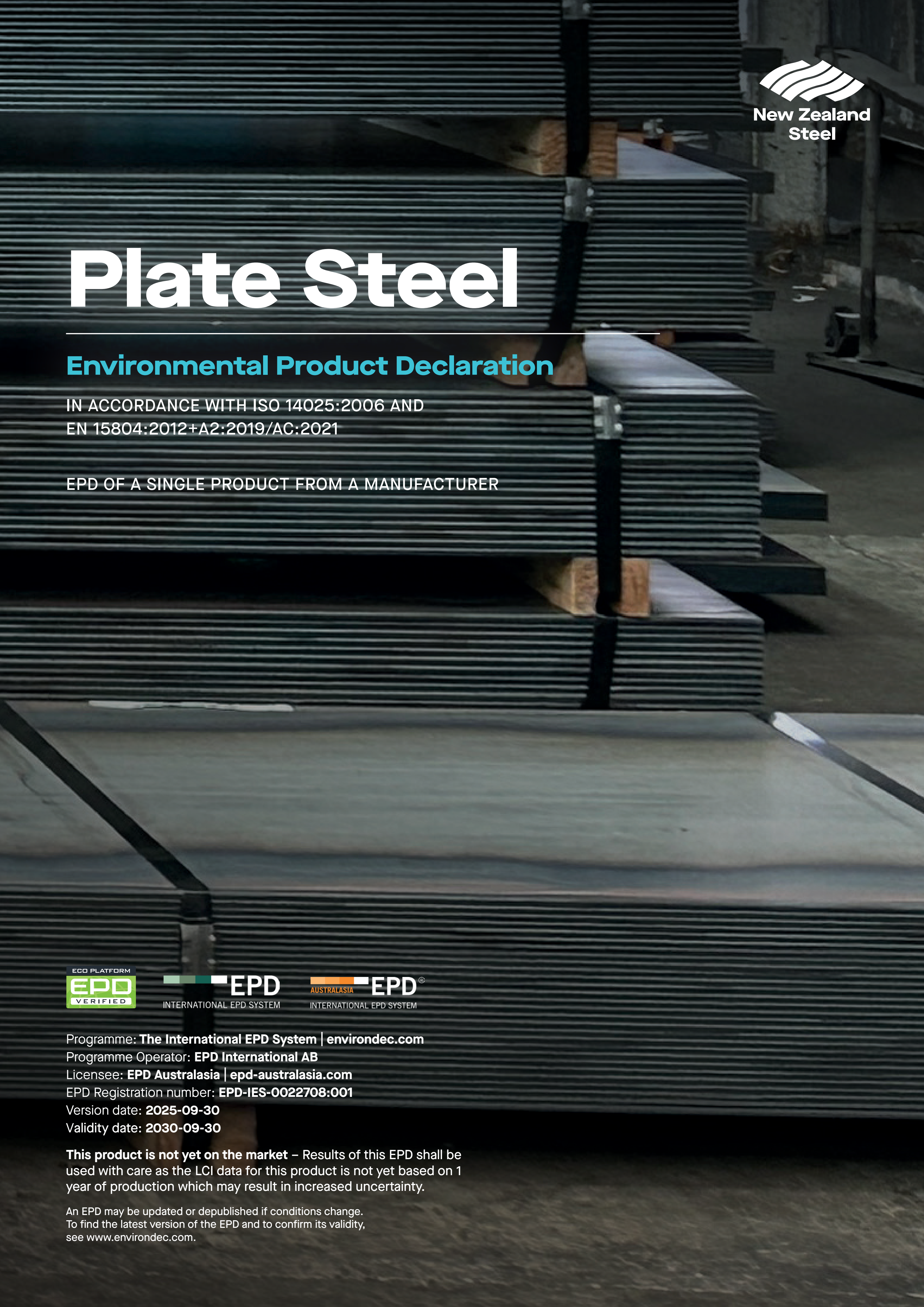


New Zealand Steel

Plate Steel

Environmental Product Declaration

IN ACCORDANCE WITH ISO 14025:2006 AND EN 15804:2012+A2:2019/AC:2021

EPD OF A SINGLE PRODUCT FROM A MANUFACTURER

ECO PLATFORM EPD VERIFIED

EPD INTERNATIONAL EPD SYSTEM

AUSTRALASIA EPD® INTERNATIONAL EPD SYSTEM

Programme: **The International EPD System | environdec.com**
Programme Operator: **EPD International AB**
Licensee: **EPD Australasia | epd-australasia.com**
EPD Registration number: **EPD-IES-0022708:001**
Version date: **2025-09-30**
Validity date: **2030-09-30**

This product is not yet on the market – Results of this EPD shall be used with care as the LCI data for this product is not yet based on 1 year of production which may result in increased uncertainty.

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com.

Information about EPD Owner

New Zealand Steel's (NZS) Glenbrook mill, located about 60 km south of Auckland, is a fully integrated steel plant that produces flat rolled steel products. It's unique in that it uses locally sourced ironsand as its ore and is the sole producer of such products in New Zealand. The mill produces around 670,000 tonnes of steel annually, which is used in various sectors like building, construction, manufacturing, and agriculture.

The NZS site holds AS/NZS ISO 9001 "Quality Management System" and AS/NZS ISO 14001 "Environmental Management System" certifications. Its various steel products also achieve Eco Choice certifications; Flat and Long Steel Products EC-41-15 and Pre-Painted Steel Products EC-57. NZS also holds ACRS certifications including; “Structural steel - Hot-rolled plates, floorplates, and slabs to AS/NZS 3678:2016” and “Hot-rolled steel flat products AS/NZS 1594:2002”.

Manufacturing & Processing in New Zealand

New Zealand Steel is in the process of installing an electric arc furnace (EAF) which will replace the current oxygen based steelmaking process via the Klockner Oxygen Blown Maxhutte (KOBM). This marks a significant decarbonisation step change in the steelmaking process by enabling large scale incorporation of external scrap, replacing a significant amount of primary iron requirements. This EPD reflects the significance of this upcoming change, and the need to produce this specific EPD for product not yet on the market.

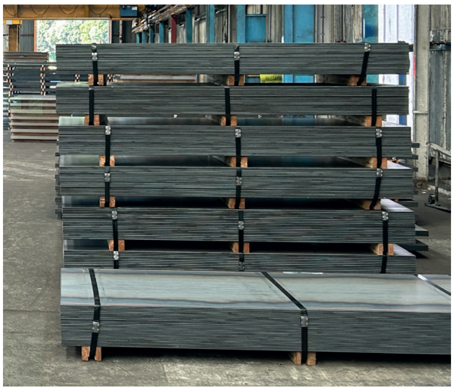
The EAF is planned to begin commissioning in late 2025, and be fully operational in early 2026. This change is expected to reduce site emissions by up to 1Mt of CO_2 annually (RNZ, 2024). All steel will be produced via the EAF, which can accept a combination of molten pig iron (produced from iron sand) or secondary steel scrap (post-industrial/post-consumer). This will also enable the production of very low emissions steel made with 100% scrap at the EAF.

New Zealand Steel manufactures steel from raw and recycled materials using an ‘integrated steelmaking’ method. This involves the use of ironsand, coal, steel scrap, fluxes (limestone) and alloying materials to produce steel slab via multi hearth, rotary kilns, melters, EAF steelmaking and continuous slab casting, prior to hot rolling into plate steel.

Information about EPD Owner	
Declaration Owner:	**New Zealand Steel** Web: www.nzsteel.co.nz Email: info@colorsteel.co.nz Phone: 0800 697 833 Post: Private Bag 92121, Auckland 1142, New Zealand New Zealand Steel
Life Cycle Assessment (LCA)	
LCA Accountability:	thinkstep Ltd Barbara Nebel Gaya Gamage Web: www.thinkstep-anz.com Email: info@thinkstep-anz.com Post: 11 Rawhiti Road, Pukerua Bay, Wellington 5026, New Zealand thinkstep anz
Geographical Scope:	New Zealand
Reference Year for Data:	2023-07-01 to 2024-06-30
Version History:	001 (2025-09-30) Original version of the EPD

Product Information

This EPD is valid for one kilogram (1kg) of Plate Steel manufactured by New Zealand Steel.



Product covered by EPD

Plate Steel are flat rolled plate products used in various industries like construction, infrastructure and manufacturing.

This EPD sets out information on the average Plate Steel product manufactured by New Zealand Steel. The EPD represents 'Alloyed steel' including the most common steel grades below. The list is not intended to be exhaustive. If clarification on a particular product is required, please contact New Zealand Steel at https://www.nzsteel.co.nz/contact-us/.

Table 1: Product Description

Product	Steel category	Steel grades
Plate Steel	Alloyed steel - Heavy structural steel plate, also manufactured into welded beams and columns, using in buildings and bridges and pressure vessels.	AS/NZS 3678 – 250, 300, 350, WR350, including variants with impact testing, through thickness testing, and customer specific variants and floorplate.

Table 2: Industry Classification

Product	Classification	Code	Category
Plate Steel	UN CPC Ver.2	41211	Flat-rolled products of non-alloy steel, not further worked than hot rolled, of a width of 600mm or more
	ANZSIC 2006	2711	Iron and Steel Manufacturing

This product is not yet on the market – Results of this EPD shall be used with care as the LCI data for this product is not yet based on 1 year of production which may result in increased uncertainty.

Electric Arc Furnace
The Future of Steelmaking

The Electric Arc Furnace (EAF) helps secure the future of steelmaking at the Glenbrook site in Auckland. It will enable New Zealand Steel to shrink its carbon footprint and will enable New Zealand, to be as close to self-sufficient as possible, utilising a largely renewable grid and recycling scrap steel.

In a landmark partnership between New Zealand Steel and the Government, the Electric Arc Furnace (EAF) project at the Glenbrook steel works, South of Auckland, replaces the current oxygen steelmaking furnace and decommissioning of two coal-fuelled kilns, achieving a substantial cut in coal use and carbon emissions.

Using an average of 30 megawatts on New Zealand's largely renewable grid, the EAF will melt down steel scrap, previously exported offshore, and process it into prime steel for new products. This initiative will provide our customers with lower carbon steel products, helping them build a stronger and more sustainable New Zealand.

Same steel, lower emissions

The EAF will begin commissioning by the end of 2025, with products available in market early 2026. To support this monumental change and give certainty, we are working with Thinkstep to develop a new range of environmental product declarations (EPDs), for both NZ Steel & Pacific Steel products. For updates visit www.nzsteel.co.nz/sustainability/ or reach out to sustainability@nz.bluescopesteel.com for more information.

The feed source of the EAF will be a standard blend of 50-60% scrap with a balance of liquid iron, significantly reducing the embodied carbon of all our steel products. We are also developing a new, much lower embodied carbon steel product, made from 100% scrap, (majority from post-consumer and post-industrial sources, with some home scrap).

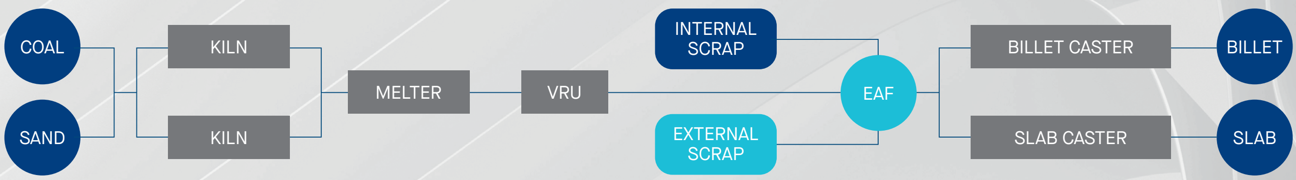
Pacific Steel, sister company to New Zealand Steel, has been proudly manufacturing steel reinforcing and wire products for over 60 years. Their PACIFIC DCRBtm reinforcing products, made with 100% scrap (internal & external), have a low embodied carbon (A1-A3 GWP) below 0.5 kg CO_2-eq/kg steel (see EPD-IES-0022722:002 & EPD-IES-0022724:002).

The future is circular

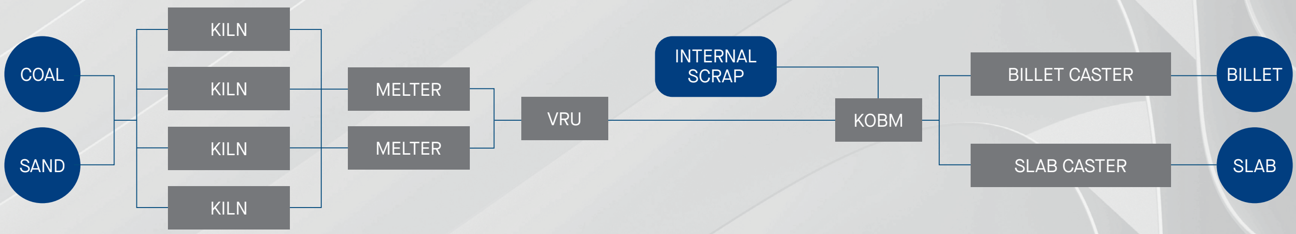
The EAF project exemplifies the benefits of a local circular economy model for both our industry and country. It enables us to solidify the circularity of steel, with the EAF allowing the recycling and manufacturing of steel within New Zealand in a continuous loop.

Our unique process, upgraded

The Electric Arc Furnace Process
Compared to the standard process, half the kilns and melter are required and external scrap can now be used.



The Original Process



Content Declaration

The typical steel composition, product content and packaging for 1kg of plate product (declared unit) is given below.

Table 3: Typical steel composition for 1 kg of product

Components	Mass (kg)
Iron	>97
Manganese	<0.8
Silicon	<0.05
Chromium	<0.1
Carbon	<0.1
Other	<0.1 each
TOTAL	**1**

Table 4: Content declaration for 1 kg of Plate Steel

Product Composition	Material	Mass (kg)	Post-consumer recycled material, mass-% of product*	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Steel Substrate	Carbon steel	1	44.3%	0	0
TOTAL		**1**	**44.3%**	**0**	**0**

*External scrap inputs include shred and heavy metal scrap (HMS), both of which are largely made up of post-consumer scrap. NZ Steel experts calculate post-consumer recycled material content based on estimates of available shred and HMS.

Table 5: Content declaration for average packaging for 1 kg of product

Packaging Materials	Mass (kg)	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Plastic film	1.93E-03	0.193%	0
Paper	7.48E-05	0.007%	3.37E-05
Steel	5.21E-04	0.052%	0
HDPE	5.75E-04	0.058%	0
Timber	1.59E-03	0.159%	6.67E-04
TOTAL	**0.0047**	**0.469%**	**0.0007**

Dangerous substances from the candidate list of SVHC for Authorisation

The product declared within this EPD:

- Does not release dangerous substances to soil and water
- Does not contain hazardous substances requiring labelling
- Does not contain materials identified in the European Chemicals Agency's Candidate List of Substances of Very High Concern in the products at a concentration greater than 0.1% (ECHA, 2025).

Life Cycle Assessment (LCA) Information

Declared Unit

The declared unit presented is one kilogram (1 kg) of plate steel.

System boundaries

As shown in the table below, this EPD is of the type Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D). Other life cycle stages (Modules A4-A5, B1-B7) are dependent on particular scenarios and best modelled at the building level.

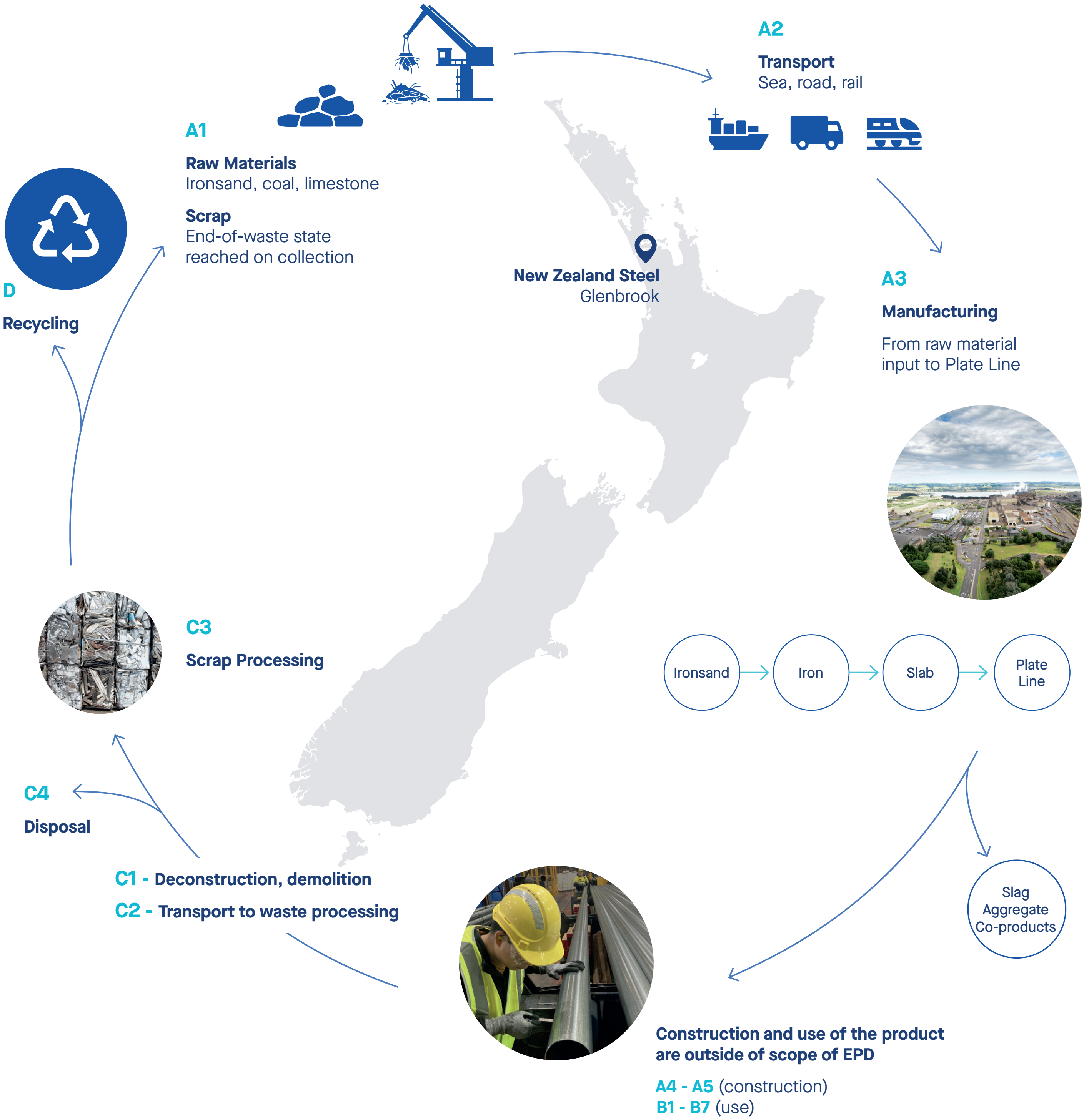
Table 6: Modules included in the scope of the EPD

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport of raw materials	Manufacturing	Transport to customer	Construction / installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction, demolition	Transport to waste processing	Waste processing	Disposal	Reuse / recovery / recycling potential
Modules	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	NZ										NZ	NZ	NZ	NZ	GLO

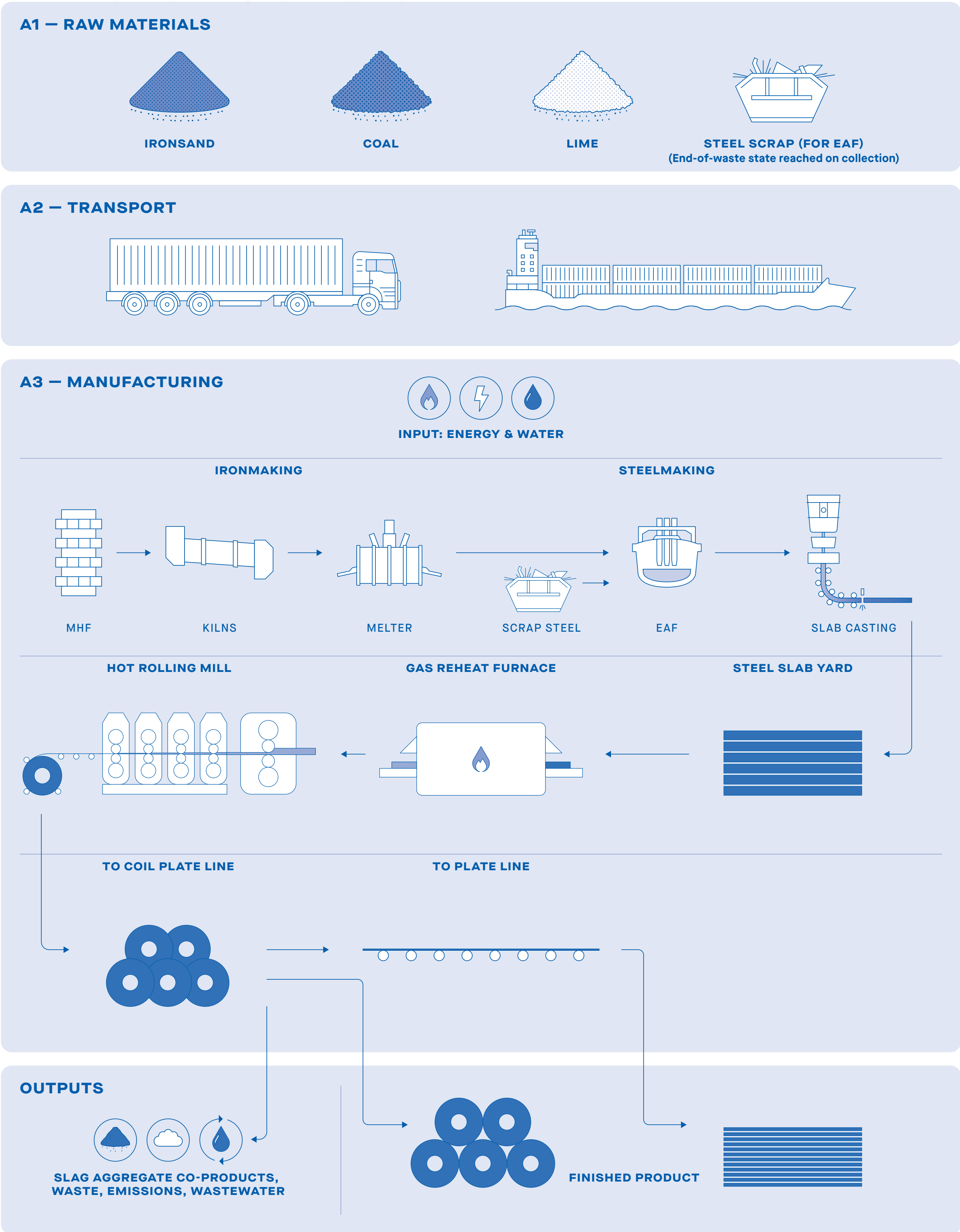
X = included in the EPD; ND = Module not declared (such a declaration shall not be regarded as an indicator result of zero)

*The percentage is based on the contribution from actual (measured) data associated with ironsand mining, iron production, EAF steel production (including the modelled electricity use), and product manufacture.

Product system process flow diagram



A1 - A3 Manufacturing Process



Life Cycle Assessment (LCA) Methodology

The underlying LCA model was developed using the Life Cycle for Experts (LCA FE) software (version 10.9.1.17) (formerly known as GaBi Software) for life cycle engineering, developed by Sphera Solutions, Inc.

Data for all energy inputs, transport processes and raw materials are from the Managed LCA Content (MLC) Database 2024.2 (Sphera, 2024). Most datasets have a reference year between 2020 and 2023, and therefore, all datasets are within the 10-year limit allowable for generic/secondary data under EN 15804 and the PCR.

Electricity

Electricity for primary iron making was based on New Zealand Steel's cogeneration plants. Steel making (EAF) and downstream processes use purchased electricity. New Zealand Steel does not purchase specific electricity mixes that provide Guarantee of Origin. Therefore, the residual electricity mix on the market is used for A1 and A3 processes that NZ Steel has control over.

The composition of the residual electricity grid mix of New Zealand is modelled in LCA FE 2024.2 based on published data for the year 2021-04-01 - 2022-03-31 (BraveTrace, 2023). The New Zealand residual electricity mix is made up of hydro (56.6%), geothermal (19.7%) natural gas (12.5%), wind (6.55%), coal (4.25%), biomass (0.266%) and biogas (0.160%). Onsite consumption (3.00%), and the medium voltage (1kV-60kV) grid's transmission and distribution losses (3.17%) are calculated based on data from the Ministry of Business, Innovation & Employment (MBIE, 2023). The emission factor for the New Zealand residual grid mix for the GWP-GHG indicator is 0.146 kgCO_2e/kWh (based on EF3.1).

Location-based grid mix is used for other electricity consumption including Modules C and D. The emission factor for the New Zealand location-based grid mix for the GWP-GHG indicator is 0.143 kg CO_2e/kWh (based on EF3.1).

Modelling of infrastructure/capital goods

Capital goods and infrastructure associated with electricity have been included in the background datasets as provided by the Managed LCA Content (MLC) database (Sphera, 2024). Infrastructure/capital goods associated with all other upstream, core and downstream processes have been excluded.

Allocation

Data for producing plate via hot strip milling were provided specifically and thus allocation was not required. Sub-metered electricity usage was available per process (e.g., for iron making, steel making, hot strip milling). Where submetering did not exist, electricity is allocated based on output mass. The packaging materials are allocated by mass across the total output of packaged products. For iron making, economic allocation is applied where slags produced are sold. Cut-off approach is applied for slag produced at the EAF. Steel scrap outputs during production are internally recycled at NZ Steel's EAF.

The model assumes that 44% of the steel slab used to make this product is produced from post-consumer scrap, 4% from post-industrial scrap, and 52% primary iron.

Internal steel scrap from production is treated as an internal flow that does not require allocation. Internally recycled scrap at NZ Steel's EAF is modelled burden-free. The internal scrap is made up of scrap containing iron, post-industrial and post-consumer scrap.

Post-industrial scrap has a burden based on assumed economic allocation between product and scrap. This was calculated using the price ratio between welded beams/columns produced from steel plate and the steel scrap generated from this process. GWP-GHG impact of post-industrial scrap is 0.302 kg CO_2 eq. per kg of steel scrap. This is likely a conservative value, as the relative value of welded beams/columns is not as high as for steel products that have undergone further processing. The impact of the allocation of post-industrial scrap on the LCA results depends on the percentage of post-industrial scrap input. For this EPD, impact from post-industrial scrap is immaterial.

The post-consumer scrap is burden-free, but includes impacts of shredding and transport to the EAF. GWP-GHG of post-consumer scrap is 0.0158 kg CO_2 eq. per kg of steel scrap.

Data Quality Assessment

A data quality assessment that complies with EN 15941 (CEN, 2024) was done as part of the LCA study.

Table 7: Data sources and share of primary data

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Iron making (including mining)	Collected data and database	EPD owner	2019-2023	Primary	72.7%
Steel making	Collected data and database	EPD owner	2024	Primary and secondary data	0.2%
Electricity	Collected data and database	MLC v2024.1	2024	Primary	2.2%
Natural Gas	Collected data and database	EPD owner	2024	Primary	12.5%
Fuels	Collected data and database	MLC v2024.1	2024	Primary	0.4%
Other Processes	Collected data and database	MLC v2024.1	2019-2023	Primary and secondary data	0.2%
TOTAL SHARE OF PRIMARY DATA, OF GWP-GHG RESULTS FOR A1-A3*					**88.2%**

* The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Time, geographical and technical representativeness

New Zealand Steel's Life Cycle Inventory (LCI) is based on a mix of data periods. All critical processes (i.e. processes with high contribution to environmental impact) are based on data from 2023-07-01 to 2024-06-30. Other processes (minimal contribution to environmental impact) reflect data for the period from 2018-07-01 to 2019-06-30. These processes have not seen process changes over the years and remain valid.

Data for the EAF is theoretical, based on engineering calculations. Data on scrap inputs (post-industrial and post-consumer) are theoretical, based on estimates made by experts. The quality of data used for modelling the EAF (both specific and generic data as per EN15941) is fair. Data used for other processes are either good or very good. No poor or very poor data is used. The use of fair data with more than 30% impact contribution to any core indicator is disclosed in Table 8.

All specific data (e.g., inbound transport, mining, ironmaking, and steelmaking) comes from New Zealand Steel, sourced from the Waikato North Head mine in Waikato and the Glenbrook Steelworks in Glenbrook, Auckland, New Zealand. Production and end-of-life stages are modelled for New Zealand. The default factors from the PCR are used to model module C. International datasets have been used for inputs purchased internationally or where location specific datasets were unavailable. Data taken from the MLC database reflects average or generic production and therefore does not correspond to actual New Zealand Steel suppliers.

Since this is an EPD for products not yet on the market, an updated EPD will be produced once specific data are available.

Table 8: Data quality information

Data set	Criteria and data quality level	Reason for level	Reason for using	Relevance
EAF	Geographical - Fair Technical - Fair	Calculated data	Best available data	Over 30% impact for ODP, GWP-biogenic, EP-freshwater and WDP
Electrodes at the EAF	Geographical - Fair Technical - Fair	Proxy or generic background data	Best available data	99% of ODP 0-8% of other core impact indicators

Modelling beyond A1-A3

End of Life (Modules C1-C4)

The recycling scenario in this EPD was based on a steel recycling report for New Zealand Heavy Engineering Research Association (HERA), where it was estimated that 85% of steel scrap from the building and infrastructure sector is recovered (thinkstep-anz, 2021). This rate (85%) is used for this EPD and is considered conservative. Results for 100% landfill and 100% recycling are provided as per PCR 2019:14.

End-of-life Modules (C1 – C4) were modelled based on default data from PCR 2019:14 (EPD International, 2025b). End-of-life allocation follows the requirements of EN15804:2012+A2:2019 (CEN, 2021) section 6.4.3.3.

The scenarios included are currently in use and are representative for one of the most probable alternatives.

Table 9: End-of-Life scenarios for products

Process	Unit (expressed per 1 kg of product)		
	EOL Main Scenario	100% Recycling Scenario	100% Landfilling Scenario
Collection process specified by type	1 kg of product collected with mixed construction waste		
Recovery system specified by type	0.85 kg for recycling (thinkstep-anz, 2021)	1 kg	0 kg
Disposal specified by type	0.15 kg modelled as ferrous metals in landfill	0 kg	1 kg
Assumptions for scenario development, e.g. transportation	C1 - Demolition/deconstruction of steel –diesel use of 1.1 kWh/tonne C2 - 80 km of transport by truck C3 - Loading and unloading at sorting facility (diesel use of 1.8 kWh/tonne); Fragging of steel (diesel use of 7.4 kWh/tonne); Mechanical sorting (electricity use of 2.2 kWh/tonne). C4 - Compacting of inert construction waste for landfills (including backfilling) (diesel use of 1.6 kWh/tonne)		

Recovery and Recycling potential (Module D)

Module D accounts for the net environmental benefits or burdens - beyond the system boundary - resulting from the recycling of scrap. It only applies to the net flow of recyclable materials, meaning that any potential benefits are calculated after deducting the post-consumer scrap used as input in the product's life cycle from the amount of scrap made available for recycling at the end-of-life.

Module D impacts are modelled using a combination of industry average inventories (45%) (worldsteel value of scrap dataset (Sphera, 2024)) and NZ Steel value of scrap (55%). The steel value of scrap datasets represents the difference between impact when manufacturing 100% primary and 100% secondary steel, and is used to represent the credit/burden at module D.

Module D for this EPD results in a credit as there is more net scrap available than post-consumer scrap input required (I.e., 0.85 kg scrap output - 0.56 kg scrap input = 0.29 kg net scrap per kg of plate).

Net scrap is calculated based on post-consumer scrap only. This does not take post-industrial scrap into account.

Cut off criteria

The cut-off criteria applied are: 1% of renewable and non-renewable primary energy usage, 1% of the total mass input of a process and 1% of environmental impacts.

Transport and packaging of minor raw materials that are insignificant to the overall impacts have been cut off.

Key assumptions

- Since the EAF is not yet operational, data for the EAF are based on modelled data provided by NZ Steel and the EAF designers. Similarly, the % scrap input is based on modelling and estimation of scrap forecasts.
- The split of scrap recycled domestically and internationally reflect NZ Steel's expected total demand of New Zealand's total scrap production. However, since steel scrap is a global commodity and now domestically sought for the EAF, the split and results may not be fully representative for NZ Steel.
- Any wastes from the production process (Module A3) are assumed to be transported over a 100 km distance to a treatment or disposal site.
- Where specific life cycle inventory data were unavailable, proxy data were used, giving preference to regional data.

Assessment Indicators

The results tables describe the different environmental indicators for each product per declared unit, for each declared module. The EN 15804 reference package based on EF 3.1 is used.

- Table 10 contains the core environmental impact indicators in accordance with EN 15804:2012+A2:2019 (CEN, 2021), describing the potential environmental impacts of the product.
- Table 11 provides additional environmental impact indicators in accordance with EN 15804:2012+A2:2019 (CEN, 2021).
- Table 12 shows the life cycle inventory indicators for resource use.
- Table 13 displays the life cycle inventory indicators for waste and other outputs.
- Table 14 displays biogenic carbon content indicators.
- Table 15 contains results for environmental impact indicators in accordance with EN 15804:2012+A1:2013 (CEN, 2013) to aid backward comparability.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The use of primary energy is separated into energy used as raw material and energy used as energy carrier as per option C in Annex 3 in the PCR (EPD International, 2025b).

Energy indicators (MJ) are always given as net calorific value.

Table 10: EN15804+A2 Core Environmental Impact Indicators

Impact category	Indicator	Unit
Climate change – total	GWP-total	kg CO_2-eq.
Climate change – fossil	GWP-fossil	kg CO_2-eq.
Climate change – biogenic	GWP-biogenic	kg CO_2-eq.
Climate change – land use and land use change	GWP-luluc	kg CO_2-eq.
Ozone depletion	ODP	kg CFC11-eq.
Acidification	AP	Mole of H+ eq.
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.
Eutrophication aquatic marine	EP-marine	kg N eq.
Eutrophication terrestrial	EP-terrestrial	Mole of N eq.
Photochemical ozone formation	POCP	kg NMVOC eq.
Depletion of abiotic resources – minerals and metals[1]	ADP-m&m	kg Sb-eq.
Depletion of abiotic resources – fossil fuels[1]	ADP-fossil	MJ
Water use[1]	WDP	m^3 world equiv.

Table 11: EN15804+A2 Additional Environmental Impact Indicators

Impact category	Indicator	Unit
Climate Change[2]	GWP-GHG	kg CO_2-eq.
Climate Change[3]	GWP-GHG (IPCC AR5)	kg CO_2-eq.
Particulate Matter emissions	PM	Disease incidences
Ionising Radiation – human health[4]	IRP	kBq U235 eq.
Eco-toxicity (freshwater)[1]	ETP-fw	CTUe
Human Toxicity, cancer[1]	HTP-c	CTUh
Human Toxicity, non-cancer[1]	HTP-nc	CTUh
Land use related impacts / soil quality[1]	SQP	Dimensionless (Pt)

Table 12: Life cycle inventory indicators on use of resources

Impact category	Indicator	Unit
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ
Use of renewable primary energy resources used as raw materials	PERM	MJ
Total use of renewable primary energy resources	PERT	MJ
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ
Total use of non-renewable primary energy resources	PENRT	MJ
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Net use of fresh water	FW	m^3

Table 13: Life cycle inventory indicators on waste categories and output flows

Impact category	Indicator	Unit
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Components for reuse	CRU	kg
Materials for energy recovery	MER	kg
Materials for recycling	MFR	kg
Exported electrical energy	EEE	MJ
Exported thermal energy	EET	MJ

Table 14: Biogenic carbon content indicators

Impact category	Indicator	Unit
Biogenic carbon content - product	BCC-prod	kg C
Biogenic carbon content - packaging	BCC-pack	kg C

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

Table 15: EN15804+A1 Environmental Impact Indicators

Impact category	Indicator	Unit
Global warming potential	GWP (EN15804+A1)	kg CO_2-eq.
Ozone depletion potential	ODP (EN15804+A1)	kg CFC11-eq.
Acidification potential	AP (EN15804+A1)	kg SO_2-eq.
Eutrophication potential	EP (EN15804+A1)	kg PO_4^{3-}-eq.
Photochemical ozone creation potential	POCP (EN15804+A1)	kg Ethene-eq.
Abiotic depletion potential for non-fossil resources	ADPE (EN15804+A1)	kg Sb-eq.
Abiotic depletion potential for fossil resources	ADPF (EN15804+A1)	MJ

Note: the indicators and characterisation methods are from EN 15804:2012+A1:2013, but other LCA rules (system boundaries, allocation, etc.) are according to EN 15804:2012+A2:2019; i.e., the results of the “A1 indicators” shall not be claimed to be compliant with EN 15804:2012+A1:2013.

Disclaimers

1 The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

2 This indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero. It has been included in the EPD following the PCR.

3 GWP-GHG (IPCC AR5) is an additional GWP100 indicator that is aligned with the Intergovernmental Panel on Climate Change (IPCC) 2013 Fifth Assessment Report (AR5) (IPCC 2013), national greenhouse gas reporting frameworks in Australia and New Zealand and previous versions of the Construction Products PCR (PCR2019:14v1.11). It excludes biogenic carbon and indirect radiative forcing.

4 This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and some construction materials, is also not measured by this indicator.

Environmental Performance

The following tables show the results for one declared unit of Plate.

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Biogenic carbon leaving the product system in module A5 has been balanced out already in modules A1-A3.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Energy indicators (MJ) are always given as net calorific value.

Results for primary scenario

Table 16: EN15804+A2 Core environmental impact indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO_2-eq.	2.06E+00	1.08E-03	1.14E-02	8.04E-03	2.36E-04	-8.50E-01
GWP-fossil	kg CO_2-eq.	2.06E+00	1.08E-03	1.14E-02	8.04E-03	2.36E-04	-8.51E-01
GWP-biogenic	kg CO_2-eq.	2.09E-04	1.60E-07	1.54E-06	2.90E-06	3.50E-08	1.99E-03
GWP-luluc	kg CO_2-eq.	2.28E-04	2.84E-08	3.01E-07	2.54E-07	6.20E-09	-8.92E-05
ODP	kg CFC11-eq.	2.85E-10	1.08E-16	1.15E-15	1.47E-15	2.37E-17	1.24E-11
AP	Mole of H+ eq.	2.29E-02	6.43E-06	8.44E-05	4.72E-05	1.40E-06	-7.45E-03
EP-freshwater	kg P eq.	2.58E-07	1.66E-10	1.77E-09	2.29E-09	3.63E-11	-7.81E-08
EP-marine	kg N eq.	3.08E-03	3.16E-06	4.26E-05	2.28E-05	6.90E-07	-7.98E-04
EP-terrestrial	Mole of N eq.	3.43E-02	3.46E-05	4.68E-04	2.52E-04	7.55E-06	-8.49E-03
POCP	kg NMVOC eq.	9.10E-03	8.53E-06	8.57E-05	6.15E-05	1.86E-06	-2.56E-03
ADP-m&m[1]	kg Sb-eq.	2.23E-07	1.43E-11	1.51E-10	1.39E-10	3.11E-12	-1.80E-06
ADP-fossil[1]	MJ	2.63E+01	1.43E-02	1.52E-01	1.05E-01	3.12E-03	-9.81E+00
WDP[1]	m^3 world equiv.	2.86E-01	4.07E-06	4.32E-05	4.55E-04	8.89E-07	2.63E-03

Table 17: EN15804+A2 Additional Environmental Impact Indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG[2]	kg CO_2-eq.	2.06E+00	1.08E-03	1.14E-02	8.04E-03	2.36E-04	-8.51E-01
GWP-GHG (IPCC AR5)[3]	kg CO_2-eq.	2.06E+00	1.08E-03	1.14E-02	8.04E-03	2.37E-04	-8.52E-01
PM	Disease incidences	1.43E-07	1.29E-10	4.35E-10	9.26E-10	2.81E-11	-3.29E-08
IRP[4]	kBq U235 eq.	3.16E-03	2.99E-07	3.18E-06	2.36E-06	6.53E-08	7.15E-03
ETP-fw[1]	CTUe	1.20E+01	6.38E-03	6.77E-02	7.13E-02	1.39E-03	-3.53E-01
HTP-c[1]	CTUh	2.94E-10	1.05E-13	1.12E-12	8.95E-13	2.29E-14	1.05E-10
HTP-nc[1]	CTUh	5.57E-09	2.30E-12	2.44E-11	1.65E-11	5.02E-13	-6.58E-10
SQP[1]	Pt	3.38E+00	2.91E-05	3.09E-04	2.27E-03	6.36E-06	-8.11E-01

Table 18: Use of resources

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	5.35E+00	6.19E-05	6.56E-04	1.56E-02	1.35E-05	1.26E-01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	5.35E+00	6.19E-05	6.56E-04	1.56E-02	1.35E-05	1.26E-01
PENRE	MJ	2.63E+01	1.43E-02	1.52E-01	1.05E-01	3.12E-03	-9.81E+00
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.63E+01	1.43E-02	1.52E-01	1.05E-01	3.12E-03	-9.81E+00
SM	kg	5.23E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.76E-02	8.28E-08	8.79E-07	3.16E-05	1.81E-08	-2.92E-02

Table 19: Waste production and output flows

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	1.48E-08	2.30E-13	2.44E-12	5.26E-12	5.02E-14	-2.60E-08
NHWD	kg	1.15E-01	3.51E-07	3.72E-06	4.94E-06	1.50E-01	9.88E-04
RWD	kg	3.22E-05	2.79E-09	2.96E-08	2.15E-08	6.09E-10	1.46E-06
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	8.50E-01	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 20: Biogenic Carbon Content

Indicator	Unit	A1-A3
Biogenic carbon content - product	kg	0.00E+00
Biogenic carbon content - packaging	kg	7.00E-04

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

Table 21: EN15804+A1 Environmental Impact Indicators

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP (EN15804+A1)	kg CO_2-eq.	2.05E+00	1.07E-03	1.13E-02	7.96E-03	2.34E-04	-8.42E-01
ODP (EN15804+A1)	kg CFC11-eq.	3.36E-10	1.28E-16	1.35E-15	1.73E-15	2.78E-17	1.46E-11
AP (EN15804+A1)	kg SO_2-eq.	1.95E-02	4.44E-06	5.74E-05	3.26E-05	9.70E-07	-6.47E-03
EP (EN15804+A1)	kg PO_4^{3-}-eq.	1.05E-03	1.06E-06	1.43E-05	7.71E-06	2.31E-07	-2.68E-04
POCP (EN15804+A1)	kg Ethene.	9.47E-04	4.83E-07	-2.01E-05	3.49E-06	1.05E-07	-4.14E-04
ADPE (EN15804+A1)	kg Sb-eq.	2.24E-07	1.43E-11	1.51E-10	1.39E-10	3.11E-12	-1.80E-06
ADPF (EN15804+A1)	MJ	2.62E+01	1.42E-02	1.51E-01	1.05E-01	3.10E-03	-9.96E+00

Results for additional scenarios

This section provides results for alternate end-of-life scenarios.

Table 22: EN15804+A2 Core environmental impact indicators

Indicator	Unit	100% Recycling			100% Landfilling		
		C3	C4	D	C3	C4	D
GWP-total	kg CO_2-eq.	9.46E-03	0.00E+00	-1.17E+00	0.00E+00	1.58E-03	9.48E-01
GWP-fossil	kg CO_2-eq.	9.46E-03	0.00E+00	-1.17E+00	0.00E+00	1.58E-03	9.50E-01
GWP-biogenic	kg CO_2-eq.	3.42E-06	0.00E+00	2.73E-03	0.00E+00	2.33E-07	-2.22E-03
GWP-luluc	kg CO_2-eq.	2.99E-07	0.00E+00	-1.23E-04	0.00E+00	4.13E-08	9.96E-05
ODP	kg CFC11-eq.	1.72E-15	0.00E+00	1.70E-11	0.00E+00	1.58E-16	-1.39E-11
AP	Mole of H+ eq.	5.55E-05	0.00E+00	-1.02E-02	0.00E+00	9.35E-06	8.31E-03
EP-freshwater	kg P eq.	2.70E-09	0.00E+00	-1.07E-07	0.00E+00	2.42E-10	8.71E-08
EP-marine	kg N eq.	2.69E-05	0.00E+00	-1.10E-03	0.00E+00	4.60E-06	8.90E-04
EP-terrestrial	Mole of N eq.	2.96E-04	0.00E+00	-1.17E-02	0.00E+00	5.04E-05	9.48E-03
POCP	kg NMVOC eq.	7.24E-05	0.00E+00	-3.52E-03	0.00E+00	1.24E-05	2.86E-03
ADP-m&m[1]	kg Sb-eq.	1.63E-10	0.00E+00	-2.47E-06	0.00E+00	2.07E-11	2.01E-06
ADP-fossil[1]	MJ	1.24E-01	0.00E+00	-1.35E+01	0.00E+00	2.08E-02	1.09E+01
WDP[1]	m^3 world equiv.	5.35E-04	0.00E+00	3.61E-03	0.00E+00	5.93E-06	-2.93E-03

Table 23: EN15804+A2 Additional Environmental Impact Indicators

Indicator	Unit	100% Recycling			100% Landfilling		
		C3	C4	D	C3	C4	D
GWP-GHG[2]	kg CO_2-eq.	9.46E-03	0.00E+00	-1.17E+00	0.00E+00	1.58E-03	9.50E-01
GWP-GHG (IPCC AR5)[3]	kg CO_2-eq.	9.46E-03	0.00E+00	-1.17E+00	0.00E+00	1.58E-03	9.51E-01
PM	Disease incidences	1.09E-09	0.00E+00	-4.51E-08	0.00E+00	1.87E-10	3.67E-08
IRP[4]	kBq U235 eq.	2.78E-06	0.00E+00	9.82E-03	0.00E+00	4.35E-07	-7.98E-03
ETP-fw[1]	CTUe	8.39E-02	0.00E+00	-4.85E-01	0.00E+00	9.28E-03	3.94E-01
HTP-c[1]	CTUh	1.05E-12	0.00E+00	1.44E-10	0.00E+00	1.53E-13	-1.17E-10
HTP-nc[1]	CTUh	1.94E-11	0.00E+00	-9.03E-10	0.00E+00	3.35E-12	7.34E-10
SQP	Pt	2.67E-03	0.00E+00	-1.11E+00	0.00E+00	4.24E-05	9.05E-01

Table 24: Use of resources

Indicator	Unit	100% Recycling			100% Landfilling		
		C3	C4	D	C3	C4	D
PERE	MJ	1.84E-02	0.00E+00	1.73E-01	0.00E+00	9.00E-05	-1.41E-01
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.84E-02	0.00E+00	1.73E-01	0.00E+00	9.00E-05	-1.41E-01
PENRE	MJ	1.24E-01	0.00E+00	-1.35E+01	0.00E+00	2.08E-02	1.09E+01
PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	1.24E-01	0.00E+00	-1.35E+01	0.00E+00	2.08E-02	1.09E+01
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	3.72E-05	0.00E+00	-4.01E-02	0.00E+00	1.20E-07	3.26E-02

Table 25: Waste production and output flows

Indicator	Unit	100% Recycling			100% Landfilling		
		C3	C4	D	C3	C4	D
HWD	kg	6.19E-12	0.00E+00	-3.57E-08	0.00E+00	3.35E-13	2.90E-08
NHWD	kg	5.81E-06	0.00E+00	1.36E-03	0.00E+00	1.00E+00	-1.10E-03
RWD	kg	2.53E-08	0.00E+00	2.00E-06	0.00E+00	4.06E-09	-1.63E-06
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	1.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 26: EN15804+A1 Environmental Impact Indicators

Indicator	Unit	100% Recycling			100% Landfilling		
		C3	C4	D	C3	C4	D
GWP (EN15804+A1)	kg CO_2-eq.	9.36E-03	0.00E+00	-1.16E+00	0.00E+00	1.56E-03	9.40E-01
ODP (EN15804+A1)	kg CFC11-eq.	2.03E-15	0.00E+00	2.01E-11	0.00E+00	1.86E-16	-1.63E-11
AP (EN15804+A1)	kg SO_2-eq.	3.84E-05	0.00E+00	-8.88E-03	0.00E+00	6.46E-06	7.22E-03
EP (EN15804+A1)	kg PO_4^{3-}-eq.	9.07E-06	0.00E+00	-3.67E-04	0.00E+00	1.54E-06	2.99E-04
POCP (EN15804+A1)	kg Ethene.	4.10E-06	0.00E+00	-5.69E-04	0.00E+00	7.02E-07	4.62E-04
ADPE (EN15804+A1)	kg Sb-eq.	1.63E-10	0.00E+00	-2.47E-06	0.00E+00	2.08E-11	2.01E-06
ADPF (EN15804+A1)	MJ	1.23E-01	0.00E+00	-1.37E+01	0.00E+00	2.07E-02	1.11E+01

Abbreviations

ACRS	Australasian Certification for Reinforcing Steel
AS/NZS	Australian/New Zealand Standard
ANZSIC	Australian and New Zealand Standard Industrial Classification
CEN	European Committee for Standardization
CPC	Central product classification
EAF	Electric Arc Furnace
EF	Environmental Footprint
EN	European Norm (Standard)
GPI	General Programme Instructions
HERA	Heavy Engineering Research Association
ISO	International Organization for Standardization
KOBM	Klockner Oxygen Blown Maxhutte.
LCA FE	Life Cycle for Experts
LCI	Life Cycle Inventory
MBIE	Ministry of Business, Innovation, and Employment
MHF	Multi Hearth Furnace
MLC	Managed LCA Content
ND	Not Declared
NZ	New Zealand
NZS	New Zealand Steel
SVHC	Substance of Very High Concern

References

AS/NZS. (2002). 1594:2002 Hot-rolled steel flat product. Standards Australia/Standards New Zealand.

AS/NZS. (2002). 1594:2025 Hot-rolled steel flat product. Standards Australia/Standards New Zealand.

AS/NZS. (2016). ISO 14001 Environmental Management System. Standards Australia/Standards New Zealand.

AS/NZS. (2016). 3678:2016 Structural steel - Hot-rolled plates, floorplates, and slabs. Standards Australia/Standards New Zealand.

BraveTrace. (2023). NZECS Residual Supply Mix for electricity certification. New Zealand.

CEN. (2013). EN 15804:2012+A1:2013, Sustainability of construciton works - Environmental product declarations - Core surels for the product category of construciton products. European Committee for Standardization.

CEN. (2021). EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products. Brussels: European Committee for Standardization.

CEN. (2024). EN 15941:2024, Sustainability of construction works – Data quality for environmental assessment of products and construction work – Selection and use of data. Brussels: European Committee for Standardization.

ECHA. (2025). Candidate List of substances of very high concern for Autherisation. Retrieved from European Chemical Agency: https://echa.europa.eu/candidate-list-table

ECO Platform. (2024). ECO Platform standards, versions published 2024-12-20. Retrieved from https://www.eco-platform.org/our-documents.html.

EPD International. (2025a). General Programme Instructions for the International EPD System. Version 5.0.1, dated 2025-02-27. Stockholm: EPD International AB.

EPD International. (2025b). PCR 2019:14 Construction Products version 2.0.1 of 2025-06-05 (valid until 2030-04-07). Stockholm: EPD International AB.

IPCC. (2013). Climate Change 2013: The Physical Science Basis. Geneva, Switzerland: IPCC.

ISO. (2006a). ISO 14040: Environmental management – Life cycle assessment – Principles and framework. Geneva: International Organization for Standardization.

ISO. (2006b). ISO 14044: Environmental management – Life cycle assessment – Requirements and guidelines. Geneva: International Organization for Standardization.

ISO. (2006c). ISO 14025: Environmental labels and declarations - Type III environmental declarations - Principles and procedures. Geneva: International Organization for Standardization.

MBIE. (2023). Annual Electricity Data Updates. New Zealand: Ministry of Business, Innovation, and Employment.

RNZ. (2024). Carbon saved by NZ Steel's new furnace upped to 1 million tonnes a year, brought forward to 2025. Retrieved from https://www.rnz.co.nz/news/business/526540/carbon-saved-by-nz-steel-s-new-furnace-upped-to-1-million-tonnes-a-year-brought-forward-to-2025

Sphera. (2024). Life Cycle Inventory Database 2024 Documentation. Retrieved from Sphera: https://lcadatabase.sphera.com/

thinkstep-anz. (2021). HERA Report R5-89: Steel recycling, v.2. New Zealand: HERA.

General Information

An Environmental Product Declaration, or EPD, is a standardised and verified way of quantifying the environmental impacts of a product based on a consistent set of rules known as a PCR (Product Category Rules). The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 (CEN, 2021) and ISO 14025 (ISO, 2006c).

The results for EN15804+A1 (CEN, 2013) compliant EPDs are not comparable with EN15804+A2 (CEN, 2021) compliant studies as the methodologies are different. To support backwards comparability and compatibility, environmental performance results have also been provided for the indicators required in EN15804+A1, although the study does not claim compliance with this standard.

Environmental Product Declaration

Plate Steel

Programme Information	
EPD Programme Operator:	**EPD International AB** Web: www.environdec.com Email: support@environdec.com Post: EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden
Licensee:	**EPD Australasia Limited** Web: www.epd-australasia.com Email: info@epd-australasia.com Post: EPD Australasia Limited, 6 Cube Court, Richmond 7020, New Zealand
Product Category Rules (PCR)	CEN standard EN 15804 serve as the core Product Category Rules (PCR)
PCR:	PCR 2019.14 Construction Products, version 2.0.1 (published on 2025-06-05, valid until 2030-04-07)
PCR review conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com for a list of members.
Review Chairs:	Rob Rouwette, start2see (chair), Noa Meron, thinkstep-anz (co-chair). The review panel may be contacted via the Secretariat: www.environdec.com/contact
Verification	
External and independent ('third-party') verification of the declaration and data, according to ISO 14025:2006, via EPD verification through:	☑ Individual EPD verification without a pre-verified LCA/EPD tool ☐ Individual EPD verification with a pre-verified LCA/EPD tool ☐ EPD Process Certification* without a pre-verified LCA/EPD tool ☐ EPD Process Certification* with a pre-verified LCA/EPD tool ☐ Fully pre-verified EPD tool
Third-party verifier:	[signature] **Rob Rouwette, start2see Pty Ltd** Web: www.start2see.com.au Email: Rob.Rouwette@start2see.com.au
Verifier approved by:	**EPD Australasia Ltd and The International EPD System**
Procedure for follow-up during EPD validity involves third party verifier:	☑ Yes ☐ No

For further information,
contact New Zealand Steel

0800 697 833
nzsteel.co.nz

New Zealand Steel Limited

131 Mission Bush Road, Glenbrook 2681, New Zealand