Channel Cladding

This Environmental Product Declaration (EPD) discloses potential environmental outcomes compliant with ISO 14025 for business to business communication.

The declared product Channel Cladding Paneling was made by Modinex Group in Australia in 2016 for sale with a replacement warranty for interior applications in commercial residential and industrial sectors.

Modinex has over 30 years' experience supplying architectural timber in Australia.

The company provides stylish, practical and durable timber solutions for Australian homes and commercial buildings.

They offer an extensive range of Western Red Cedar for interior and exterior cladding, panelling, screening, architraves and trims.

Their unique architectural timber innovations deliver modern profile designs.

Insulating Cedar cladding keeps buildings cooler in summer and warmer in winter.

Modinex's reputation is for innovative product design, uncompromising quality control and commitment to sustainability.

A modern air extraction and filtration system ensures workplace health and collects all dust and shavings for sale as coproducts.

Only sustainably sourced timber is used.

Replenishment of forests coherent with demand ensures timber supply for the future.

All their timber is certified sustainably sourced to reduce greenhouse emissions.

Forests absorb carbon dioxide (CO_2) from the atmosphere and emit oxygen.

Long after its use in buildings harvested timber banks that CO_2 securely away.

Seedlings planted to replace harvested trees continue to drawdown carbon from air.

Reliance on renewable resources now is a vital and timely key to a sustainable future.

The https://www.modinex.com.au/ site offers more information.

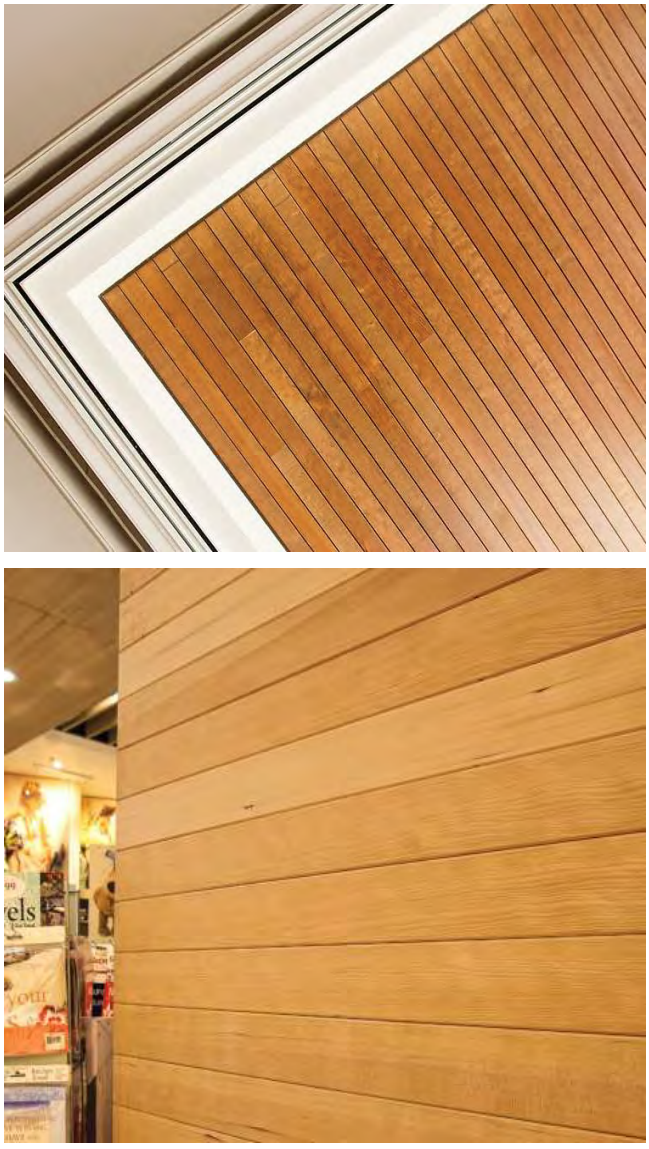

Figure 1 Modinex Channel Cladding Paneling

Channel Cladding

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Different program EPDs may not be comparable as e.g. Australian transport is more than elsewhere. **Further explanatory information is found at** http://www.globalgreentag.com/ or contact: certification1@globalgreentag.com

Channel Cladding

1. Details of This Declaration

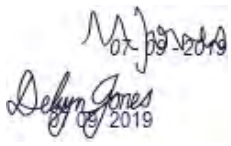
Program Operator	GreenTag Global Pty Ltd hereafter called Global GreenTag noted at www.globalgreentag.com
EPD Number	CED:CC05:2023:EP
Date issue	16th January 2023
Validity	16th January 2025
Reference PCR	Compliant with PCR WC: 2018
Time	Made in and sold from 2014 or 2015 for 60 years use
Geography	Made in Australia. Uses are assumed as for Australasia.
Application	Commercial, Residential and Industrial building exteriors
Declared Unit	Modinex Group Channel Cladding Paneling /kg cradle to gate
Functional unit	Modinex Group Channel Cladding Paneling 60-year interior use/kg cradle to fate

2. Product Characterisation

Definition	Channel Cladding Paneling by Modinex Group used for commercial, residential and industrial building applications
Standard	ISO 16598:2015 Timber structures -- Structural classification for sawn timber

3. Verification of this Declaration

This EPD was approved on 7th September 2019 according to requirements of ISO14025 8.1.3b.

Role	Name	Position	Signature
PCR Review Chair	Murray Jones	Ecquate Pty Ltd CEO	
LCA & EPD Developer	Delwyn Jones	The Evah Institute CEO	
3rd Party LCI Verifier	Shloka Ashar	Sustainability Studio Director	
Internal EPD Audit	David Baggs	Global GreenTag CEO & Program Director	

modinex GROUP
LEADING EDGE ARCHITECTURAL

Channel Cladding

4. Green Star® Certified Credits

Products are relevant to the Green Building Council of Australia's (GBCA) Green Star® scheme. If required this EPD is evidence the declared product meets the following Green Star® credits. It may be used as evidence in Green Star® submissions for those credits. The product is certified by GBCA recognised Global GreenTag GreenRate to meet the following credits of Green Star®:

- Interiors V1.2: Sustainable Products, Indoor Pollutants
- Design and As Built V1.2: Sustainable Product, Indoor Pollutants
- Performance V1.1: Refurbishment Materials

GBCA Disclaimer

Green Star® is a registered mark of the Green Building Council of Australia (GBCA). Assessments shall not be reproduced in part at any time. Rating Tools and Technical Manuals are subject to change by the GBCA. This EPD provides Technical Opinion and as such is not endorsed by the GBCA or its agents. Green Star® Technical Manuals give technical details of credit requirements.

5. Packaging, Installation, Use & Disposal

Packaging	Strapping on reused pallets.
Service life	Residential and commercial builds vary but 60-year life is assumed typical.
Health Safety & Environment	Apart from compliance to occupational and workplace health safety and environmental laws no additional personal protection is considered essential.
Residual Scrap	Mill off-cuts are sold as coproduct. At installation 5% scrap assumed to fuel use.
Cleaning & Maintenance Recycling	The recommended cleaning and maintenance raise no ecosystem or human health concerns. Care and maintenance guides are on company websites. Sawdust recyclate is used to fuel saw milling new product.
Re-use	This study assumes 60% product is serviceable for reuse over 40 more years.
Disposal	It assumes 30% is recycled. Incineration is rare in Australia so none is modelled.

6. Whole of life Performance

Health Protection	The product does not contain levels of carcinogenic, toxic or hazardous substances that warrant ecological or human health concern cradle to grave. It passed the Ecospecifier Cautionary Assessment Process (ESCAP) and no issues or red-light concerns existed for product human or ecological toxicity.
Effluent	The LCI results and ESCAP raised no re- light concerns in emissions to water[1].
Waste	Cradle to grave waste to landfill was <0.01% hazardous in fuel supply chains.
Environmental Protection	Continuous improvement under the maker's certified ISO14001 EMS aims to avoid toxics, waste and pollution plus reduce their material and energy use.
Environmental Health Effects	Installed products are certified as having VOC's compliant with Green Star® IEQ VOC credits for indoor environment[2] quality credits. No other potential in-use impacts on environment or health are known.

1 According with national standards in ANZECC Guideline For Fresh & Marine Water Quality (2000)
2 in accordance with national standards and practice

7. Life Cycle Scope and Boundary

In Figure 2 the letter x marks declared phases A_1 to A_3 cradle to gate where summary results are declared over the actual cradle to gate scope. Beyond that modules not declared are marked MND.

It also marks the phases A1 to D3 where summary results are declared considering modelling of actual supply and scenarios cradle to grave.

The cradle to grave scope includes all known operations in:

- Production including supply manufacture with transport cradle to gate then upstream;
- Construction with transport to site, installation and commissioning;
- Use and operation including maintenance, repair, replacement, refurbishment with transport, and
- End-of-life from deconstruction, demolition, reuse, recycling and disposal with transport.

Model Phase	Actual			Possible		Scenarios										Potential		
	Produce			Construct		Building Fabric					Operate Building		End of life				Beyond Boundary	
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D1, D2	D3
Unit Operation	Resources	Transport	Manufacture	Transport	Construction	Use	Maintain	Repair	Replace	Refurbish	Energy Use	Water Use	Demolish	Transport	Process Scrap	Disposal	Reuse	Recovery	Recycling
Cradle to Gate	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
Grave	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

8. Base Material Origin and Detail

Table 2 lists key components by function, type, key operation, source and % mass amount.

1. Table 2 Base Material

Function	Component	Production	Origin	% mass
Panelling	Hemlock	Forest, Fell, Float, Saw, Plane, Seal	Canada	>98 <99
Coating	Sealant	Forestry, Extract, Refine, Stain	Global	>1 < 2

9. Life Cycle Inventory Results

Table 3 lists material resource types and gross used per kg cradle to gate.

Table 3 Material Use /kg Declared Unit

Total Input of	Unit	A1 to A3
Finite Material	kg	1.03
Recycled Material	kg	0.01
Renewable Material	kg	4.25
Primary Water	litre	3.01
Recycled Water	litre	0.01

Table 4 lists the energy resource types and gross used per kg cradle to gate.

Table 4 Energy Use MJ/kg Declared Unit

Energy Source	Unit	A1 to A3
Fossil Fuel[3]	MJ	8.4
Nuclear Energy	MJ	2.0E-03
Hydrogen Energy	MJ	2.7E-05
Recovered Energy	MJ	-6.8E-04
Biomass Fuel	MJ	15.8
Hydro Power	MJ	0.02
Geothermal Energy	MJ	1.9E-05
Solar Energy	MJ	0.05
Wave/Tidal Energy	MJ	1.0E-03
Biomass Feedstock	MJ	17.9
Recoverable Feedstock	MJ	19.4
Gross Fuel + Feedstock	MJ	43.7

[3] Peat, Lignite, Coal, Gas, Oil, Sulphur, Hydrogen and Unspecified sources

10. Life Cycle Impact Potential Results

Table 5 shows product Life Cycle Impact Assessment (LCIA) results cradle to gate.

Table 5 Potential Impact /kg Declared Unit

Impact Potential	Unit	A_1 to A_3
Global Warming	kg CO_{2e100}	-1.18
Photochemical Ozone Creation	kg C_2H_{4e}	1.8E-4
Depletion of Stratospheric Ozone	kg $R11_e$	8.4E-12
Acidification of Land and Water	kg SO_{2e}	0.004
Eutrophication	kg $PO_4^{3-}{}_e$	0.001
Abiotic Depletion of Elements	kg Sb_e	2.6E-08

Table 6 shows product LCIA results over the full life cycle cradle to grave.

Table 6 Potential Impact/ kg Functional Unit

Evaluation Category	Unit	A1 to D3
Product mass	kg	1.00
Emission of Greenhouse Gas [4]	kg CO_{2e100}	-1.17
Depletion of Stratospheric Ozone	kg $R11_e$	5.2E-11
Acidification	kg SO_{2e}	0.005
Eutrophication	kg $PO_4^{3-}{}_e$	0.002
Damage to Ecosystem Quality	PDF*m^2*yr	1.1E-04
Damage to Human Health	DALY	9.5E-05
Abiotic Depletion of Fossil Fuels	$MJ_{surplus}$	0.83
Depletion of Mineral Resource	$MJ_{surplus}$	0.02

[4] Stocker et al (eds.) Climate Change 2013: The Physical Science Basis, CH8, IPCC AR5, Cambridge U Press, UK.

11. Life Cycle Benefit Potential

Manufacturer's qualitative details confirm the product offers positive outcomes cradle to grave. Human and ecosystem benefits arise from reliance on renewables and reclaimed scrap for sale and fuel use.

Climate, water and soil security benefits arise from reliance on renewable and reclaimed biomass.

Climate and Water Security Benefits of Renewable Content and Scrap Reuse

Climate Security	Carbon drawn down from air by flora sequestered in biomass in product
	Brakes climate change via carbon banked in standing forests and soils
Resource Security	Invests in resources for current use and growing stocks for future generations
	Produces recoverable feedstock for current and future generations
Water Security	Hectares intensive forest stabilising rain catchment and ground water table levels
	Forest leaf litter mulches retains soil hydration and reduces water stress
Soil Carbon Security	Carbon sequestered in unburnt tree roots in forest soil also brakes climate change
	Carbon banked in standing forest detritus, roots and soil brakes climate change

Biodiversity and habitat security benefits arise from reliance on renewable and reclaimed biomass.

Habitat and Biodiversity Security Benefits of Renewable Content and Scrap Reuse

Soil Health and Security	Extensive forest soil for microbe and worm biome nutrition and soil development
	Extensive forest leaf & litter mulching soil reducing temperature stress
Biodiversity Security	Extensive forest flora for biodiverse wildlife and pollinator forage and shelter
	Extensive forest flora for biodiverse bird, bee, pollinator and avian wildlife forage
Habitat Security	Extensive standing forest habitat for soil retention and soil biota refugia
	Extensive standing forest habitat for bird, bee, pollinator and avian wildlife refugia
Ecosystem Benefits	Extensive diverse forest range for flora and wild life foraging and grazing
	CO_{2e} sequestered in natural habitat, biomass & soil also braking climate change

Local and global benefits of forest log floated to sawmill reduced land freight and fossil fuel emissions.

Benefits of Avoided Transport

Ecological Health	Time free of smog, inhalable dust, volatile organics and carcinogens from vehicles
	Climate & Ozone layer reparation without land transport emissions
	Acid rain free safer air-sheds for natural terrestrial, aquatic and urban communities

Human and ecological health benefits flow from reliance on renewable and reclaimed biomass.

Health Benefits of Renewable Content and Scrap Reuse

Soil Habitat Health	Forest soil microbe and worm biome nutrition enhances soils and CO_{2e} drawdown
	Forest leaf & litter forage enhancing soil conditioning and mulching
Land Use & Space	Sawmills save natural land use by using scrap biomass instead of fossil fuel
	Saves natural land use in extensive mainland and island forest corridors
Ecological health	Health and safety benefits with climate security from braking global warming
	Environmental health benefits from avoiding fossil fuel generated dust and pollution

12. Life Cycle Benefit Results

This section shows quantitative Life Cycle Benefit Assessment (LCBA) for product use cradle to grave.

Table 7 lists benefits from Evah 2020 LCBA results /kg.

Table 7 Cradle to Grave Evah 2020 Gross Benefit Potential Results/kg

Benefit Layers	Units	Process Outcome	Result
Climate Security (CLIMES)			
Climate Brake CO_{2e}	kg CO_{2e20}	Carbon embodied in product biomass	0.96
Climate Security	kg CO_{2e20}	Carbon drawn down from air by biomass	2.10
Biomass Security	kgCO_{2e100}	Carbon sequestered in product biomass	1.19
Soil Carbon Security	kgCO_{2e100}	Carbon bank in tree roots in standing forest soil	2.19
Supply Energy & Resource Viability: Energy & Fuel (SERV)			
Energy Renewal	MJ $_{surplus}$	36.1% Reliance on renewable energy	18.12
Energy Recovery	MJ $_{surplus}$	0.001% Reliance on recovered energy	0.03
Water Recovery	l $_{Reuse}$	31.8% Reliance on recovered water	3.9
Fuel Recovery	MJ $_{surplus}$	62.8% Reliance on recovered fuel	18.3
Fuel Renewal	MJ $_{surplus}$	62.8% Reliance on biofuel	18.0
Feedstock Resource	MJ $_{surplus}$	42.9% Reliance on recoverable feedstock	21.6
Supply Energy & Resource Viability: Renewable & Biomass Matter(SERV)			
Material Biomass	MJ $_{surplus}$	88.5% Reliance on renewable feedstock	19.2
Resource Recovery	MJ $_{surplus}$	62.8% Reliance on recovered resources	18.3
Forestry Security	MJ	Biota, biome, litter, fibre & soil retained for seed	38.4
Community Security	MJ	Biomass plant forage for animals and recreation	57.5
Positive Ecosystem Replenishment Fraction (PERF)			
Habitat Recovery	PRF*m^2/yr	Forest landscape area for natural habitat	1.00
Ecosystem Recovery	PRF*m^2/yr	Sustainably managed plantation forest	0.99
Biodiversity Security	m^2/yr	Forest leaf & litter forage for biodiverse wildlife	255
Habitat Security	m^2/yr	Extensive forest flora for value added habitat	255
Climate Brake $_{100year}$	kg CO_{2e100}	Ecosystem retention & regeneration potential	2.19

13. Supply Chain Modelling

Processes to acquire, refine, transport, fabricate, coat, use, clean, repair, reuse and dispose of metal, masonry, ceramic, timber, glass, plastic and composites are modelled. These include those of:

- Mining, extracting and refining resources to make commodities and packaging;
- Acquiring, cultivating, harvesting, extracting, refining produce and biomass;
- Fuel production to supply power and process energy and freight;
- Chemicals use in processing resources, intermediates and ancillaries;
- Process energy, fuel and freight of resources, intermediates and ancillaries;
- Use, cleaning, recoating, repair, recycling, re-use and landfill, as well as
- Infrastructure process energy transformed and material wear loss e.g. tyres.

A flow chart in Figure 3 shows key product supply chain operations from cradle to fate. While all known operations are included not all are shown.

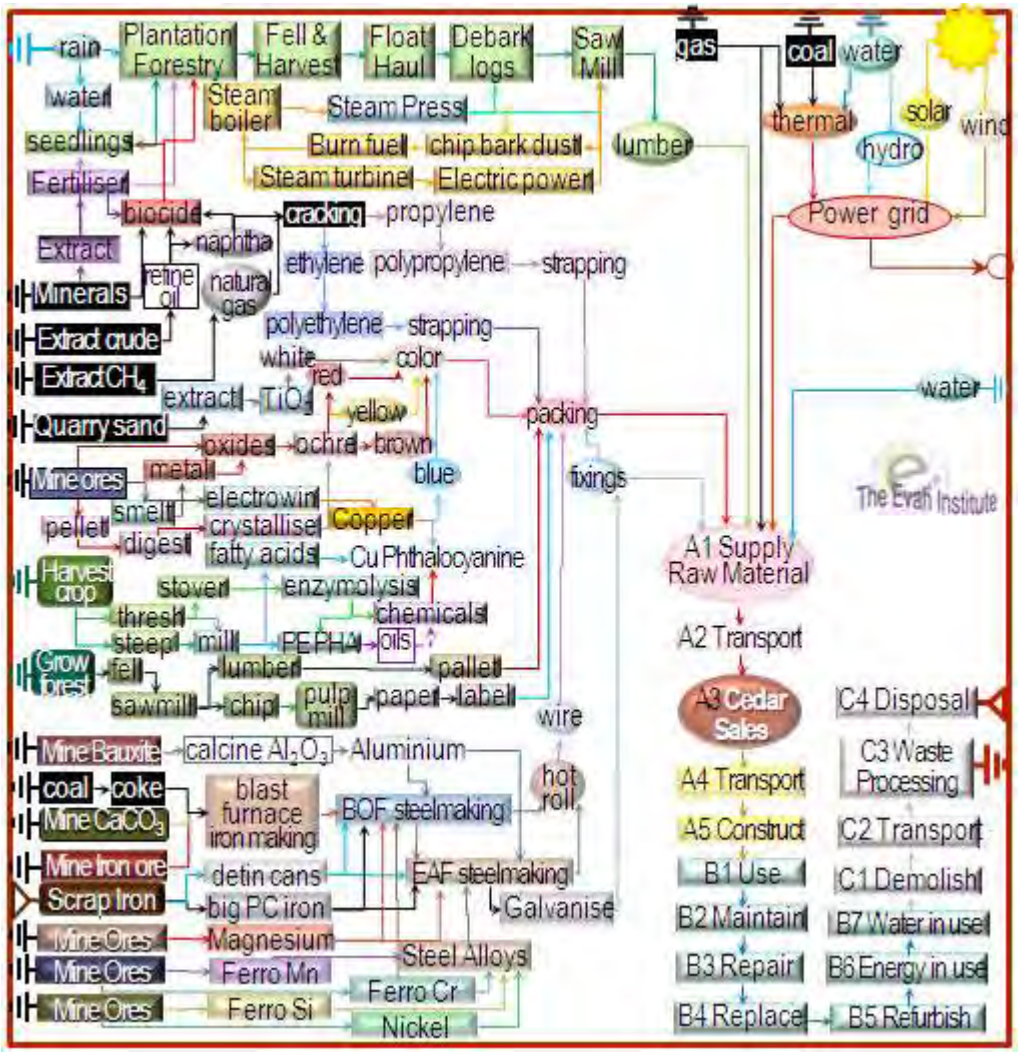


Figure 3 Major Product Operations

14. Life Cycle Assessment Method

LCA Author	The Evah Institute as described at www.evah.com.au
Study Period	Factory data was collected from 2015 to 2018
LCA Method	Compliant with ISO 14040 and ISO 14044 Standards
LCIA method	EcoIndicator 99 Life Cycle Impact (LCIA) Assessment
Scope	Cradle to Fate including all supply chain phases and stages depicted in Figure 2.
Phases	The LCA covered all known flows in all known stages cradle to end of life fate.
Assumptions	Use is to typical Australian Facility Management professional practice.
Scenarios	Use, cleaning, maintenance plus disposal and re-use were scenario-based using Facility Management Association denoted and published typical operations.
System Boundaries	The LCA system boundary depicted in Figure 2 includes all operations • A1-A3 production with upstream supply & transport; • A4 package & deliver & A5 construct; • B1 use with cleaning, B2 maintain, B3 repair, B5 refurbish, • C1 demolish, C2 transport and C4 disposal
Processes	All significant resource acquisition, water, fuel & energy use, power generation & distribution, freight, refining, intermediates, manufacture, scrap re-use and goods inwards packaging are included cradle to gate. Cradle to Grave scope includes packing and dispatch as well as installation, use, maintenance, landfill waste and emission flows from all supply chain operations involved to make, pack and install repair and demolish product.

Evah industry databases cover all known domestic and global scope 1 and 2 operations.

They exclude scope 3 burdens from capital facilities, equipment churn, noise and dehydration as well as incidental activities and employee commuting.

The databases exist in top zones of commercial global modelling and calculating engines.

Electricity supply models in active databases are updated annually.

As each project is modelled and new data is available the databases are updated and audited by external Type 1 ecolabel certifiers.

Quality control methods are applied to ensure:

- Coverage of place in time with all information for each dataset noted, checked and updated;
- Consistency to Evah guidelines for all process technology, transport and energy demand;
- Completeness of modeling based on in-house reports, literature and industry reviews;
- Plausibility in 2-way checks of LCI input and output flows of data checked for validity, plus
- Mathematical correctness of all calculations in mass and energy balance cross checks

15. Data Sources Representativeness and Quality

Primary data used for modelling the state of art of each operation includes all known process for:

- Technology sequences;
- Energy and water use;
- Landfill and effluent plus
- Reliance on raw and recycled material;
- High and reduced process emissions;
- Freight and distribution systems.

Primary data is sourced from clients, Annual Reports and their publications on corporate locations, logistics, technology use, market share, management systems, standards and commitment to improved environmental performance. Information on operations is also sourced from client:

- Supply chain mills, their technical manuals, corporate annual reports and sector experts, and
- Manufacturing specifications websites and factory site development license applications.

Background data is sourced from the International Energy Agency, IBISWorld, USGS Minerals, Franklin Associates, Boustead 6, Plastics Europe, CML2, Simapro 8, EcoInvent 3 and NREL USLCI model databases. Information on operations is also sourced from:

- Library, document, NPI and web searches, review papers, building manuals and
- Global Industry Association and Government reports on Best Available Technology (BAT).

For benchmarking, comparison and integrity checks inventory data is developed to represent BAT, business as usual and worst practice options with operations covering industry sector supply and infrastructure in Australia and overseas.

Such technology, performance and license conditions were modelled and evaluated across mining, farming, forestry, freight, infrastructure and manufacturing and building industry sectors since 1995.

As most sources do not provide estimates of accuracy, a pedigree matrix of uncertainty estimates to 95% confidence levels of Geometric Standard Deviation[2] (σ_g) is used to define quality as in Table 8[5].

Table 8 Data Quality Parameters and Uncertainty (U)

Correlation	Metric σ_g	U ±0.01	U ±0.05	U ±0.10	U ±0.20	U ±0.30
Reliability	Reporting	Site Audit	Expert verify	Region	Sector	Academic
	Sample	>66% trend	>25% trend	>10% batch	>5% batch	<1% batch
Completion	Including	>50%	>25%	>10%	>5%	<5%
	Cut-off	0.01%w/w	0.05%w/w	0.1%w/w	0.5%w/w	1%w/w
Temporal	Data Age	<3 years	≤5 years	<10 years	<15 years	>16 years
	Duration	>3 years	<3 years	<2 years	1 year	<1 year
Geography	Focus	Process	Line	Plant	Corporate	Sector
	Range	Continent	Nation	Plant	Line	Process
Technology	Typology	Actual	Comparable	In Class	Convention	In Sector

No data set with >±30% uncertainty is used without notation in the LCA as well as the EPD.

[5] Evah Institute data quality control system accords with UNEP SETAC Global LCI Database Quality 2010 Guidelines

16. Supply Chain Modelling Assumptions

Australian building sector rules and Evah assumptions applied are defined in Table 9.

Table 9 Scope Boundaries Assumptions and Metadata

Quality/Domain	National including Import and Export
Process Model	Typical industry practice with currently most common or best (BAT) technology
Resource flows	Regional data for resource mapping, fuels, energy, electricity and logistics
Temporal	Project & background data was collated 3 years to declaration approval date.
Geography	Designated client, site, regional, national, Pacific Rim then global jurisdiction
Representation	Designated client, their suppliers and energy supply chains back to the cradle
Consistency	Model all operations by known given operations with closest proximity
Technology	Typical of global or Pacific Rim supply chain 3 years to declaration approval date.
Functional Unit	Typical product with cleaning & disposal used for declared years' service life/m^2
System Control	
Primary Sources	Clients and supplier mills, publications, websites, specifications & manuals
Other Sources	IEA, USGS Minerals, IBISWorld, Boustead, Government & Industry reports
Data mix	Power grid & renewable shares updated to latest IEA & power generator reports
Operational	Company data for process performance, product share, waste and emissions
Logistics	Local data is used for power, fuel mix, water supply, logistics share & capacity
New Data Entry	VliegLCA, Evah Institute; Global Green Tag Researchers at declaration date.
Data Generator	Manufacturers, Evah Institute; GGT; Meta: IBIS, Other pre-publication date
Data Publisher	The Evah Institute Pty Ltd to Global GreenTag and designated client only
Persons input	All contributors cited in Evah & Global GreenTag records or websites
Data Flow & Mix	
System Boundary	Earth's cradle of all resource & emission flows to end of use, fitout or build life
System flows	All known from and to air, land, water and community sources & sinks
Capital inclusions	Natural stocksΔ, industry stockpilesΔ, capital wear Δ, system losses and use
Arid Practice	Dry technology adopted; Water use is factored by 0.1 as for e.g. Mining
Transportation	Distance >20% than EU; >20% fuel efficient larger vehicles, load & distance
Industrial	Company or industry sector data for manufacturing and minerals involved
Mining	All raw material extraction is based on Australian or Pacific Rim technology
Imported fuel	Mix is from nearest sources is e.g. UAE, SE Asia, Canada or New Zealand
Finishes	Processing inputs with finishing burdens are factored in. If not, that is denoted
Validation	
Accuracy	10^{th} generation study is ± 5 to 15% uncertain due to some background data
Completeness	All significant operations are tracked and documented from the cradle to grave
Precision	Tracking of >90% flows applies a 90:10 rule sequentially to 99.9% and beyond
Allocation	%100 to co products on reaction stoichiometry by energetic or mass fraction
Burdens	All resource use from & emissions to community, air, lands & waters are included
Plausibility	Results are checked and benchmarked against BAT, BAU & worst practice
Sensitivity	Calculated U is reported & compared to Bath U RICE & EcoInvent libraries
Validity Checks	Are made versus Plastics Europe, Ecobilan, GaBi & or Industry LCA Literature

17. References for this LCA & EPD

Australian & New Zealand (ANZECC) Guidelines For Fresh & Marine Water Quality (2000) http://www.environment.gov.au/water/quality/national-water-quality-management-strategy

Basel Convention (2011) Control of Transboundary Movement of Hazardous Waste & Disposal http://www.basel.int/portals/4/basel%20convention/docs/text/baselconventiontext-e.pdf

Boustead (2014) Model 6 LCI database http://www.boustead-consulting.co.uk/publicat.htm USA & UK

EcoInvent (2016) LCI Model 3 database http://www.ecoinvent.ch/ EcoInvent, Switzerland

Evah (2016) LCA Tools, Databases & Methodology at http://www.evah.com.au/tools.html

Franklin Associates (2016) US LCI Database http://www.fal.com/index.html Eastern Research Group US

GreenTag™ Certification (2016) http://www2.ecospecifier.org/services_offered/greentag_certification

GreenTag™ (2016) Product Category Rules http://www.globalgreentag.com/greentag-epd-program

Jones D., Mitchell. P. & Watson P. (2004) LCI Database for Australian Commercial Building Material: Report 2001-006-B-15, Sustainable Built Assets, CRC for Construction Innovation

Jones D.G et al. (2009) Chapter 3: Material Environmental LCA in Newton P et al., (eds) Technology, Design & Process Innovation in the Built Environment, Taylor & Francis, UK

IBISWorld (2014) Market Research, http://www.ibisworld.com.au/ IBISWorld Australia

International Energy Agency (2016) Energy Statistics http://www.iea.org/countries/membercountries/

ISO 9001:2008 Quality Management Systems Requirements

ISO 14001:2004 Environmental management systems: Requirements with guidance for use

ISO 14004:2004 EMS: General guidelines on principles, systems & support techniques

ISO 14015:2001 EMS: Environmental assessment of sites & organizations (EASO)

ISO 14020:2000 Environmental labels & declarations — General principles

ISO 14024:2009 Environmental labels & declarations -- Type I Principles & procedures

ISO 14025:2006 Environmental labelling & declarations Type III EPDs Principles & procedures

ISO 14031:1999 EM: Environmental performance evaluation: Guidelines

ISO 14040:2006 EM: Life cycle assessment (LCA): Principles & framework

ISO 14044:2006 EM: LCA: Requirement & guideline for data review: LCI; LCIA, Interpretation results

ISO 14064:2006 EM: Greenhouse Gases: Organisation & Project reporting, Validation & verification

ISO 15392:2008 Sustainability in building construction General principles

ISO 15686-1:2011 Buildings & constructed assets Service life planning Part 1: General principles

ISO 15686-2:2012 Buildings & constructed assets Service life (SL) planning Part 2: prediction

ISO 15686-8:2008 Buildings & constructed assets SL planning Part 8: Reference & estimation

ISO 21929-1:2011 Sustainability in building construction Sustainability indicators Part 1: Framework

ISO 21930:2007 Building construction: Sustainability, Environmental declaration of building products

ISO/TS 21931-1:2010 Sustainability in building construction: Framework for assessment, Part 1:

ISO 21932:2013 Sustainability in buildings and civil engineering works -- A review of terminology

Plastics Europe (2016) Portal http://www.plasticseurope.org/plastics-sustainability/eco-profiles.aspx

Pre (2016) SimaPro 8 Software, The Netherlands http://www.pre-sustainability.com/simapro-manuals

Myhre et al, 2013, Anthropogenic and Natural Radiative Forcing Chapter 8 in Stocker et al (eds.) Climate Change 2013, AR5 of the IPCC, Cambridge U Press UK. http://www.ipcc.ch/report/ar5/wg1/

Roache S. K. (2012) IMF Report WP/12/115 China's Impact on World Commodity Markets http://www.imf.org/external/pubs/ft/wp/2012/wp12115.pdf International Monetary Fund

UNEP (2016) Persistent Organic Pollutants http://www.chem.unep.ch/pops/ The UN

USLCI (2016) Life-Cycle Inventory Database https://www.lcacommons.gov/nrel/search, USA

U.S. Geological Survey National Minerals (2016) http://minerals.usgs.gov/minerals/pubs/country/ USA

US EPA (2016) Database of Sources of Environmental Releases of Dioxin like Compounds in U.S http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=20797 p 1-38, 6-9, USA

18. Reviewers Report Conclusions

The independent LCA reviewer's report confirmed that the LCA project report and addition information addressed the EPD. The verifier was not involved in developing the LCA or EPD and has no conflict of interests from their organisational position.

While the report is confidential its conclusions confirmed that documentation according to set ISO Standard requirements was provided including evidence from the:

The Evah Institute, the LCA developer:

a) Recipes of input and output data of unit processes used for LCA calculations √

b) Datasheets of measures, calculations, estimates and emails with sources as in Table 6 √

e) References to literature and databases from which data was extracted as noted in Table 6 √

g) Notes on supply chain processes and scenarios satisfying requirements of this Standard √

i) Embodied Energy shares as used for sensitivity analyses re ISO 14044:2006, 4.5.3.3 √

j) Proof percentages or figures in calculations in the end of life scenario √

k) Notes on proof of % and allocation calculations √

o) All operations covered Vs criteria and substantiation used to determine system boundaries √

Product Manufacturer in:

c) Specifications used to create the manufacturer's product √

d) Citations, references, specifications or regulations & data showing completeness √

f) Specification demonstrating that the building product can fulfil the intended use √

The Certifier Global GreenTag on:

l) Notes and calculation of averages of different locations yielding generic data √

m) Substantiating additional environmental information ISO 14025:2006, 7.2.4 √

n) Procedures for data collection, questionnaires, instructions, confidentiality deeds √

Requiring No Evidence:

As the EPD is cradle to grave as well as PCR compliant the independent reviewer did not need to:

h) Substantiate a few stages as all stages were substantiated √

p) Substantiate alternatives when no other choices and assumptions were applied √

q) Demonstrate consistency for few stages as the same rules in Tables 5 and 6 applied to all. √

Channel Cladding

This Environmental Product Declaration (EPD) discloses potential environmental outcomes compliant with ISO 14025 for business to business communication.

Further and explanatory information is found at

http://www.globalgreentag.com/

or contact:

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Global GreenTagCertTM EPD Program
Environmental Product Declaration
Compliant to ISO 14025