is required to ensure that objectives of government and industry strategies and targets are met. It is also unclear how the target unit cost of energy would be derived, and whether associated data is available in the Australian context, and of suitable quality, for this purpose. The process for accessing this data and determining the calculation approach and targets is unclear.

Using a cost approach is not consistent with the target setting and metrics included in the research work undertaken by ASBEC, Climate Works and AECOM.

It is also a step away from the key intent of energy targets and provisions in the NCC.

Due to the approach noted in the scoping paper, the moderate target setting is unclear from an energy use perspective.

Related to setting a maximum allowable energy usage, how is this intended to be applied for Class 2 SOUs? Per dwelling or per building? The attribution of energy usage from central systems and contribution of renewable energy systems to the energy budget is unclear. Similarly for Class 4 dwellings and mixed-use buildings.

Question 4

Yes

Please explain your response and provide additional information to support your view.:

If elemental provisions are provided, then these should be limited as modelling methods are preferred.

Question 5

Other

If other, please specify.:

Less than 100

Please explain your response and provide additional information to support your view.:

The complexity of any elemental provisions have to be aligned with the threshold. For simpler provisions, a much lower threshold should be used. The approach outlined in the scoping report related to this is sound on the relationship of dwelling size to complexity of provisions.

For elemental provisions of reasonable complexity a low threshold under 100sqm should be applied.

Question 6

Yes

Please explain your response and provide additional information to support your view.:

We support allowances for services to be included in a 'whole-of-house' energy assessment and consider that it is reasonable to investigate. However, recommend that the appliances considered include cooking appliances, dishwashers, washing machines, dryers, pool and spa heaters.

The noted extent of regulated energy uses would leave approximately 30% of energy uses unmodelled, with renewable energy systems undersized compared to the full energy use of the dwellings and buildings.

If any of these appliances are not being provided in the building at the building permit stage, they should not be scoped out, rather a minimum efficiency requirement commonly available in the market efficiency should be used for calculations to provide a closer approximation of 'whole-of-house' energy use.

We support the NCC investigating and including allowances for lighting. We recommend that serious consideration be given to the use of strip LED lighting which has a much higher wattage than LED bulbs. Strip LED lighting can use up to 50 watts per meter. Some suggest that the longer the strip the lower the overall 'real power' per meter used. Never-the-less, strip LED lighting can very easily bring the lighting energy budget for a dwelling above the NCC requirements. Guidance on the impact of strip lighting, and how to calculate the LED strip lighting wattage is needed.

Question 7

A NatHERS compliance pathway which includes necessary DTS elemental provisions., An expanded and more detailed 'reference building' Verification Method., Whole-of-house 'tools', such as BASIX and the Victorian Scorecard., Other Performance Solutions.

Please explain your response and provide additional information to support your view.:

We support the need for stronger compliance pathways to be developed.

We support the NatHERS administrators' proposal to prioritise improving as-built certification; a whole-of-house approach to assessment and the provision for accredited assessors across jurisdictions.

As noted in Q1, addressing Compliance pathways should include on-site with mandatory verification and certification; including whole of house verification of air tightness; and two additional checks by the Building Surveyor, on draught sealing and insulation, with photographic evidence collected by the Building Surveyor, or alternatively an on-site expert for proving compliance (e.g. modified Clerk of Works approach).

In addition, the development of numerous pathways to achieve As-Built compliance that may have been committed to, yet not implemented has more likelihood of being achieved if addressed at all stages and by several methods. Having said this, they need to be clear and accessible, and in place from inception through to as-built. A pro-active approach preferable over a reactive one whereby enforcement is carried out.

Question 8

ranking - DTS elemental provisions:

ranking - A NatHERS compliance pathway which includes necessary DTS elemental provisions:

2

ranking - 'Reference building' Verification Method:

ranking - Other Performance Solutions:

1

None of the above:

No

Please explain your response and provide additional information to support your view.:

The Council Alliance for a Sustainable Built Environment (CASBE) is a collaborative alliance of Victorian councils committed to the creation of a sustainable built environment within and beyond their municipalities. Our focus is on applying widely accepted Ecologically Sustainable Development (ESD) principles to the built environment through the Victorian statutory planning system.

CASBE has developed the Built Environment Sustainability Scorecard (BESS) - an online tool for assessing the sustainability of development proposals at planning stage. BESS provides a consistent assessment methodology for CASBE's Sustainable Design Assessment in the Planning Process (SDAPP) framework – an approach adopted by numerous Victorian Councils. SDAPP and BESS both consider whole of building energy use, among other environmental issues, and encourage development applicants to achievement energy performance targets through commitments to certain energy efficiency / renewable energy strategies at planning stage.

BESS is provided on a subscription based service to council members, and is currently used by the development industry in 24 municipalities.

The BESS tool is currently the subject of an investigation by DELWP into it's suitability for use with a state ESD Policy.

Our currently accepted methods of demonstrating compliance in BESS includes:

- Completion of a BESS report
- Preliminary NatHERS Energy rating tool report that meets minimum NCC standards (BESS starts to awards points for an average NatHERS rating of 6.5 star or higher)
- In-built calculators
- Deemed-to-satisfy approaches
- Green Star Hand Calculation Method
- Alternative compliance option, such as written evidence of either use of natural ventilation or carbon monoxide monitoring device within Carpark, fully integrated and implemented through each phase of building life.
- Evidence of Lighting type/s used to achieve 4W/sqm.
- A report including specifications of the renewable energy system and energy calculations; and Floor plans showing location of the renewable energy system(s) as described.

- Site or Floor plans indicating location of designated electric vehicle parking location and charging infrastructure.

Performance solutions include reduction of annual energy consumption to > 10% below benchmark (NCC requirements) calculated using the in-built calculator or demonstrated via alternative modelling and uses both building fabric and building services inputs.

Question 9

Other

If other, please specify.:

NatHERS tools developed to have this functionality

Please explain your response and provide additional information to support your view.:

If Basix and the Victorian Scorecard are being considered as 'whole-of-house' tools to be referenced in the NCC, the BESS tool (bess.net.au) should also be considered. However, we consider that the NatHERS tools are the most appropriate to be used and referenced for this purpose.

The Scorecard, Basix (other than the simplified approach which should not be supported) and BESS use a similar approach of relying on NatHERS data inputs to complete.

BESS

BESS has comprehensive coverage of whole-of-house energy within the Energy category. It considers passive design and the performance of the envelope (through the inclusion of NatHERS data), energy efficient services and appliances, and renewable energy generation. BESS considers these aspects in combination to determine potential energy savings above benchmark and minimum standards.

Residential Energy Modelling - NatHERS ratings

For residential projects, preliminary modelling is expected wherever a claim is made that the dwelling will exceed the minimum requirements under the National Construction Code. For the purposes of sampling, dwellings can be grouped where they share similar thermal properties. The aim is to reduce reliance on mechanical systems to achieve thermal comfort in summer and winter - improving comfort, reducing greenhouse gas emissions, energy consumption, and maintenance costs.

Greenhouse Gas Emissions (GHG's)

Points are awarded when greenhouse gas emissions are >10% below the benchmark, as calculated by the in-built calculator or demonstrated via alternative modelling. The calculation uses both building fabric and building services inputs.

Peak Demand – instantaneous (peak-hour) cooling demand reduction of >25% achieved via improved insulation, glazing and shading (and calculated in NatHERS cooling load figure).

Points are awarded when the instantaneous (peak-hour) cooling demand been reduced by >25%, as calculated by the in-built calculator or demonstrated via alternative modelling. Peak demand is calculated based on the NatHERS cooling load figure. Reducing cooling loads (via measures such as improved insulation, glazing and shading) will deliver an improvement in the peak cooling demand.

Electricity consumption

Points are awarded when the annual electricity consumption is >10% below the benchmark, as calculated by the in-built calculator or demonstrated via alternative modelling. The calculation uses both building fabric and building services inputs.

Gas consumption

Points are awarded when the annual gas consumption is >10% below the benchmark, as calculated by the in-built calculator or demonstrated via alternative modelling. If no gas appliances are in use then this credit is 'N/A' and is automatically scoped out.

Wood consumption

Points are awarded when the annual wood consumption is >10% below the benchmark, as calculated by the in-built calculator or demonstrated via alternative modelling. If no wood appliances are in use then this credit is 'N/A' and is automatically scoped out.

Carpark Ventilation - To ensure the efficient use of energy, reduce total operating greenhouse gas emissions and to reduce energy peak demand in multi-residential and mixed-use developments.

Hot Water – system energy consumption >10% below benchmark.

Lighting – external and internal - efficient use and reduction of operating GHG emissions and peak demand, via use of external motion detectors and internal maximum illumination power density 4W/sqm or less (equates to 20% improvement on current NCC requirements).

Clothes Drying – energy consumption reduction of >10% below benchmark (combination of clothes line and efficient mechanical dryer).

The latest v1.60 of BESS has an updated Greenhouse Gas Factors used in energy calculations; and NatHERS Climate Zones have been updated for Victorian postcodes.

*The next version update v1.7.0 aims to create more combined mandatory credits in Thermal comfort (shading and double glazing), and a revised Peak demand credit.

Question 10

Yes

Please explain your response and provide additional information to support your view:

See above. This is our preferred approach, even though we own and operate a successful energy (ESD) assessment tool.

Question 11

Yes, renewable energy equipment, Yes, electric vehicle charging

Please explain your response and provide additional information to support your view.:

We support the requirement to include provisions for electric vehicle charging and renewable energy equipment, as well enabling the increased uptake of electric vehicles fuelled by renewable energy. We recommend that the ABCB requires EV charging infrastructure be adaptable for all EV types.

The MAV in partnership with ClimateWorks Australia and the Electric Vehicle Council have recently completed a project on how to facilitate this nationally. Recommendations include a National capacity building program; Council fleet transition plans; and actions to reduce capital cost barriers.

Currently the BESS tool encourages the installation of on-site renewable energy generation. Points are awarded when the solar power system provides 5% of the building's annual energy consumption.

Points are also awarded when facilities are provided for the charging of electric vehicles, with a minimum, one parking space should be nominated for electric vehicle charging, with appropriate signage and charging infrastructure installed.

The latest version upgrade of BESS, V1.6.0, released August 2019, has introduced a new solar photovoltaic credit for Class 1 developments where points are awarded when solar power is providing at least 30% of the building classes' energy requirements.

CASBE's strategic aspiration is for all new buildings to be carbon positive as soon as possible. To that end, we have incorporated minimum energy targets and stretch targets into our assessment processes to encourage the shift to a zero-carbon future.

Question 12

Please provide any additional information in the space provided.:

CASBE is a collaborative alliance of Victorian councils committed to the creation of a sustainable built environment within and beyond their municipalities. Our focus is on applying widely accepted Ecologically Sustainable Development (ESD) principles to the built environment through the Victorian statutory planning system.

CASBE member councils include:

Banyule City Council, Bass Coast Shire Council, Bayside City Council, Benalla Rural Council, Brimbank City Council, Darebin City Council, Frankston City Council, City of Greater Bendigo, Greater Dandenong City Council, Greater Geelong City Council, Hobsons Bay City Council, Hume City Council, Kingston City Council, Knox City Council, Manningham City Council, Maribyrnong City Council, Maroondah City Council, Melbourne City Council, Melton City Council, Monash City Council, Moonee Valley City Council, Moreland City Council, Port Phillip City Council, Stonnington City Council, Strathbogie Shire Council, Whitehorse City Council, Whittlesea City Council, Wodonga City Council, Wyndham City Council, Yarra City Council, Shire of Yarra Ranges.

CASBE provides a forum for the exchange of information, and ideas on innovation and best practice in Ecologically Sustainable Development (ESD). Our local, ground-up approach has resulted in collaborative local government led action and broad scale positive change to Victoria's built environment and a significant reduction to its consequent environmental impacts.

A key aspect of CASBE's work has been to facilitate the introduction of local planning policy that requires Environmentally Sustainable Development (ESD) design strategies to be considered by the community when undertaking development projects. The 21 councils that have a local ESD Policy are an indication of the success of CASBE's work in this area. Refer to the CASBE website for details on these policies.

A Climate emergency has been declared across the globe amongst organisations, governments and community, with CASBE member councils showing leadership in this area through declarations, zero carbon policies and the ESD planning policies mentioned above.

One of CASBE's current strategic goals is to achieve 'A Step Change in Impact'. CASBE recently committed to commence work on transitioning new buildings to beyond zero emissions (ie carbon positive) and identifying how planning can play a role in this.

CASBE supports a rapid transition to zero emissions buildings and precincts, and encourages the ABCB to develop building policy to back this objective.

Note: The views represented in this submission do not necessarily represent the views of all CASBE members individually.

File upload

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Commercial energy efficiency

Question 1

Yes

Please explain your response and provide additional information to support your view.:

Yes. The future climate will be different, and we will need to design for this. A similar approach should be taken for residential building classes.

Question 2

Yes

Please explain your response and provide additional information to support your view.:

Yes. Although we note that individual occupancies would need requirements to ensure that thermal performance in each SOU is acceptable (similar to the average and minimum NatHERS star rating that currently applies) given that JV3 works on a whole of building approach.

Question 3

Yes

Please explain your response and provide additional information to support your view.:

Yes. Ultimately the best verification method is based on actual performance.

However, how would this be enacted / governed, particularly for Class 2? In the end, where does the responsibility lie? Is it passed onto future building owners following completion of construction? If they have a NABERS commitment but don't follow through, how is this governed?

Question 4

Yes

Please explain your response and provide additional information to support your view.:

Yes. Thermal bridging can be a significant weak point in the thermal performance of the building. There are often many penetrations in the envelop of non-residential buildings. This should also be considered for residential buildings classes.

Question 5

Yes

Please explain your response and provide additional information to support your view.:

Yes. Vertical shading is commonly used and can be very effective in controlling heat gain. All effective external shading methods should be considered.

Question 6

Yes

Please explain your response and provide additional information to support your view.:

Yes, if their size affects the ability of the building to achieve the minimum performance requirement. The scoping study explains this well.

Question 7

Yes

Please explain your response and provide additional information to support your view.:

Yes. On-site renewables reduce greenhouse emissions. When greenhouse is the test, they should be allowed. However the thermal performance of the envelope should not be offset against renewable energy when considering energy use.

Question 8

Yes

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