

# Passive House Institute New Zealand

*Te Tōpūtanga o te Whare Korou ki Aotearoa*

## HIGH-PERFORMANCE BUILDINGS AT SCALE – QUESTIONS & ANSWERS



**Chris Higgins, Green Building Planner for  
the City of Vancouver**

**Emma Osmundsen, Managing Director  
Exeter City Living Ltd.**



**Hosted by Kara Rosemeier, PHINZ**

*With special guest Alex Baker, Sustainability Programme Manager at Kāinga Ora*



Life after Covid-19 will not be the same. Business-as-usual has become mission impossible, can we make this a blessing rather than a curse? Our Covid-19 response in Aotearoa NZ was the envy of the world. Sadly, our building practices are not.

We should not continue to build in a way widely recognised as inadequate for the provision of human habitat. Whatever we do to future-proof our buildings will require a leap rather than baby-steps, as we have a lot of catching up to do.

We have a growing number of designers, builders and professionals in Aotearoa NZ who have clearly demonstrated the feasibility of raising the bar. What does it take to scale up these efforts; to make every building a truly healthy and comfortable place to live, work and play?

To show us the way, PHINZ invited two agents of change from places which have overcome the inertia and introduced high-performance at scale:

- **Chris Higgins**, Green Building Planner for the City of Vancouver, and
- **Emma Osmundsen**, Managing Director Exeter City Living Ltd.

Vancouver is on a path to [Zero Emission Buildings](#) that has very quickly resulted in an incredible uptake of Passive House across the board. Exeter started with Passive public housing and quickly moved on to delivering [all types of public buildings](#) to the Passive House standard. How did they make it happen?

Is Aotearoa NZ a special case, though? For a transferability check, we have also invited **Alex Baker**, Sustainability Programme Manager at [Kāinga Ora](#), to join the panel. Kāinga Ora is the New Zealand Government's Urban Development Agency and the largest public housing supplier.

The session was not recorded, however, the Question and Answer session is transcribed in this document to make the valuable lessons and advice available to all.

On the following pages;

- CH - Chris Higgins, Green Building Planner for the City of Vancouver
- EO - Emma Osmundsen Managing Director Exeter City Living Ltd
- AB - Alex Baker, Sustainability Programme Manager at Kāinga Ora
- KR - Kara Rosemeier, PHINZ

**Speaker**      **Question & Answer**

KR      *Can you outline your progress with building high performance buildings at scale in Exeter?*

- EO
- We have been developing certified Passive Houses for the City of Exeter for 12 years – so we were early pioneers of the standard in the UK.
  - As a local authority, we started our journey with affordable and social housing portfolio. We started with baby steps back in 2008, with just three Passive House flats.
  - Now we have a pipeline of over 1000 passive houses, and we are widening beyond residential buildings.

KR      *Can you outline your progress with building high performance buildings at scale in Vancouver?*

- CH
- Vancouver has been addressing high performance buildings for about 10 years.
  - Vancouver's 'Zero Emissions Building Plan' requires nearly all new buildings required to emit zero emissions in their operation by 2025. Existing buildings have the same goal by 2050.
  - Incentives for buildings pursuing PH certification: 5% floor space bonus for multi-family developments with 5+ dwellings; \$23K grant for low rise buildings; 16-18% floor space exclusion for 1&2 family homes.
  - Vancouver has its own building code. Requirements for new residential 1 to 3 Storey (by Jan 2022): Heating limit 20kwh/m2/a using Hot2000, Zero emissions space and water heating (electric).

KR      *What were the facilitating factors or persons in getting Vancouver where it is today?*

- CH
- There were grand plans, the [Zero Emissions Building Plan](#) was part of the Renewable City Strategy, and that was part of the Greenest City Action Plan. Each of them outlined decade by decade the transitions that needed to take place.
  - Most councillors and politicians were supportive of the plans.

**Speaker**      **Question & Answer**

KR      *What were the facilitating factors or persons in getting Exeter where it is today? Did you have grand plans as well?*

- EO
- More modest process, without grand plans. Started with smaller projects and actions. The initial idea was to tackle fuel poverty.
  - Gradual organic growth, building confidence in the supply chain.
  - The greatest advocates for passive house were the residents. Occupant feedback was very important to encourage more projects to happen.

Audience      *Could you explain what 'floor space exclusion' is?*

CH      You can basically build a larger house if it is a certified Passive House.

KR      *What are the biggest obstacles to overcome when trying to take high performance buildings to scale?*

- EO
- For people new to Passive House, the contractor and construction delivery can be challenging. But this is changing quickly; recently contractors are realising that the demand for low energy/low carbon buildings is increasing, and they are far more willing, prepared and open minded due to the potential commercial benefits.
  - We have seen a shift in the cost of passive house. 12 years ago, there was a 20% premium. Now, we can deliver passive house at minimal or no cost uplift.
  - Cost versus value argument. Buildings have lower maintenance costs as well as lower energy costs for their lifetime. This more than compensates for any construction capital uplift.

KR      *What is the cost situation in Vancouver, and the role of the incentives you presented?*

CH      In Vancouver, there is still a premium around 3 to 8%. The additional floor area bonuses help cover this premium. Costs are going down, as more components are now available in the market.

**Speaker**      **Question & Answer**

KR      *What is holding us back in Aotearoa? Why are high performance buildings not the norm here?*

- AB
- In New Zealand, there are many issues putting pressure on the housing market. Current unaffordability is due to many factors, including the tax system, financial literacy, infrastructure, banking, etc.
  - Residential construction is dominated by quite small players. Builders are pressured to deliver at minimum cost and as fast as possible. General understanding is that the main problems in the construction industry nowadays are related to consents and unaffordability.
  - General public has a lack of awareness about the environmental and health issues in the built environment. Low level of knowledge to inform decisions about upfront cost versus long-term savings.
  - Kāinga Ora has plans to improve its standards over the next few years and give more attention to environmental and health issues in the built environment.
  - Legislation is not an effective tool for driving change like this. It can only be used to reinforce a change that must be catalysed in other ways. Need to focus on building awareness, desire and knowledge within the sector of what, why and how.

KR      *Are there any lessons from Vancouver that New Zealand could apply here?*

- CH
- Yes, one thing that Alex mentioned is also similar here in Vancouver: our builders mostly complain about permits and affordability, they are not concerned about the climate crisis, or the lack of insulation, unhealthy indoor environments. So, the incentives were very helpful to encourage passive house here.
  - Also, we have a carbon tax that allowed these programs to happen. Carbon tax funds are used for incentives for high performance buildings, education, industry training, etc.

**Speaker**      **Question & Answer**

KR      *Are there any lessons from Exeter that New Zealand could apply here?*

- EO
- If we can do it, New Zealand can certainly do it!
  - There are many changes happening lately with the growing interest in the climate change movement. Younger generations, and in some cases older ones, too, are more interested in the environment and demanding low carbon buildings. This environmental interest opens up the opportunity for a resurgence in younger people joining the construction industry, if it shifts itself to delivering Passive House or other socio-environmental standards. This would help address a current shortage of talent in the industry and the problems face by an aging workforce.
  - I think modular construction could be part of the solution, helping to improve quality while lowering costs and speeding up delivery.
  - We learned a lot of the years, we simplified how we build, de-risked construction techniques, and this helped reduce costs as well.
  - Passive House attraction for us is QUALITY, the guarantee of performance (reliant), great health benefits, very happy residents, (reduced or nil rent arrears), reduced maintenance and repair costs, easy solution for achieving net zero carbon, I could go on and on... Passive House people also tend to be lovely!

Audience      *Do you think that contractors are keeping PH costs above the 'norm'?*

EO      Some contractors will tend to add a cost premium due to their perception of risk building to the Passive House standard and sometimes due to perceived programme prolongation.

Audience      *These has been a US-base study showing that social housing tenants are not able to maintain HVAC systems or replace filter as per requirement, gradually losing enthusiasm about Passive House. Has it been the case with your experience there in the UK?*

EO      Residents have got the habit of fiddling! we have evolved our designs to ensure that our MVHR systems operate 24/7 so residents do not switch them off. We have easily accessible filter access so residents can change them or our housing officers can change them whenever they undertake our 6 month visits.

**Speaker**      **Question & Answer**

**Audience**      *So over 12 years period, were you able to develop some sort of SOPs for new tenants coming into the "PH family"? or some sort of welcome video that shows them what to do from the onset?*

**EO**

- Over the years we have tended to educate our residents less and less as Passive House is intuitive and residents can adapt really quickly.
- We have a handbook but increasingly this is more an information book allowing people to understand their home as opposed to an instruction manual. Residents do not need to anything special other than press a boost button if they have a strong curry take out or similar need for a fresh air boost and want to clear the indoor air more. The rest is intuitive, they find they do not need to turn their heat on and only open their windows in the summer if they want to bring the indoors in.
- Energy savings for PH vary - often due to occupant behaviour. Data is still small so this can distort results. We have a study on some of our early projects and I would be happy to share.

**Audience**      *How much is the PH standard being incorporated into Kāinga Ora houses?*

**AB**      Not much at the moment. But with the Healthy Homes Guarantee Act, there is an exemption from having to provide additional fixed heating sources if the building is a certified Passive House. So, in this case Passive House might be relatively cost neutral, and we are investigating this.

**Audience**      *Emma, how are you getting your thermal mass inside the houses? And is the embodied energy of the thermal mass being looked at?*

**EO**      Clay blocks and concrete are being used for thermal mass. We are looking at building more with timber, but in the UK there are some barriers to this approach for high rise because of fire protection, which we are trying to overcome.

**Audience**      *I think the benefit for Vancouver is that Chris stays in his position and persists in ensuring Passive House could be implemented. Without key people willing to pursue such goal for a long-term period, it is difficult for something to eventually to catch on..*

**CH**      Yes, I agree people need to stay in roles to see change through

**Speaker**      **Question & Answer**

Audience      *Do you use off site prefabrication for your buildings?*

- EO
- Not at the moment, but we are very interested in applying prefabrication in the future as we upscale. Certainly, there is a lot of opportunities for modular construction.
  - We have been using modern methods of construction, with clay blocks which were quite fast and effective. We are using more thermal mass because of our future climate predictions.

KR      *What would you ask our panellists to help upscale the uptake of high-performance houses in New Zealand?*

- AB
- Information is key for us at the moment, data from occupant experience would certainly be useful.
  - Information about HVAC systems and setting them up in ways that tenants cannot modify them.
  - It would be interesting to learn from your process of engaging with suppliers.
  - The whole of life evaluation, and the long term benefits from resilient and high-performance buildings.

Audience      *Emma and Chris, is the average person on the street aware of passive house or is it still perceived as niche?*

EO & CH      Awareness has been growing in the building industry. But general knowledge in the broader community is still quite low.