



Usage and uptake of engineered wood products in New Zealand

Use of engineered wood products has grown significantly in recent years but there are barriers in the way of its greater use. With a need for New Zealand to move to net-zero carbon construction and make better use of our timber resources, there are potential steps that policy makers, regulators and manufacturers can take to remove the barriers holding these products back.

To better understand EWP use in New Zealand, BRANZ surveyed building industry members to find out:

- what EWPs are being used and for what applications
- what are the barriers to their increased use
- how EWP uptake can be increased.

SUMMARY

Based on the survey results, it was found that the main themes around the increased use and uptake of EWPs in New Zealand were:

- cost
- availability
- regulation
- information
- education.

The need for more information and education were the most commonly cited ways of reducing barriers and increasing the use and uptake of EWPs throughout the New Zealand building landscape.

A comprehensive understanding of the environmental impacts of EWPs is also necessary to understand the effects of including these products for building projects.

RECOMMENDATIONS

- Provide more information, education and tools to increase the understanding and use of EWPs. This should include detailed case studies of buildings that use a significant amount of EWPs to show their impact on design, cost and performance.
- Collect and distribute more comprehensive data on the economic and environmental impacts of EWPs. Give more information about their carbon footprint and applications in low-carbon construction.
- Work towards enhancing cost-effectiveness through more manufacturers in New Zealand, greater product availability or an easier pathway for the use of imported EWPs.
- Update existing standards, Acceptable Solutions and Verification Methods to incorporate EWPs and develop clear compliance pathways.

ABOUT EWPs

Engineered wood products (EWPs) are appearing more frequently in our buildings, from large-scale structural elements through to non-structural and decorative components. EWPs include laminated veneer lumber (LVL), cross-laminated timber (CLT), plywood, particleboard and other composite wood-based products.

As building materials, they offer many advantages from structural strength to a lower carbon footprint that can help as New Zealand moves to a net-zero carbon economy. Many EWPs are produced in New Zealand, providing jobs and investment. While their use is increasing, some industry practitioners say they have a greater potential that is not being achieved.

USE OF EWPs

Respondents were asked “What percentage of your projects or work over the past 12 months have included a significant amount (at least 50% of materials used) of EWPs?” The highest response numbers involved EWPs in the main building structure (Figure 1).

Most respondents use EWPs to replace solid timber (often within NZS 3604:2011). The second most common replacement was for steel members and framing. EWPs are also replacing plasterboard and fibre-cement panels in bracing. Façade systems and cladding such as weatherboards and bricks were cited as other opportunities for using EWPs.

LVL was the most preferred EWP by a clear margin, followed by glulam, plywood and other timber-based panel products. Participants who chose ‘Others’ mentioned structural insulated panels (SIPs), truss systems, recycled timber products, engineered flooring products, bamboo products and prefabricated panel systems.

Over half of respondents reported a noticeable increase in the volume of EWPs used in their projects or work over the past 3 years.

Respondents clearly thought that this increased use of EWPs would be beneficial (Figure 2).

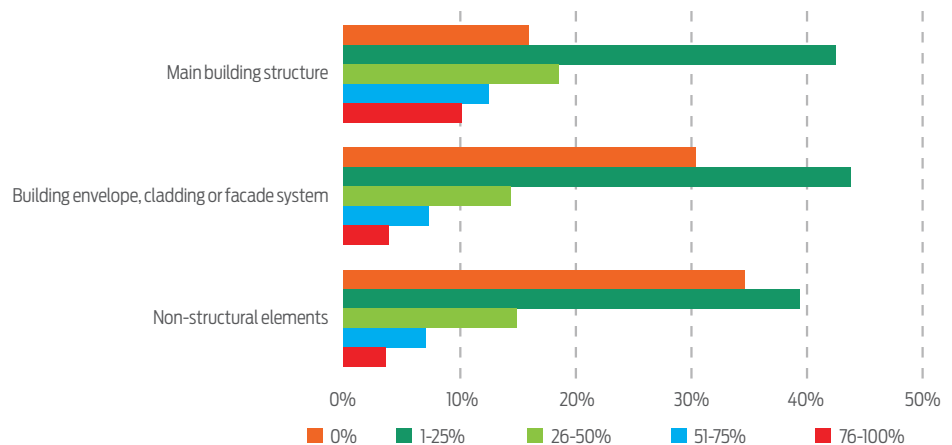


Figure 1. Percentage of EWPs used in projects.

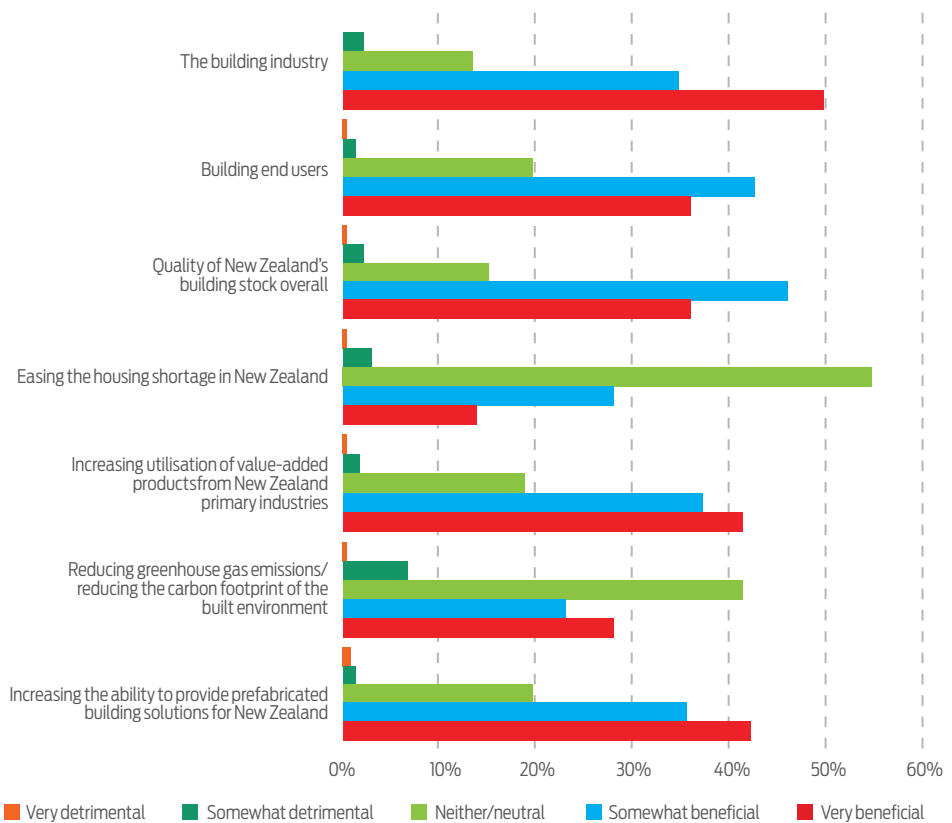


Figure 2. Assessment of how beneficial or detrimental increasing use of EWPs in New Zealand construction would be for different areas.

The survey

An online survey with 17 questions, using SurveyMonkey, was open throughout February 2019. An estimated 6,000 emails were sent out, including through Engineering New Zealand technical groups such as the Timber Design Society. An estimated 70,000 Build magazine

readers would also have seen an advertisement about the survey. A total of 474 surveys were completed, giving an approximate response rate of 0.6%.

Of the 474 respondents, 42% were designers, 28% were builders, 15% were engineers and 13%

were local government staff. Others included EWP manufacturers, quantity surveyors and people from education, building product supply and other manufacturing. More than three-quarters of respondents had been working in their current sector for more than 10 years.

ADVANTAGES AND DISADVANTAGES OF EWP'S

Over 80% saw advantages with EWPs in structural performance and speed of construction, and almost two-thirds saw advantages in ease of design and building aesthetics.

Performance, seen as the greatest advantage, included:

- stability, increased strength and spanning ability
- allowing for use of materials beyond those in NZS 3604:2011 Timber-framed buildings, which could result in less reliance on specific engineering design
- high-quality products resulting in better-quality buildings
- consistency of product manufactured in a controlled environment (including use in prefabricated units) and delivered to site dry, dimensionally accurate
- reduced waste
- lighter weight of members and the overall building
- simplicity of use and installation, increased speed of construction, simplification of other trades on site
- ability to change things on site.

PERCEIVED BARRIERS AND SOLUTIONS FOR INCREASED UPTAKE

Close to 50% of respondents agreed that there are barriers to the use of EWPs in New Zealand. Fewer than 15% disagreed.

These were seen as the main barriers:

- Lack of knowledge - about the products and how to build with them.
- Cost - not just product cost but also increased design time and costs for achieving Building Code-compliant designs. Lack of quantity surveyor knowledge and general uncertainty around EWP costs may result in higher cost estimates that could drive designers and clients away from EWP solutions.
- Regulation and compliance - specifically a lack of clear compliance pathways and regulatory guidance.
- Availability - specifically a limited number of manufacturers, limited stocks held by suppliers and significant lead times required for some materials. This barrier was frequently mentioned in regard to cross-laminated timber (CLT).

For increased uptake of EWPs, the industry must have confidence that they will perform in the long term, be cost-effective and result in solutions that will comply with the New

Zealand Building Code. The survey identified that the critical needs in enabling this are:

- increased product information, design aids and guidance
- demonstrated cost-effectiveness
- material availability and specification
- Building Code compliance documents and regulatory incentives.

One question considered which specific action(s) may be useful incentives (Figure 3).

Product information

In terms of product information, design aids and guidance, specific comments included:

- educating building owners about the benefits

of using EWPs and providing examples of comprehensive project costs

- educating industry about EWPs, assessing their cost-effectiveness and understanding compliance pathways
- upskilling builders because the workmanship may not be acceptable in some instances
- making available more specific information about material properties, fire and durability and acoustical performance, penetration requirements and installation details
- providing more online design aids, tables and calculators so that a range of professionals (not just engineers) can specify EWPs

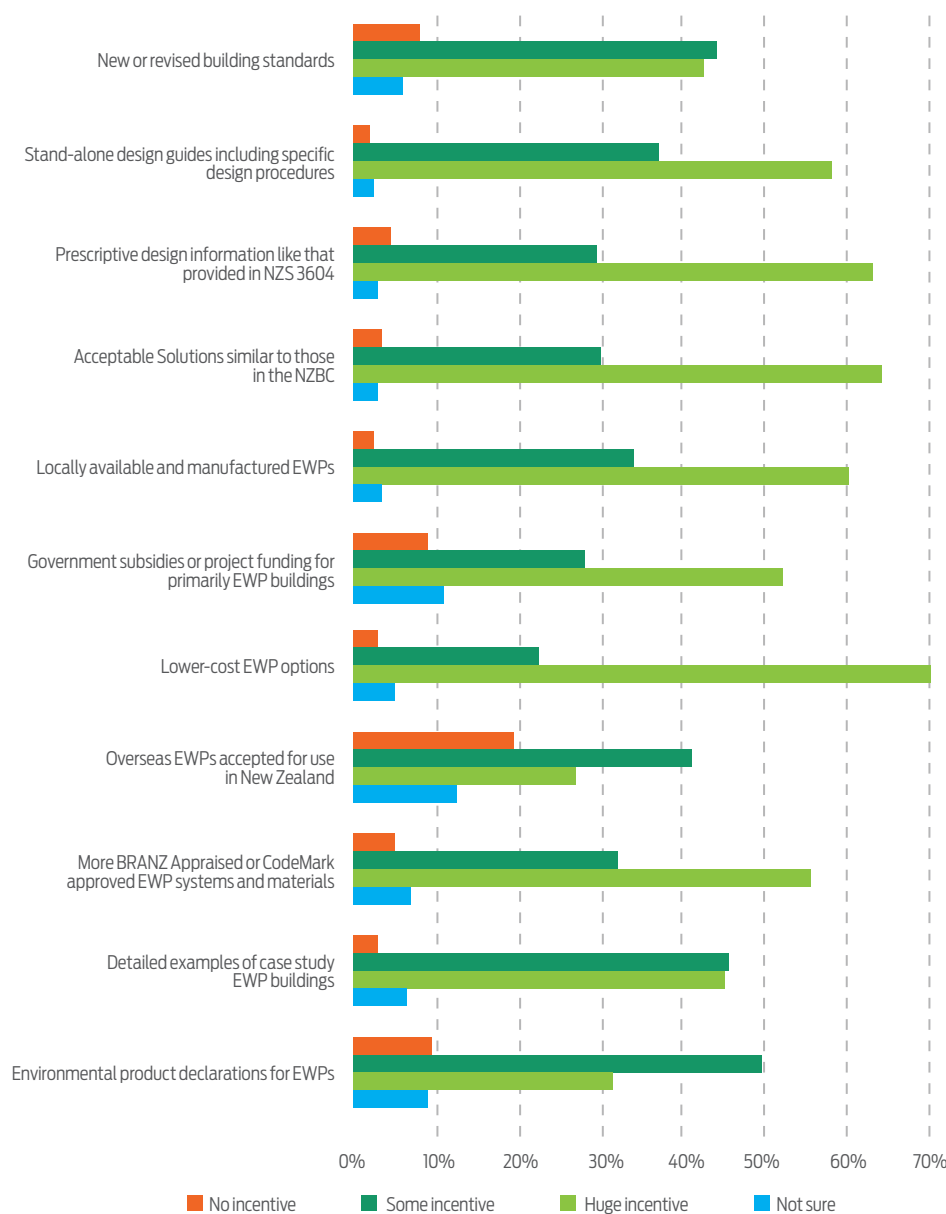


Figure 3. The perceived usefulness of incentives for greater use of EWPs.

- projects can be held up and costs increase when an engineer must be consulted
- providing detailed case studies giving examples of how EWPs can be used in Code-compliant designs, including costing
- providing guidance that supports better understanding around regulatory acceptance and what building consent authorities require - BRANZ Appraisals or CodeMark certifications would be helpful.

Demonstrated cost-effectiveness

Cost was clearly seen as a primary driving factor in enabling the use of EWPs. While many said lower and more competitive pricing would improve uptake, so would better information on how these products can save money due to stability, consistency and faster installation, even though the upfront costs may appear to be greater.

Cost, design understanding and product availability are closely interrelated and must be addressed simultaneously. Higher costs for EWPs may be the result of lack of options, limited manufacturers (and therefore competition) and limited understanding about how they can be used. Changes throughout the building system are key to moving forward with EWPs and creating more-effective competition for the steel and concrete sectors.

Material availability and specification

CLT and oriented strand board (OSB) were quoted as products that could be very useful in the New Zealand building industry but

Asked “Would you be more likely to recommend or work with EWPs if there was more information available on designing and building with them?”, over 78% agreed that the information would be useful for themselves or for others.

that had limited or inconsistent availability. Solutions to this may include more manufacturers or an easier path for imported Code-compliant materials to be used as long as New Zealand Building Code requirements can be met.

Continued development of these products would also be useful. For example, some said that, for longer spans, currently available EWPs require greater depth compared to steel.

Building Code compliance documents and regulatory incentives

Government support of EWPs would potentially help gain momentum to develop a large-enough demand to grow a larger EWP industry. One step towards this could be educating government, including central government and councils, so that compliance pathways for EWPs can be understood by all and easily implemented.

A standard that covers the range of EWPs would help determine what councils should require as well as identifying some of the

limitations of these products. More compliance information was definitely seen as needed. Inclusion in the standard being updated, NZS 3603:1993 Timber structures standard, was seen as a positive step.

Environmental and sustainability information should be promoted extensively to the point of requiring it as a consideration for consenting.

There were many calls for prescriptive methods for using EWPs to avoid having to use engineers and to specifically include EWPs in NZS 3604:2011 alongside more information on standard detailing and connections.

More information

BRANZ Study Report SR453 *Usage and uptake of engineered wood products in New Zealand*

