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with wpma Wood Processors & Manufacturers Association of New Zealand

Developing an Association Environmental Product Declaration for the Wood Processing Industry

Verified and credible environmental impact data for NZ produced timber and engineered wood products

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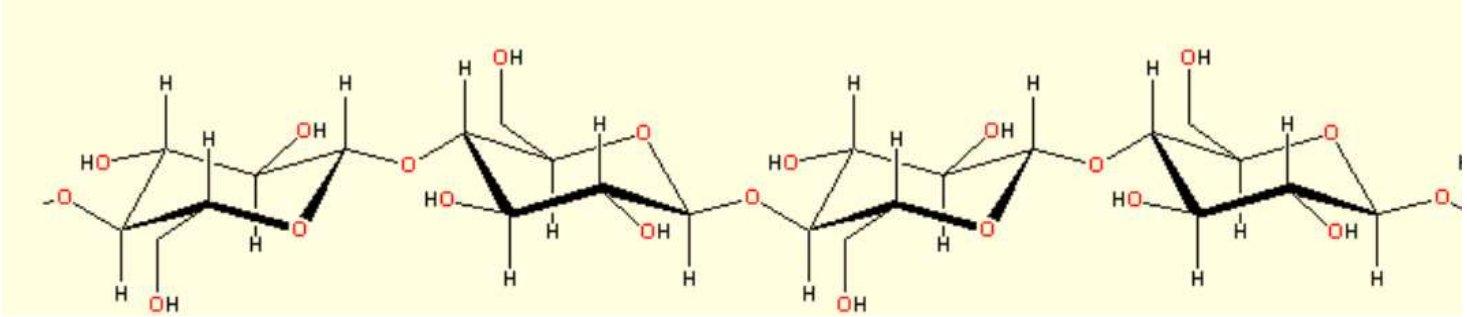
Everyone understands photosynthesis, carbon sequestration and benefits of using wood?

$$6CO_2 + 6H_2O + \text{light energy} \Rightarrow C_6H_{12}O_6 + 6O_2$$



Wood products are the most “environmental” building products you can get??

Right? / Wrong? / Prove it!!

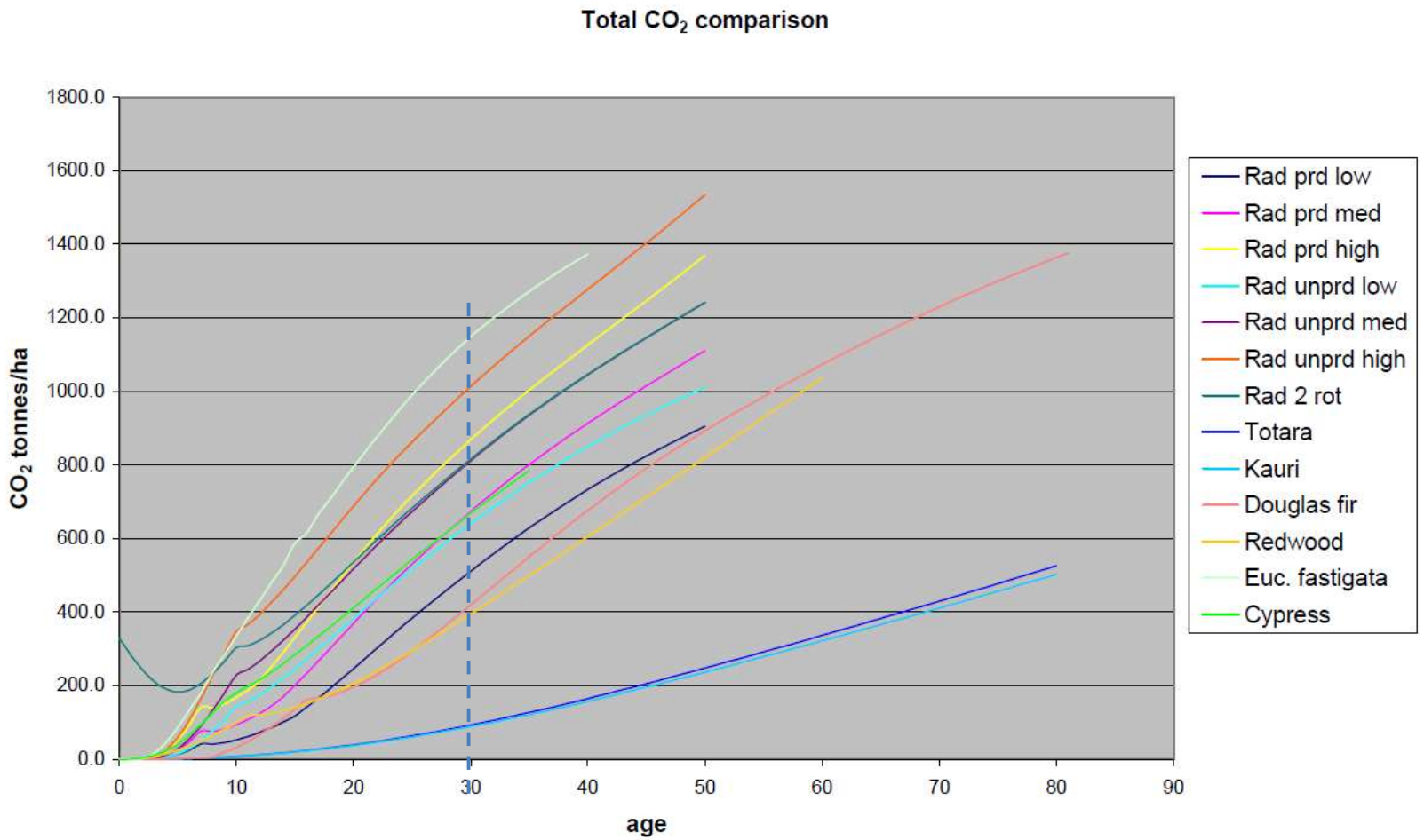


Figure 1: Total CO_2 for the radiata regimes and other tree species.

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WPMA decided to float a project to develop an EPD for and with its members.

The process started in 2015

Assistance was received from Scion and thinkstep

Arms were twisted…

A meeting was held at SCION.

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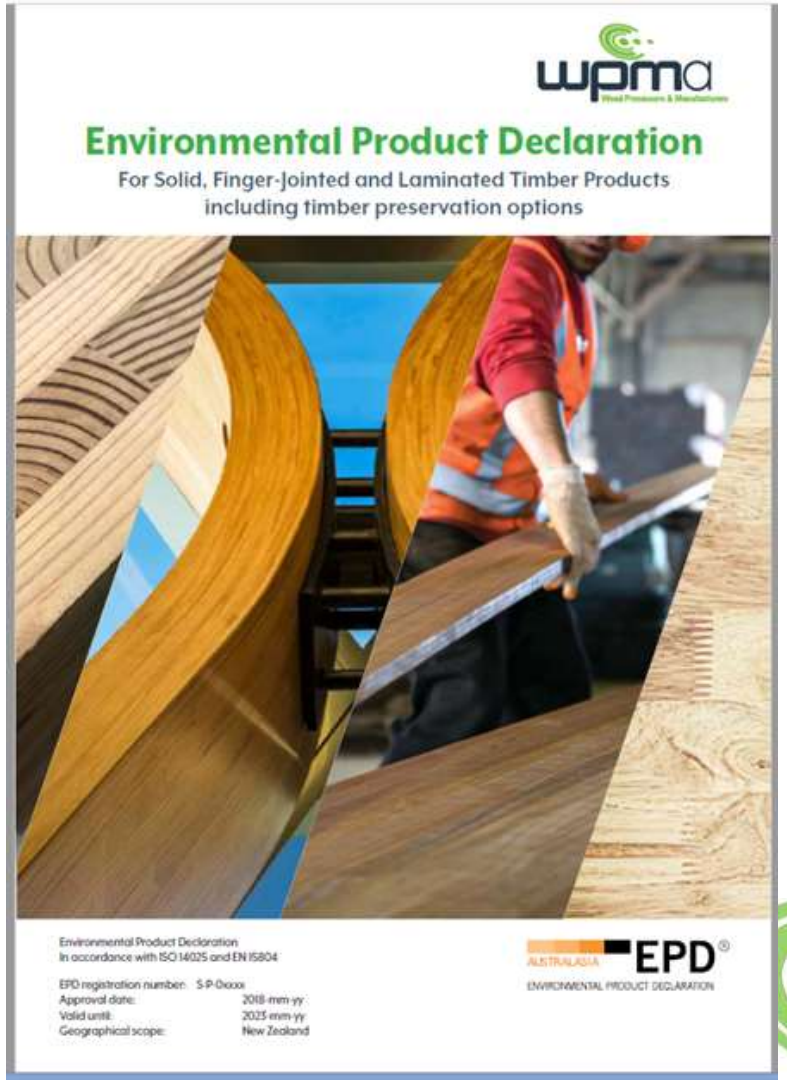

About 1/3 of WPMA member companies took part.

A wide range of timber products were analysed.

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- Abodo Wood Ltd. (www.abodo.co.nz)
- NorthPine Ltd. (www.northpine.co.nz)
- OTC Timber Co Ltd.(www.otctimber.co.nz)
- Red Stag Timber (www.redstagtimber.co.nz)
- Rosvall Sawmill Ltd (www.rosvall.co.nz)
- Taranakipine (www.taranakipine.co.nz)
- Techlam (www.techlam.nz)
- Tenon Clearwood LP (www.tenonmanufacturing.co.nz)
- Timberlab Solutions Ltd (www.timberlab.co.nz)
- Xlam NZ Ltd (www.xlam.co.nz)

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We produced an industry average EPD.

In this way the cost of developing the necessary data through the forestry, harvesting, sawing and drying phases could be shared among participating companies.

The consultancy used for data crunching was thinkstep, who also did the EPDs for

Forest and Wood Products Australia Ltd.

Products included in the EPD are

1. Sawn, kiln dried timber.

Used for pallets,

packaging,

temporary construction

2. Surfaced, kiln dried timber

Used for framing,

indoor panelling, mouldings

3. Finger-jointed timber

Used for mouldings, window reveals, weatherboards … and for further processing

4. Glue laminated timber

Used to create structures of great strength, durability and beauty

5. Cross laminated timber

The new kid on the block

CLT is taking the global construction industry by storm

The environmental impacts of various preservative treatment systems can be added to the various timber products.

H1.2	Boron	House framing
H3.1	LOSP	Outdoor products (paint coating required), not in ground contact, non-structural
H3.1	Copper Azole	Outdoor products (paint coating required), not in ground contact, non-structural
H3.2	CCA	Outdoor products not in ground contact, structural
H4	CCA	Outdoor products in ground contact, non-structural

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The EPD has lots of data!!!!

Table 6: Environmental impacts, 1 m³ of sawn softwood.

	Production	Landfill	Energy recovery	Recycling	Reuse
Parameter [Unit]	A1-A3	C4	C3	C3	C3
GWP [kg CO_2-eq.]	-747	57.3	805	805	805
GWPF [kg CO_2-eq.]	51.3	54.3	4.90	4.90	0
GWPB [kg CO_2-eq.]	-796	2.96	801	801	801
ODP [kg CFC11-eq.]	1.22E-10	7.25E-12	5.44E-15	5.44E-15	0
AP [kg SO_2-eq.]	0.387	0.160	0.0308	0.0308	0
EP [kg PO_4^{3-}-eq.]	0.0922	0.0213	0.00715	0.00715	0
POCP [kg C_2H_4-eq.]	0.187	0.0101	0.00268	0.00268	0
ADPE [kg Sb-eq.]	8.44E-06	6.15E-06	6.70E-08	6.70E-08	0
ADPF [MJ]	548	796	61.6	61.6	0

Table 7: Environmental impacts, 1 m³ of surfaced softwood.

	Production	Landfill	Energy recovery	Recycling	Reuse
Parameter [Unit]	A1-A3	C4	C3	C3	C3
GWP [kg CO_2-eq.]	-728	57.2	803	803	798
GWPF [kg CO_2-eq.]	66.9	54.3	4.89	4.89	0
GWPB [kg CO_2-eq.]	-795	2.96	798	798	798
ODP [kg CFC11-eq.]	1.49E-10	7.25E-12	5.42E-15	5.42E-15	0
AP [kg SO_2-eq.]	0.500	0.159	0.0307	0.0307	0
EP [kg PO_4^{3-}-eq.]	0.118	0.0213	0.00713	0.00713	0
POCP [kg C_2H_4-eq.]	0.254	0.0101	0.00267	0.00267	0
ADPE [kg Sb-eq.]	1.16E-05	6.15E-06	6.68E-08	6.68E-08	0
ADPF [MJ]	716	796	61.4	61.4	0

Table 8: Environmental impacts, 1 m³ of finger-jointed softwood.

	Production	Landfill	Energy recovery	Recycling	Reuse
Parameter [Unit]	A1-A3	C4	C3	C3	C3

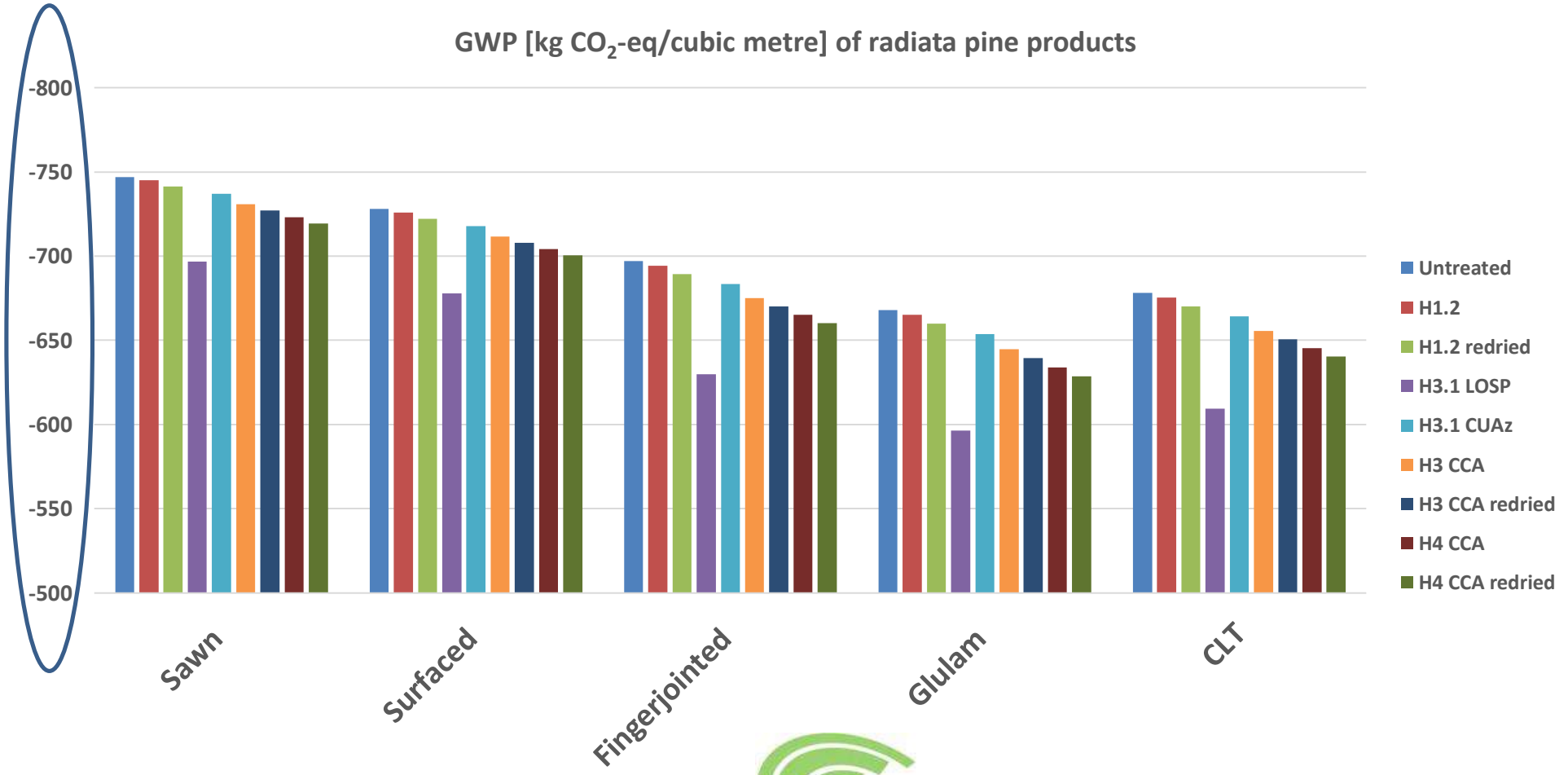
Table 12: Resource use, 1 m³ of surfaced softwood.

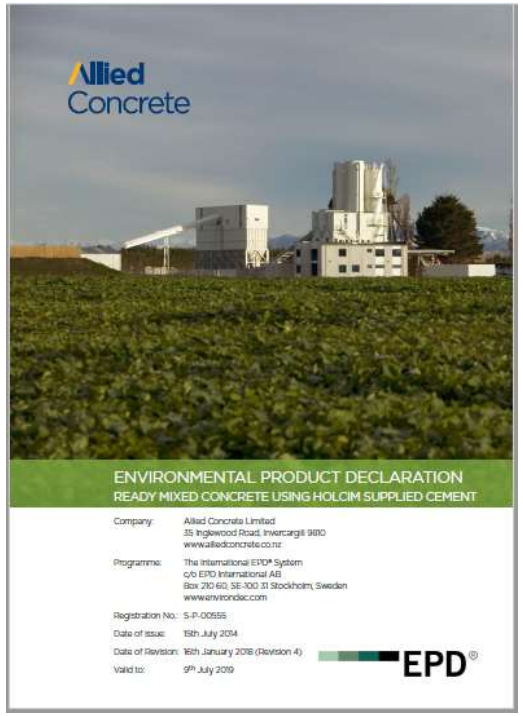
	Production	Landfill	Energy recovery	Recycling	Reuse
Parameter [Unit]	A1-A3	C4	C3	C3	C3
PERE [MJ]	5,330	76.5	3.12	3.12	0
PERM [MJ]	8,240	0	-8,240	-8,240	-8,240
PERT [MJ]	13,600	76.5	-8,230	-8,230	-8,240
PENRE [MJ]	720	814	61.4	61.4	0
PENRM [MJ]	0	0	0	0	0
PENRT [MJ]	720	814	61.4	61.4	0
SM [kg]	0	0	0	0	0
RSF [MJ]	3.60E-07	4.88E-21	7.57E-21	7.57E-21	0
NRSF [MJ]	4.56E-06	5.73E-20	8.89E-20	8.89E-20	0
FW [m³]	1.46	0.0506	6.62E-04	6.62E-04	0

Table 13: Resource use, 1 m³ of finger-jointed softwood.

	Production	Landfill	Energy recovery	Recycling	Reuse
Parameter [Unit]	A1-A3	C4	C3	C3	C3
PERE [MJ]	6,590	76.5	3.05	3.05	0
PERM [MJ]	8,140	0	-8,140	-8,140	-8,140
PERT [MJ]	14,700	76.5	-8,140	-8,140	-8,140
PENRE [MJ]	991	814	60.1	60.1	0
PENRM [MJ]	0	0	0	0	0
PENRT [MJ]	991	814	60.1	60.1	0
SM [kg]	0	0	0	0	0
RSF [MJ]	4.19E-07	4.88E-21	7.40E-21	7.40E-21	0
NRSF [MJ]	5.31E-06	5.73E-20	8.69E-20	8.69E-20	0
FW [m³]	2.02	0.0505	6.47E-04	6.47E-04	0

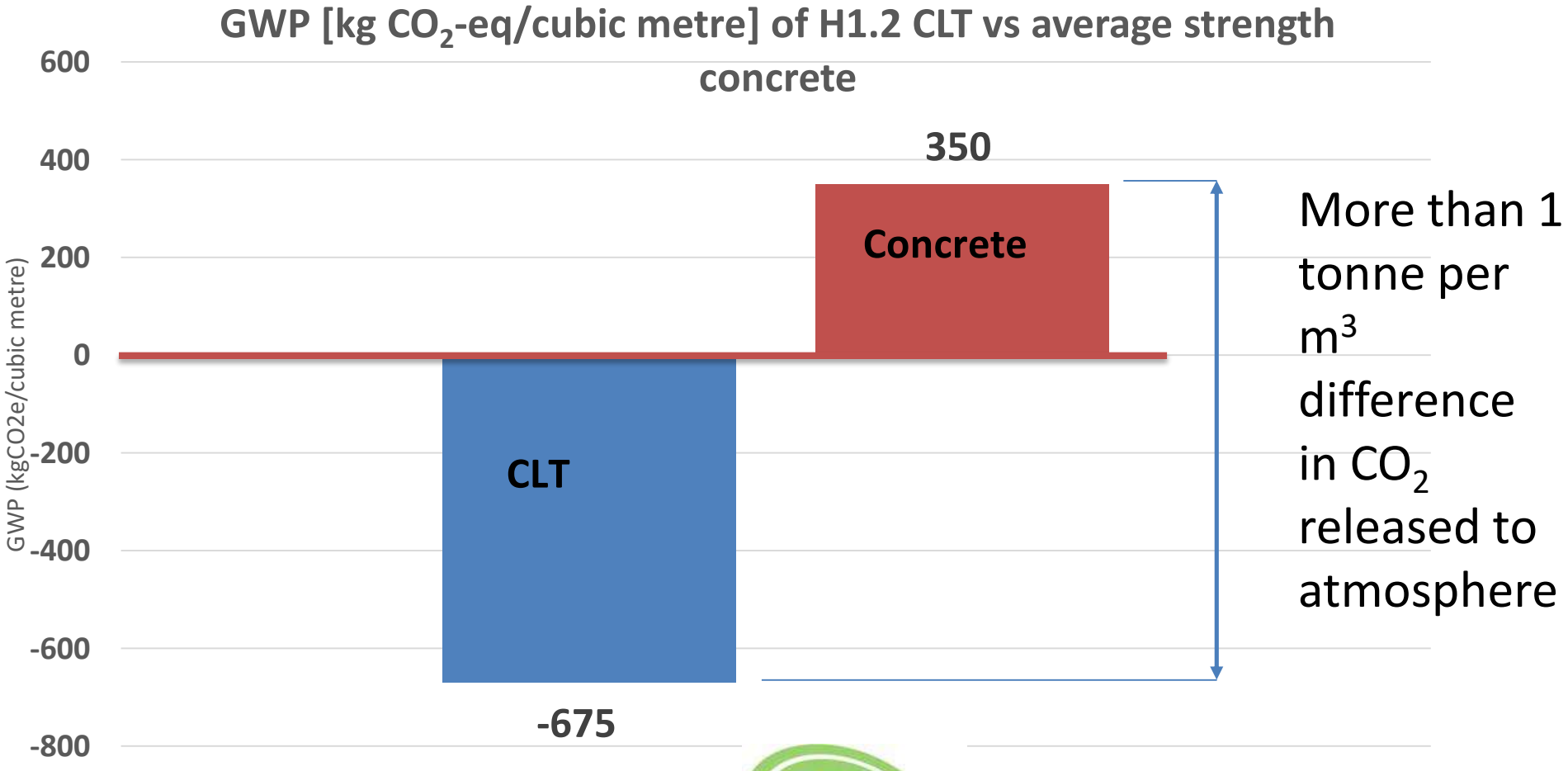
Treatment type:	H1.2 Boron	H1.2 Boron re-dried	H3.1 LOSP	H3.1 Copper Azole	H3 CCA	H3 R
Environmental Impact						
GWP [kg CO2-eq.]	2.00	5.72	50.2	10.1	16.3	20
GWPF [kg CO2-eq.]	1.99	5.61	50.1	10.0	15.9	19
GWPB [kg CO2-eq.]	0.0111	0.104	0.0979	0.133	0.354	0.
ODP [kg CFC11-eq.]	6.81E-12	6.99E-12	1.51E-10	5.73E-11	5.53E-10	5.
AP [kg SO2-eq.]	0.0115	0.0502	0.118	0.229	0.226	0.
EP [kg PO43--eq.]	0.00187	0.0107	0.0117	0.0118	0.00605	0.
POCP [kg C2H4-eq.]	0.000973	0.159	6.74	0.167	0.0109	0.
ADPE [kg Sb-eq.]	5.03E-07	1.18E-06	1.75E-04	4.95E-04	2.36E-03	2.


GWP [kg CO_2-eq/cubic metre] of radiata pine products
-800
-750
-700
-650
-600
-550
-500
Sawn
Surfaced
Fingerjointed
Glulam
CLT
Untreated
H1.2
H1.2 redried
H3.1 LOSP
H3.1 CUAz
H3 CCA
H3 CCA redried
H4 CCA
H4 CCA redried



PARAMETERS DESCRIBING ENVIRONMENTAL IMPACTS (A1 - A3 INCLUSIVE)

Parameter and units	Impact / m³ Normal ready mixed concrete (from batching plants using Holcim supplied cement)							
Compressive Strength (MPa)	17.5	20	25	30	35	40	45	50
Global warming potential (kg CO_2 equ.)	250	258	281	303	338	387	403	458



More than 1 tonne per m^3 difference in CO_2 released to atmosphere

New Zealand Green Building Council states "An EPD does not imply environmental superiority; it is solely a transparent declaration of the life-cycle environmental impact. The detailed, transparent environmental data that EPDs provide is an important step towards enabling whole-of-building life cycle assessment"

NZGBC currently allows up to two points to be awarded for use of EPDs in Greenstar projects. To get up to date information on use of EPDs in Greenstar please go to

https://www.nzgbc.org.nz/Attachment?Action=Download&Attachment_id=351

So what's it all for??

That depends on you!!

If you take on board the data offered by this EPD, put it in your BIM, use it to win projects, support the companies who enabled it, then other companies will be encouraged to get their own products assessed …

and the world will be a better place!!

Questions??