

INDUSTRY INSIGHTS

MEMBER TO MEMBER ARTICLE

Energy Efficient Building: What does it really mean?

It takes more than energy-efficient appliances and low-flow taps to create a truly efficient home. The capability to build and design a home that is warm, healthy, sustainable, and can be effectively and affordably heated and cooled all year round is out there—but not commonly found in New Zealand.

In November this year, the insulation requirements for homes built in Central Otago will double. While this sounds like good news, it also provides some alarming insight into how poorly our current code-compliant homes perform.

So, can you assume that any home that meets the Building Code will be warm and efficient? And will a builder or architect provide measurements of energy efficiency as part of the build and design? Unfortunately, the answer is no to both questions.

There is an incorrect assumption that the Building Code is the baseline, and any improvements on that, no matter how small, give you an energy-efficient home.

Don't rely on the Building Code to keep you warm at night

Despite what a building company's marketing hype may tell you, energy-efficient home building requires more than adding in a few extra specs. In my view, the ability to achieve an energy-efficient home involves modelling and measurement. But this is not the approach the broader industry currently takes. Instead, energy efficiency is measured against a baseline that looks at how things were done in the past. And it's not hard to improve on that.

For those of a certain vintage, your baseline will most likely be the cold house you grew up in. Where you were so cold overnight, you wore all your clothes to bed and, each morning, awoke to water dripping down the walls. A home where it was only possible to keep one room warm while the rest of the house was freezing as drafts crept in under doors and through windows. If this is your baseline, then yes, any new home will be an improvement.

The Building Code vs. Measured Performance

While I acknowledge the importance of a Building Code in our industry, I question its effectiveness in encouraging warm, healthy, high-performance homes.

Currently, the Building Code isn't based on a performance standard for energy efficiency. It doesn't address the climate, aspect, or sunshine hours (or lack of sunshine hours) of the site. It's not based



on thermal modelling or building performance. The current building code system evaluates how a home loses heat, however, there is no temperature standard for the home as a whole. It does not consider how much heating energy a home needs to stay at the desired 20-degree temperature. In effect, the Building Code stipulates your home needs insulation but does not address the specific way that should work for each home and the environment in which it sits.

This would be the equivalent of the car industry having no crash test ratings for vehicles. If you buy a new car and the dealer gives you the vehicle's safety rating, you know this is based on measurable and specific safety standards. The car's safety performance isn't simply based on how much better this vehicle performs against cars built forty years ago.

This is why there needs to be a different relationship between the Building Code and energy-efficient homes, one that is correlated to how the home performs. The Building Code in New Zealand is performance-based when it comes to structure, weather tightness, durability and a bit of ventilation. However, there is no building performance standard for energy usage. There is no code that says your home is required to be warm or healthy.

However, there is plenty of marketing that says your home built to code is warm and healthy.

Greenwashing warm homes

I'm sure everyone is familiar with greenwash, where good practice becomes overshadowed by good sales. We now see that happening with energy-efficient housing. LED lights, low-flow taps, energy-efficient appliances and the occasional use of insulated slabs are now touted as energy-efficient construction.

The heart of an energy-efficient home is more than fixtures and appliances or giving you the feel-good factor.

Here are five critical elements that should be integral to building and designing a true energy-efficient, high-performance home.

Thermal modelling

This will tell you if the home will be prone to overheating based on its position and aspect. You will be able to identify if the home will require an excessive amount of energy to keep the entire home warmed to 20 degrees.

Airtight

Your home needs to be airtight if you want it to perform well. Incorporating airtightness into the build keeps the inside air from mixing with the outside air in an uncontrolled manner.

Ventilation

Your home needs a ventilation system so that the air coming in and out of your home only happens when you allow it. You only have to open a window when you choose to invite the outside in.

Framing

An energy-efficient house is constructed differently, and this begins with framing. An energy-efficient, thermal home incorporates framing that is constructed to mitigate thermal bridging.

Insulation

Lastly, your home needs to be properly insulated, which thermal modelling will also address. How impactful is this? Based on a standard house, correct insulation could see your heating energy requirements reduce from 220kw/m²/annum to 35kw/m²/annum.

And this is only the beginning. In other parts of the world, we are seeing exceptional results in high-performance home building. This provides occupants with an incredible quality of living where it is possible to live warm and healthy year-round without overheating in summer or waking up cold in winter.

Dennis Dowling is the founder of DCD, a Queenstown-based construction company. DCD builds one-of-a-kind homes that change lives, each one an exceptional example of thermal performance, beauty, and lasting value. DCD is responsible for some of Central Otago's most beautiful and energy-efficient homes, including 2021's Regional Supreme Winner, Te Toka.