

May 29, 2020

Roger Teale, Jude Munro AO, Stan Krpan  
Co-Chairs  
Building Victoria's Recovery Taskforce

Via email: [submissions.BVRT@delwp.vic.gov.au](mailto:submissions.BVRT@delwp.vic.gov.au)

**Re: Affordable, Available and Achievable – incorporating energy efficiency in private and public sector housing development**

Dear Mr Teale, Ms Munro and Mr Krpan,

The [South East Councils Climate Change Alliance](#) (SECCCA) is made up of nine local government councils to the south east of Melbourne. SECCCA councils span the metropolitan, peri urban and rural divide and have some of the fastest growing residential developments on the fringe of the metropolitan Melbourne. Together, SECCCA councils serve over one million residents. Through SECCCA, these councils collaborate to act on climate change. This action includes mitigation and adaptation projects and advocacy for the community.

SECCCA has developed and implemented several projects across our region to deliver energy efficiency, climate resilient, comfortable and affordable homes.

For low income households, SECCCA implemented the [Energy Saver Study](#) (ESS), a \$4 million program to provide energy efficient upgrades. (The ESS provided the blueprint for the Sustainability Victoria's Health Homes program.) SECCCA also implemented the [Residential Energy Efficiency Scorecard](#), an Australian-first 'whole-of-house' energy rating program.

For new homes, SECCCA undertook the [New Home Energy Advisory Service](#) (NHEAS). This project provided bespoke and detailed design advice to numerous households regarding how to achieve net zero carbon. Twelve of these households received an as-built verification of their homes, an air tightness test and a report quantifying costs, energy savings and experiences.

As the Building Victoria's Recovery Taskforce is concerned with social and affordable housing within recovery initiatives, and SECCCA strongly supports substantially increasing the uptake of energy efficient and renewable energy in the residential sector, we are pleased to submit the attached paper Net Zero Carbon Learnings and Recommendations for consideration by the Taskforce in its residential sector development program.

The paper sets out the learnings from the NHEAS project, which are underpinned by the knowledge garnered from the ESS and Residential Energy Efficiency Scorecard project. Fundamentally, the learnings demonstrate that energy efficiency for residential homes is available, achievable and most importantly affordable.

The learnings are consistent with those from Curtin University and the CSIRO [Mainstreaming Net Zero Energy Housing: Cost Analysis Report](#) in which SECCCA participated through the build of [SJD Net Zero Home](#). We have also communicated these findings to the Australian Building Construction Commission for consideration in its review of the National Construction Code.

It is critical that investment in social and affordable housing incorporates energy efficiency and renewable energy; these initiatives vastly improve resident's well-being by making homes easier to heat and cool and more pleasant to live in. We know that the building industry has access right now to the technology and practices that enable energy efficiency and renewable energy to be incorporated into social housing and that the technology and practices are affordable.

To help ensure success, we would encourage the Victorian government to work directly with industry, to build its capacity to deliver the initiatives. Also, while COVID stimulus measures can certainly 'kick start' investment in energy efficiency outcomes, policy reform is needed to ensure these outcomes become business as usual.

Our work has also identified that verification of compliance with energy efficiency and planning standards presents an opportunity to increase uptake of energy efficiency and renewable energy. We have discussed the potential for a national training and regulatory program to build capacity and significantly increase delivery of this service, again, working with industry. This aligns with the TAFE reforms currently being deliberated.

Working with the building industry to achieve net zero carbon homes, we have observed that the overwhelming response from builders is that these changes are affordable, available and achievable, and only limited changes to their building systems are necessary.

Thank you for your consideration of these suggestions. Please don't hesitate to contact me if you would like further information.

Kinds regards



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## **SECCCA NEW HOME ENERGY ADVISORY SERVICE NET ZERO CARBON NEW HOMES LEARNINGS AND RECOMMENDATIONS**

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From 2017 – 2020 SECCCA delivered the New Home Energy Advisory Service (NHEAS) which provided bespoke and detailed design advice to numerous households regarding how to achieve net zero carbon. Twelve of these households received an as-built verification of their homes, an air tightness test and a report quantifying costs, energy savings and experiences.

SECCCA's Net Zero Carbon Learnings and Recommendations have been developed using the results derived from the case studies conducted on these twelve households. The results are consistent with recent findings from Curtin University and the CSIRO [Mainstreaming Net Zero Energy Housing: Cost Analysis Report](#) in which SECCCA participated through the build of [SJD Net Zero Home](#). SECCCA has excluded some interventions (e.g. Anticon Insulation) that demonstrated lower paybacks.

### **Recommendation 1. Legislation is needed to mandate Net Zero Energy homes.**

The key barrier to the increased uptake of additional energy efficiency above the NatHERS 6 stars is a 'minimum compliance' approach by builders. The majority of builders only build to the minimum standard as a voluntarily increase energy efficiency ratings would put them at a competitive disadvantage. Legislation through the NCC is needed to provide the operating framework for builders to comply.

### **Recommendation 2. The National Construction Code emphasis should be on achieving net zero carbon now, not in 2030.**

A review of the current NCC Scoping Study suggests achieving net zero energy by 2030. The NHEAS project demonstrates how affordable and easy net zero energy is today.

Achieving NatHERS 7 Stars was demonstrated to be difficult and expensive for some homes due to poor orientation. Poorly orientated homes do not have the northern solar aspect required to easily reach 7 stars, where, for example, blocks have a north facing street frontage. In these cases, owners need to invest in expensive glazing or insulation products. Builders commented that for some homes/blocks of land it was simply not possible to achieve 7 Stars.

SECCCA recommends that a transitional approach is implemented, whereby a trajectory to NatHERS 7 Stars is created; for example, starting with 6.5 Stars mandated by 2025 and then 7 stars by 2030.

### **Recommendation 3. As built Verification and Certification is required, including air tightness testing**

To achieve net zero targets, as built verification and certification needs to occur. Options are currently proposed in the next NCC update. The Victorian Residential Efficiency Scorecard (VRES) has proved to be a valuable tool for assessing the whole-of-house energy use and as-built verification and certification. The star rating, also up to 10 (with 10 exceeding the energy needs of the home) provided a useful tool for participants to validate the upgrades they had made and how they could make further improvements if they did not achieve 10 Stars.

However, both NatHERS and VRES fall short on testing air tightness. During the NHEAS project, air tightness testing identified internal cavity doors, heaters, cabinetry, fans, corking, doors, windows, piping penetrations and joinery with significant air leaks. Participants were both surprised and disappointed at how poorly their homes were performing despite paying thousands of dollars on insulation and double-glazing upgrades only to have this effectively voided by air leaks. When it comes to home building shell, air leaks are an aspect many overlook. As the project demonstrated improving air tightness is easy to achieve and affordable with the right air tightness specifications and critical testing to determine performance.

### **Learning 4. Incorporating net zero carbon homes into the housing sector is easily achievable NOW**

The 12 case studies in this project demonstrated that the technology is available today to build zero carbon homes and they are affordable. NHEAS showed that zero carbon costs represent between 2-3% of the total build, including land (approx. \$20,000 for a 30 square home in a growth area). Paybacks are around 8 years however, coupled with a green loan and zero power bills, can result in a 4 year payback (through a saving of \$5,000 per year on energy bills and interest rate reduction).

## **Learning 5. Homes will be resilient to climate change, particularly extreme weather events**

Overwhelmingly, all those that implemented changes according to the NHEAS program advice could not have been happier. Participants all enjoyed having a cool house during summer and warm house during winter without having to turn on space conditioners as much, particularly during extreme weather events. It is estimated that with an airtight home of <3.5ACH (air exchanges per hour at 50 Pa of pressure) heating and cooling requirements are reduced by 70% compared to homes with 10ACH or greater.

## **Learning 6. Health will be improved**

The NHEAS project demonstrated that once specifications for air tightness is made to reduce heating and cooling requirements, then there is a risk of over tightening a home. To rectify this a Heat Recovery Ventilation (HRV) System is required. The added benefit of reducing heating and cooling requirements (through improving air tightness and installing an HRV systems) is that the heating and cooling units can be downsized. This is because less heating and cooling is need and the HRV systems circulates the air to all areas of the house. These changes in technology use were demonstrated to be affordable and near cost neutral to current trends of using evaporative cooling and ducted gas heating.

The benefits of a Heat Recovery Ventilation System to health from ensuring fresh air is circulated around the home is well known. It enables smoke, dust, VOC's, pollen, CO2 and other pollutants to be filtered out of the breathable air.

## **Learning 7. Other benefits to a Net Zero Carbon home – it's a win all round**

Participants commented that beyond the energy savings homes felt more comfortable, quieter, were less dusty with less cleaning and less bugs. These benefits along with the financial savings, carbon reduction and health benefits result in a high performing and desirable home.

The outlook for these homes now and in the future is only positive. SECCCA makes the following technology neutral recommendations to achieve a net zero carbon/energy home for all new homes immediately:

- 1. Energy source 100% renewable energy (eg. on-site solar or off-site GreenPowerpurchase)**
- 2. External shading for east and west windows**
- 3. Roof insulation minimum R2.5 walls and R5 in the roof**
- 4. Glazing minimum R0.3 and U value 3.3 windows & doors**
- 5. Achieve a building envelop airtightness value of less than 5ACH at 50pa of pressure under tests conditions**
- 6. Achieve an air ventilation rate of 1ACH every 2 hours (under natural air exchange conditions). Including the recovery of heat to 90% in exchanged air and filtering of air to M5 / G4**
- 7. Three additional onsite inspections - Pre insulation, Pre plaster & Post occupancy: on-site as built verification and certification (such as VRES)**

In regard to lifting the NatHERS star rating SECCCA believes it could remain at 6 Stars in the short to medium term; however, homes must incorporate ALL of the above recommendations. They cannot be traded off with other alternate interventions in order to achieve 6 stars. This will likely result in some homes achieving higher than 6.0 stars.

In time the NatHERS star rating could be lifted further, with a trajectory 7 Stars by 2030. However, this may not be necessary if the policy objective is to achieve operationally carbon neutral or positive homes - this can be achieved through a balance of affordable energy efficiency upgrades and solar installations.

For more information please contact Dominique La Fontaine on 0428 455 005 or email for the full report [dlafontaine@seccca.org.au](mailto:dlafontaine@seccca.org.au)