Timber, YOUR BUILDING CHOICE

New Zealand has an unbroken tradition of timber use in housing. This tradition has served us well and it will continue to do so for the foreseeable future, providing a sustainable, comfortable living environment.

Whether you are building or renovating, you have several choices of materials. The choice you make will have implications for the environment, health and safety and ease of use. Here is why you should choose timber for your project.

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RENEWABLE RESOURCE

Almost all New Zealand timber used in construction is sourced from sustainably managed plantation forests and not from protected natural indigenous forests.

New Zealand's plantation forest resource is expanding as harvested trees are replaced and new land is planted.

CARBON STORE

New Zealand's forests, including plantation forests absorb and store CO^2 from the atmosphere.

Timber used in construction and other uses stores carbon for the duration of its life which can be well in excess of the 50 year minimum service life of a house as required under the New Zealand Building Code.

Competing materials such as Steel and Concrete are net emitters of CO^2 into the atmosphere.

The following table provides an indication of the amount of Carbon stored against the amount of Carbon emitted over various different examples of House construction and also provides a conversion into what this equates to in terms of distance that can be travelled in an average car.

Option	1	2	3	4
House Size	200m^2	200m^2	200m^2	200m^2
Floor	Timber	Timber	Concrete	Concrete
Frame	Timber	Timber	Timber	Steel
Windows	Wooden	Aluminium	Aluminium	Aluminium
Cladding	Timber Weatherboards	Timber Weatherboards	Brick Veneer	Brick Veneer
Roofing	Long Run Iron	Long Run Iron	Long Run Iron	Long Run Iron
Decking (30m^2)	Timber	Timber	Concrete	Concrete
Carbon Emission (store)	(-20.68 tonnes)	(-17.28 tonnes)	18.73 tonnes	32.77 tonnes
Vehicle Usage Equivalent	103,390km (saved)	86,390km (saved)	93,660km	163,860km

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CARBON STORE - continues

So the difference between option 1 and 4, is the equivalent of driving 267,250kms in an average family car, or 7 return journeys from New Zealand to London.

The Net Carbon emitted from construction Materials produced in New Zealand is:

Treated Wood	-228 kg/m^3
Glue Laminated Timber	-168 kg/m^3
Reinforced Concrete	182 kg/m^3
Structural Steel	8117 kg/m^3
Aluminium	6325 kg/m^3

(source: Timber Design Guide, edited by Prof A Buchanan, University of Canterbury)

Every cubic metre of wood used as a substitute for other building materials, such as steel, aluminium, concrete or plastics, reduces CO^2 emissions in the atmosphere by an average of 1.1 tonne CO^2. If this is added to the 0.9 tonne of CO^2 stored in wood, each cubic metre of wood saves a total of 2 tonne CO^2.

(source: CEI-Bois, Brussels)

INSULATION

The New Zealand Building Code requires houses to comply with thermal insulation standards.

Timber framed construction methods have superior thermal insulating qualities to competing products because of its lower thermal bridging properties.

Timber also has a lower temperature gradient profile thus reducing condensation issues that are associated with steel.

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DURABILITY

Modern preservatives provide timber with protection against the effects of moisture and insect attack balanced with minimal use of chemicals.

Timber does not rust.

ELECTRICITY

Timber is a natural electrical insulator, especially when dry as is the norm in modern house framing.

Steel, if in accidental contact with a live source of electricity is a serious hazard to life.

FIRE

Even though timber burns, its contribution to total fire load in a burning house is very small compared to the load from flammable building contents such as furnishings.

Timber remains dimensionally stable and retains structural strength until the cross section has been considerably reduced whereas steel will suffer rapid temperature rise and loss of strength when exposed to fire.

CANTERBURY EARTHQUAKE

On 4 September 2010 the Canterbury region experienced an earthquake of magnitude 7.1

a. In general the housing stock, predominantly of timber framed construction, performed well with little structural damage caused by ground shaking.
b. The most significant structural damage to housing that was experienced was due to liquefaction of soil causing differential subsidence and/or lateral movement of foundations
c. Overall, pile foundations were able to withstand the effects of liquefaction better than concrete slab foundations. Pile foundations with timber framed flooring were able to cope with differential subsidence and lateral movements better than concrete slabs.

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EASE OF USE

Timber has been the building material of choice in New Zealand from the earliest days of human settlement. The qualities that have enabled it to retain this preferred position include:

- Ready availability
- Ease of use in terms of cutting and fixing
- Good strength to weight properties
- Handling – doesn't get too cold to handle in winter or too hot in summer
- Simplicity where building alterations are made
- Nationally recognised standards for use
- Cost effectiveness
- Aesthetically pleasing
- A natural product

New Zealand Timber Industry Federation Inc
PO Box 308, Wellington 6140, www.nztif.co.nz