



thinkstep  
anz



# Steel Product Carbon Offset Programme

Programme Instructions - On behalf of HERA

**Client:** HERA  
**Title:** Steel Product Carbon Offset Programme – Programme Instructions  
**Report version:** v3.0  
**Report date:** 27/10/2020

© thinkstep Ltd

#### Document prepared by

Simon Love  
Sustainability Strategy  
simon.love@thinkstep-anz.com

#### Quality assurance by

Emily Townsend  
Sustainability Engineer  
emily.townsend@thinkstep-anz.com

#### Contact

thinkstep Ltd  
11 Rawhiti Road  
Pukerua Bay  
Wellington 5026  
New Zealand

Web [www.thinkstep-anz.com](http://www.thinkstep-anz.com)  
Email [anz@thinkstep-anz.com](mailto:anz@thinkstep-anz.com)  
Phone +64 4 889 2520



This report has been prepared by thinkstep-anz with all reasonable skill and diligence within the agreed scope, time and budget available for the work. Thinkstep-anz does not accept responsibility of any kind to any third parties who make use of its contents. Any such party relies on the report at its own risk. Interpretations, analyses, or statements of any kind made by a third party and based on this report are beyond thinkstep-anz's responsibility.

If you have any suggestions, complaints, or any other feedback, please contact us at [anz@thinkstep-anz.com](mailto:anz@thinkstep-anz.com).

# Table of Contents

Table of Contents .....	3
Introduction.....	5
1.1. Motivation .....	5
1.2. Transparency and Independence .....	5
1.3. A Robust Basis: LCA and EPDs .....	6
1.4. Offsetting with Ekos .....	6
2. Programme Setup.....	7
2.1. Approach .....	7
3. General Programme Rules .....	9
3.1. Roles in Steel Product Carbon Offset Programme .....	9
3.2. Programme Branding.....	10
3.3. Ekos Zero Carbon Products Programme Instructions .....	10
3.4. Data Collection .....	10
3.5. Calculations .....	10
3.6. Offsetting Process .....	11
4. Calculation Methodology.....	12
4.1. General Principles .....	12
4.2. Definitions.....	12
4.3. Use of Life Cycle Assessment and Environmental Product Declarations .....	13
4.4. Products without upstream LCA or EPD Data.....	14
4.5. Product Category Rules.....	14
4.6. System Boundary and End of Life Assumptions .....	15
4.7. Fabrication Emissions (Additional A3 emissions).....	16
4.8. Transportation and Installation Emissions (A4 and A5).....	16
5. Product-Specific Guidelines .....	17
5.1. Roll-Formed Roofing and Cladding .....	17
5.2. Heavy Structural Steel Products .....	19

5.3.	Light Steel Framing Products.....	21
5.4.	Steel Reinforcing Products .....	23
5.5.	Semi-Finished Steel Products - (Excluding construction products) .....	24
5.6.	Stainless Steel Finished Products.....	26
6.	Training and Communication .....	28
6.1.	Roles for Communication.....	28
6.2.	Making public statements about carbon offsetting .....	28
6.3.	Where to find further information:.....	29
7.	Ekos Carbon Certification for Products .....	30
7.1.	Process for Programme Administration.....	30
7.2.	Inventory.....	32
7.3.	Offsetting carbon .....	35
7.4.	Communications.....	37
Annex A:	Emission Factors .....	40
	Roll-Formed Roofing and Cladding .....	40
	Heavy Steel Products.....	42
	Light Steel Framing .....	43
	Reinforcing Steel Products .....	44
	Semi-Finished Products .....	46
	Stainless Steel Finished Products .....	47

# Introduction

## 1.1. Motivation

---

HERA and its member organisations are mindful of the impact of metal products and services on climate change, and the rising public awareness of the issue.

Globally, the iron and steel Industry is responsible for around 6.7 % of all CO<sub>2</sub> emissions, while New Zealand's steel industry accounts for 2.2 % of New Zealand's carbon emissions. There are also significant volumes of steel imported and used in manufacturing, construction and infrastructure.

With New Zealand's commitment to a Carbon Zero target by 2050, reducing the Industry's emissions is important, but that this is only part of the challenge. Carbon is primarily used in the steel making process as a reductant (rather than an energy source). Although there is research into alternative reductants (e.g. hydrogen), currently no commercially viable alternative exists for coal. Therefore, until such an alternative is developed, it is important for the industry to utilise carbon offsetting as a mechanism to reduce net emissions. The Steel Industry Carbon Offset Program has been developed to provide a robust carbon offsetting programme for the steel Industry within New Zealand, with a preference for the offsets to be focused on the domestic planting of native New Zealand trees (i.e. to provide additional biodiversity and human capital benefits to New Zealand society). HERA is the facilitator of the offsetting process and has partnered with Ekos to administer the programme.

Given the diverse membership of HERA, with a range of product types using a mix of local and imported steel, a staged approach to implementation will be undertaken. An overlying programme has been created, with instructions and specific rules for each product category as outlined in this document. The rules are intended to apply to both carbon and stainless steel products identified within each product category.

## 1.2. Transparency and Independence

---

These rules have been developed by thinkstep-anz in consultation with HERA. thinkstep-anz is an independent, New Zealand-based company that assesses and advises on sustainability. thinkstep-anz is a member of the New Zealand Green Building Council, Life Cycle Association of NZ and has extensive experience conducting LCAs and creating EPDs in the steel sector in Australasia. HERA is an independent research association and has no vested interest in supporting one steel product, supplier or manufacturer above another. The rules will be maintained by HERA, and hosted on the HERA website to ensure public access and transparency.

### 1.3. A Robust Basis: LCA and EPDs

---

The offsetting calculations in this programme are based on life cycle assessment (LCA) and environmental product declarations (EPDs). This is a cornerstone of the programme, because:

- EPDs provide a **consistent and comparable** way to quantify a product's carbon footprint, along with other environmental footprints.
- EPDs are recognised by offsetting programmes, such as Australia's National Carbon Offset Standard (NCOS), as one of the key ways to calculate a carbon footprint, providing a **path towards carbon neutrality**.
- **EPDs provide additional benefits** to a company, being used for marketing and recognised by green building schemes such as Green Star and ISCA.
- LCA results, including carbon footprint, provide a **comprehensive, science-based assessment** of the environmental performance of products.

### 1.4. Offsetting with Ekos

---

- Ekos is a New Zealand social enterprise that **grows and protects indigenous forests**, developing sustainable development outcomes in rural communities (thus contributing to the natural, social and human capital categories of Treasury's Living Standards Framework).
- Ekos's carbon credits arise from establishing new forests and protecting existing forests indefinitely from logging. These conservation activities create **measured, reported and verified carbon benefits**.
- The forests provide environmental benefits from **sustainable land management, waterways protection, and biodiversity conservation**.
- They also provide **self-sustaining income for landowning communities**, by covering the lost income that would have come from farming or logging the same land.
- Ekos is recognised as a credible carbon offsetting scheme by ConsumerNZ<sup>1</sup>.
- Ekos are in the process of becoming certified under ISO 14065 (Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition) and are aiming to achieve verification in 2021.

---

<sup>1</sup> <https://www.consumer.org.nz/articles/carbon-offset-schemes>

## 2. Programme Setup

### 2.1. Approach

---

The approach used to develop the programme comprised:

1. Develop programme implementation process
  - a. Assign roles
  - b. Develop Programme Instructions
  - c. Determine the practical implementation steps
2. Develop calculation methodology
3. Work with Ekos to implement web-based offset calculator
4. Training and communication for those using the calculator

This approach is described in more detail below.

#### **Roles**

The roles of thinkstep, HERA, Ekos, and other parties in the development of this programme and the ongoing programme usage/administration are defined in these Programme Instructions.

#### **Develop Programme Instructions (this document)**

The Steel Product Carbon Offset Programme Instructions are based on existing documents where applicable, including the General Programme Instructions for the Ekos Zero Carbon Certification for Products (currently in draft form) and published product category rules.

These Programme Instructions clearly define:

- The roles of HERA, Ekos, and HERA members, as well as any committees or consultants who may review/approve data or reports used for calculations or public communication
- The types of data that may be used as a basis for carbon calculations
- How additional carbon is calculated where an EPD exists for an interim product
- How data is collected and what reporting and documentation is required for the programme
- How small manufacturers/fabricators can offset the emissions for their processes or products (if a full LCA is not required or possible)
- Communication guidance to allow manufacturers to remain compliant with all standards and laws

A sub-set of guidance has been developed for each product type (e.g. roll-formed roofing/cladding, light steel framing, stainless steel etc), to clearly define any further requirements specific to the Industry. This includes:

- Industry-specific rules for data collection and carbon calculation

- A functional unit appropriate to the product and accessible all stakeholders (e.g. kg or m<sup>2</sup>)
- Estimated average emission factors for processes not included in EPDs or LCA data (e.g. fabrication)

### **Practical implementation steps**

The practical implementation steps were discussed between HERA, Ekos and thinkstep-anz, and comprised of:

- Data collection (EPD and LCA research, and engagement with industry)
- Completion of draft programme rules and calculator
- Consultation with industry to review draft rules and calculator
- Final changes and creation of online training resources
- Release of working calculator and final programme rules

### **Calculation Methodology (Included in this document)**

The standardised calculation methodology ensures clear guidance for all stakeholders in the supply chain across all products covered in this programme. An industry-specific calculation methodology has been created for each product category as required, and draws upon existing product category rules where appropriate. The product categories covered in these Programme Instructions are:

- Steel roofing and cladding (roll-formed products)
- Heavy Structural steel products (beams, columns)
- Light Structural Steel Products (light steel framing)
- Steel reinforcing products (rebar, wire and mesh)
- Semi-finished or intermediate steel products - (excluding construction products)
- Finished fabricated steel products – (excluding construction products)

A transportation emission calculation methodology is also included.

### **Offsetting**

Ekos enables offsetting through their website. The practical implementation of this is discussed in these programme rules.

### **Training and Communication**

Online training has been prepared by HERA for those who wish to use the calculator. HERA will continue to develop general tools and communications to ensure stakeholders know how to use the calculator, can explain the programme to customers, and know how to correctly refer to the programme. This is crucial to ensure compliance with Commerce Commission requirements<sup>2</sup> for making accurate claims and to ensure the programme is used responsibly. However, HERA will not be responsible for developing tools and communications that specifically promote a particular product. It will be up to individual suppliers, manufacturers and distributors to develop their own material to promote their own products.

---

<sup>2</sup> <https://comcom.govt.nz/business/dealing-with-typical-situations/making-accurate-claims>



## 3. General Programme Rules

### 3.1. Roles in Steel Product Carbon Offset Programme

The roles in the programme are outlined in Table 3-1 below.

**Table 3-1: Roles in the Steel Product Carbon Offset Programme**

Organisation(s)	Role
<b>HERA</b>	<p>Organiser and main overseer of the programme. HERA is responsible for:</p> <ul style="list-style-type: none"> <li>• Reviewing and adjusting Programme Rules and Instructions</li> <li>• Authorising organisations to use this programme</li> <li>• Designating the product category rules, LCAs, EPDs, and other data that can be used for calculations in this programme</li> <li>• Authorising guidance documents and communications related to this programme, and maintaining access to these through the HERA website</li> </ul>
<b>thinkstep-anz</b>	Creating programme rules and advising on implementation of the programme in conjunction with HERA and Ekos,
<b>Ekos</b>	Management and purchase of offsets under this programme, and ensuring that the web calculator, purchase process and receipts/certification are correctly and reliably carried out.
<b>Primary steel manufacturers</b>	Communication of programme to clients and downstream manufacturers, and ensuring calculations are correct (using HERA-approved information) for all primary products.
<b>Steel product distributors</b>	Communication of programme to fabricators and installers (and consumers, where appropriate), and ensuring calculations are correct (using HERA-approved information) for all primary products.
<b>Fabricators and installers</b>	Communication of programme to consumers, (and end-users if appropriate) and ensuring calculations are correct (using HERA-approved information) for all primary products.
<b>Consumers</b>	Purchaser of offsets – the consumers will have the option to purchase offsets for their particular projects.

## 3.2. Programme Branding

---

This programme is branded as the Steel Product Carbon Offset Programme.

## 3.3. Use of Ekos Zero Carbon Products Programme Instructions

---

These Programme Instructions are to be used alongside the Ekos 'General Programme Instructions for Products', currently in draft format. The Ekos General Program Instructions for Products can be referred to for specific details on the operator of the programme, the standards to which it conforms, and details on complying with the EPD and LCA data requirements of this programme.

Note that the Ekos programme instructions are intended for those manufacturers that choose to measure, reduce, offset and report their emissions, and relate to production of a product over an entire year. **The Steel Product Carbon Offset Programme relates only to the sections of the Ekos programme instructions included in section 7 of these Programme Instructions.**

The Steel Product Carbon Offset Programme adds calculation methodology, Industry-specific guidance, and training and communication guidelines. Please read this Programme Instructions document first, and refer to the Ekos programme instructions for technical details if needed.

## 3.4. Data Collection

---

Data must be collected and recorded for every instance of carbon offsetting. This data must be kept by the organisation selling the product (to either another business or to the consumer). At a minimum, the following data points must be recorded for every offsetting instance:

- The specific type of product (manufacturer/brand and specification)
- The quantity of product (in the appropriate functional unit for the product category, i.e. m<sup>2</sup> for metal roofing, kg for other categories)
- Transport distances used for transport calculations
- The LCA data or EPD(s) that the calculations were based on in addition to these Rules.

## 3.5. Calculations

---

Carbon calculations must follow these Programme Instructions, as well as the applicable sections of the Ekos Zero Carbon Products Programme Instructions. The category-specific guidance, calculation methodology and emission factors in this document shall be used wherever applicable.

### 3.6. Offsetting Process

---

When carbon footprinting calculations have been completed (following the methodology outlined in these Instructions), emissions can be offset in one of two ways:

- 1) By the consumer, via a web portal at <https://www.hera.org.nz/resources/carbon-offsetting>. Consumers can be referred to this address with the knowledge of their purchase quantity and transport distance, and offset directly through the Ekos website. A receipt will be sent directly to the consumer.
- 2) By the manufacturer, fabricator or installer, who may use the calculator at <https://ekos.co.nz/hera-calculator> directly or by submitting their own calculations (using these Programme Instructions) to Ekos for offsetting, with approval from HERA.

### 3.7. Certification

---

The methodology and emission factors in this document have been reviewed by Ekos, and thus any offsetting that has followed the calculation methodology and instructions in this document may use the Ekos Zero Carbon (Tier 2) label on reports and receipts. Tier 2 indicates that the footprint used for offsetting is based on an estimated measurement, and that there is no reduction plan for the product (as is required for Tier 1 certification).

## 4. Calculation Methodology

### 4.1. General Principles

---

The calculation methodology is divided into subsections specific to each type of steel product included in this programme:

- Roll-formed roofing and cladding
- Heavy structural steel (beams, columns)
- Light steel framing
- Steel reinforcing (rebar, wire and mesh)
- Semi-finished or intermediate steel products (excluding construction products)
- Stainless steel finished products (excluding construction products)

### 4.2. Definitions

---

Before reading the remainder of this document, it is important to understand the following three definitions, which form the basis for all calculations:

**CO<sub>2</sub>e** or carbon dioxide equivalent, is the unit of measure for carbon emissions. Some gases have a higher contribution to climate change than carbon dioxide (for example 1 kg of methane can contribute as much as 28 kg of CO<sub>2</sub>), so units are standardised into carbon dioxide equivalents.

**Environmental life cycle assessments (LCAs)** are studies that systematically look at the environmental impacts of a product throughout its life cycle – i.e. all the way upstream to resource extraction, and all the way downstream to disposal practices. A full LCA is a *precursor* to an EPD (see below), and can be used for calculations in this programme. The only environmental indicator considered in a carbon footprint is global warming potential, measured in kg of CO<sub>2</sub> equivalents.

**Environmental Product Declarations (EPDs)** are a standardised and transparent way of communicating a range of environmental impacts for a particular product or product range. Think of them like a detailed nutrition label, but for environmental criteria. They are often published as a small booklet to provide context. These are usually published by the product manufacturer. Again - while a range of environmental impact categories are required to produce an EPD, only one is required to calculate a carbon footprint: global warming potential, measured in kg of CO<sub>2</sub> equivalents.

**Global Warming Potential (GWP)** is the only impact category used in this programme. This is an indicator of potential contribution to climate change, and is measured in kilograms (or tonnes) of CO<sub>2</sub> equivalent.

**Product Category Rule(s) (PCRs)** are documents providing rules, requirements and guidelines for developing an EPD for a specific product category (e.g. building materials).

They are used as complements to the programme instructions, *e.g.*, in terms of calculation rules, scenarios and in the EPD contents. A goal of a PCR is to enable consistent system boundaries and assumptions when developing EPDs for products in the same product category. In this way, comparisons can be made between products that serve similar functions.

### 4.3. Use of Life Cycle Assessment and Environmental Product Declarations

---

Calculations for the carbon footprint of a particular product in this programme must be based on either a life cycle assessment, or an environmental product declaration.

A life cycle assessment (LCA) study undertaken to achieve compliance in this programme must

- comply with international accepted principles for LCA according to ISO 14040 and ISO 14044;
- follow the principles, requirements and guidelines of ISO 14067 (Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification); and
- follow the general purpose of environmental declarations, the collection of data, and the methods and assumptions used as advocated in the ISO standard 14025.

If a PCR document for the product category exists in the International EPD System, that PCR should be used to guide the LCA study assumptions. The only impact category required to achieve compliance in this programme is GWP<sub>100</sub> (global warming potential over 100 years), measured in kg of CO<sub>2</sub> equivalent. Further guidance on what must be included in LCAs can be found in the General Programme Instructions – EKOS Zero Carbon Certification for Products.

The Steel Product Carbon Offset Programme recognises EPDs under the Australasian EPD Programme and the International EPD System to be consistent with the greenhouse gas calculations and requirements of the Ekos Zero Carbon Programme for Products. EPDs from other international EPD programmes recognised by the International EPD System under mutual recognition agreements may also be used. These EPDs are publicly available online at:

- [www.epd-australasia.com](http://www.epd-australasia.com) (Australasia)
- [www.environdec.com](http://www.environdec.com) (International)

EPDs exist for the following steel products manufactured in New Zealand:

**Table 4-1: EPDs for New Zealand steel products**

Product	Company
<b>AlumiGard™, MagnaFlow™ and ZinaCore™ pre-painted roofing and cladding (New Zealand)</b>	Fletcher Steel Ltd and its subsidiary Pacific Coilcoaters
<b>COLORSTEEL® ENDURA® and COLORSTEEL® MAXX®</b>	New Zealand Steel Limited
<b>SEISMIC® Steel Reinforcing Bar, Coil, Rod and Wire</b>	Pacific Steel (NZ) Limited

Other EPDs exist for products manufactured elsewhere, and it is possible to combine upstream LCA or EPD information with LCA data for processes occurring in New Zealand, to get to the final carbon footprint for a particular product or project. Other EPD and LCA emission factors are provided in these Programme Instructions in Annex A.

#### 4.4. Products without upstream LCA or EPD Data

The carbon footprint of products is based on LCA or EPD data. If offsetting is desired for a product without LCA or EPD data, and an LCA is not able to be completed, there is an alternative calculation method:

The carbon emissions can be calculated using a published EPD of a similar product, produced in the same country or region as the product in question (e.g galvanised steel roofing). If this data exists, it may be used, but **an additional 15% global warming potential impact must be added**, to account for uncertainty. Note: This factor is automatically incorporated into the online calculator when 'other' or 'average' products are selected.

#### 4.5. Product Category Rules

EPDs must be based on appropriate product category rules (PCRs).

The PCRs currently applicable to this programme are shown in Table 1. Note that some EPDs may have been produced using previous versions of or precursors to these PCRs.

**Table 4-2: Current product category rules applicable to this programme**

Reference	Title	Products Covered
<b>EN 15804:2012 +A2:2019</b>	Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.	All construction products (sub-PCRs offer additional guidance)
<b>PCR 2019:14 v1.1</b>	Construction Products	All construction products (additional guidance to EN 15804)
<b>PCR 2015:03 v2.0</b>	Basic iron or steel products & special steels, except construction steel products.	Semi-finished steels or intermediate special steels that will be further processed to become a finished consumer product
<b>PCR 2014:10 v2.11</b>	Fabricated steel products, except construction products, machinery and equipment	Finished steel products that will not be further processed. Examples of products in this (e.g. chains, bearing steels, tools, shafts, tubes, pipes)

#### 4.6. System Boundary and End of Life Assumptions

The Steel Product Carbon Offset Programme is based on a "cradle to gate" life cycle. This means that modules A1-A5 in Table 2 (shown in green) are included. These modules cover the supply chain from raw material extraction, to manufacturing, and installation, with transport also included. Not included are maintenance, repair or replacement throughout the life of the product, or end of life impacts, as these vary greatly between products and add significant complexity to the calculations.

**Table 4-3: Life cycle stages included in the Steel Product Carbon Offset Programme (green)**

Production			Installation		Use stage							End-of-Life				Next product system
Raw material supply	Transport of raw materials	Manufacturing	Transport to customer	Construction / Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to waste processing	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D

## 4.7. Fabrication Emissions (Additional A3 emissions)

---

Primary production of steel is the dominant source of emissions for steel products, however further emissions occur from fabrication (e.g. welding, plasma cutting, bending). Fabrication is not included in most EPDs or LCAs as these are for primary steel products, not finished products delivered to site. In order to ensure fabrication emissions are included, emission factors have been estimated based on consultation with fabricators in New Zealand. Specific emission calculation guidance on fabrication and installation for each product group is given within the product-specific guidelines below.

## 4.8. Transportation and Installation Emissions (A4 and A5)

---

Most of the EPDs for the steel industry include modules A1-A3 but not A4 and A5. This is because at a product-wide level, it is not possible to predict transport distances to customer, or collect data for emissions from downstream installers. Therefore, LCA data for the transport and installation of specific products is included in this guidance.

The transport emission factors for within New Zealand are taken from 2019 Ministry for the Environment guidance (Table 3). Note that the unit is "kg-km", *i.e.* one kilogram of material transported one kilometre. This factor needs to be multiplied by the distance transported as well as the weight of material transported. For metal roofing which is commonly given in m<sup>2</sup>, the densities of the products (in kg/m<sup>2</sup>) must be gathered from the manufacturer. For metal roofing products covered by EPDs at the time this document was published, densities are included within the product-specific guidelines.

**Table 4-4: Transport emission factors used in this programme**

Process	Emission Factor (kg CO <sub>2</sub> e per Source kg-km of product)	
<b>Transport by truck in New Zealand</b>	0.000136	Ministry for the Environment, 2019 <sup>3</sup> ('Road freight by truck').
<b>Ocean freight for imported products</b>	0.000012	Ministry for the Environment, 2019 <sup>3</sup> ('International shipping - general cargo, 10,000+ DWT').

---

<sup>3</sup> Ministry for the Environment. 2019. Measuring Emissions: A Guide for Organisations. 2019 Detailed Guide.



## 5. Product-Specific Guidelines

### 5.1. Roll-Formed Roofing and Cladding

#### Environmental Product Declarations

The following EPDs are available to calculate production and roll-forming emissions.

**Table 5-1: EPDs for roll-formed steel products**

Product	Company	Region
<b>AlumiGard™, MagnaFlow™ and ZinaCore™ pre-painted roofing and cladding (Colorcote)</b>	Fletcher Steel Ltd and its subsidiary Pacific Coilcoaters	New Zealand
<b>COLORSTEEL® ENDURA® and COLORSTEEL® MAXX®</b>	New Zealand Steel Limited (Bluescope)	New Zealand
<b>COLORSTEEL Addendum – Roll-forming Data</b>	New Zealand Steel Limited (Bluescope)	New Zealand

#### Applicable Product Category Rules

EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

PCR 2019:14 Construction Products v1.0.

#### Transportation

Emissions must be calculated and offset for the transport of product from manufacturer to site, including through any intermediate processes such as cutting or shaping the product.

These emissions are calculated using emission factors in Table 3 in the Calculation Methodology section.

Note that the emission factor gives emissions per kg-km of product. You therefore must know the weight of the product per square metre to get transport emissions.

For example, if you are transporting 100 m<sup>2</sup> of COLORSTEEL® ENDURA® 0.55mm (which weighs 4.52 kg/m<sup>2</sup>) 350 km by truck in New Zealand, the total emissions will be calculated like so:

[m<sup>2</sup> of product] x [weight (in kg) per m<sup>2</sup>] x [distance transported by truck (in km)] x [emission factor]

$$= 100 \times 4.52 \times 350 \times 0.000136$$

$$= 21.5 \text{ kg CO}_2\text{e}$$

## Fabrication and Installation

For projects *using less than 200m<sup>2</sup> of product* (i.e. residential and small commercial projects), the impact of fabrication and installation is expected to be immaterial (<0.5% of total emissions), based on discussion with manufacturers.

For projects *above 200 m<sup>2</sup> of product*, the likelihood that machinery such as a crane truck, generator, forklift or scissor lift is higher, as this represents larger commercial and industrial installations.

Modelling fuel use for installation, a Franna MAC 25 crane truck with Hino H07C-T engine was used as a representative vehicle<sup>4</sup>. This machine uses 21.7 litres of fuel per hour on average. Using Ministry for the Environment emission factors for stationary combustion, the emission factor would be 2.66 kg CO<sub>2</sub>e per litre of diesel combusted. Therefore the emissions per hour would be:  $21.7 \times 2.66 = 57.72$  kg CO<sub>2</sub>e per hour

Based on discussion with manufacturers, it is estimated that one hour of crane usage would be a suitable conservative estimate per 200m<sup>2</sup> of roofing installed.

Therefore, for installation, the additional emissions for projects greater than 200m<sup>2</sup> are:  $57.72 / 200 = 0.29$  kg CO<sub>2</sub>e per m<sup>2</sup> roofing installed. This emission factor is included in Annex A alongside the production emission factors.

## Calculation Steps

The total carbon footprint shall be calculated by:

- 1) Using LCA or EPD data to calculate the impact per m<sup>2</sup> of production of the specific product, (modules A1 – A3 in Table 2), and multiplying by the m<sup>2</sup> of product used. Ensure that roll-forming is included; for COLORSTEEL products it is provided in an addendum.
- 2) Using the methodology and emission factors in these Programme Instructions to calculate the transportation and installation emissions of the specific product (A4 and A5 in Table 2), based on the weight and transport distance of the product
- 3) Adding the results of steps 1 and 2 to arrive at a total footprint.

---

<sup>4</sup> <https://www.terex.com/docs/librariesprovider22/fuel-consumption/fuel-consumption-site-mac-25-hino-engine.pdf>

## 5.2. Heavy Structural Steel

### Environmental Product Declarations

No EPDs exist for New Zealand-produced heavy structural steel. As a proxy, another steel product (reinforcing bar) can be used with a conservative increase of GWP of 15%. There are currently two EPDs for welded and hot rolled products from Australia.

**Table 5-2: EPDs for heavy structural steel**

Product	Company	Region
SEISMIC® reinforcing bar, coil, rod and wire [PROXY]	Pacific Steel	New Zealand
Welded Beams and Columns	Bluescope Steel	Australia
Hot Rolled Structural Sections and Merchant Bar	Infrabuild	Australia

### Life Cycle Inventory Data

For product imported from Asia, emission factors from WorldSteel's latest database are used.

**Table 5-3: Life Cycle Data for heavy structural steel**

Product	Source	Region
Heavy Steel Sections	WorldSteel 2019 Dataset	Asia (Regional average)

### Applicable Product Category Rules

EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

PCR 2019:14 Construction Products v1.0.

### Fabrication, Installation and Transport

Fabrication of heavy steel involves processes such as sawing, drilling, thermal cutting, plasma cutting, and preheating. The amount of energy required depends on many factors, including if the sections are classed as light, medium or heavy. Weights per metre for each class and associated emission factors are given in Annex A.

Emissions for painting and abrasive blasting have not been included as reasonable data was unable to be found. These processes are expected to have an immaterial contribution to GWP, as energy use is minimal in comparison with other life cycle stages.

Installation typically involves a crane or crane truck to lift sections into place. Modelling fuel use for installation, a Franna MAC 25 crane truck with Hino H07C-T engine was used as a representative vehicle<sup>5</sup>. This machine uses 21.7 litres of fuel per hour on average. Crane usage is estimated (through consultation with industry) as 0.56 hours per tonne of steel installed. Ministry for the Environment emission factors for stationary combustion give an

<sup>5</sup> <https://www.terex.com/docs/librariesprovider22/fuel-consumption/fuel-consumption-site-mac-25-hino-engine.pdf>

emission factor of 2.66 kg CO<sub>2</sub>e per litre of diesel combusted. Therefore the emissions per kg of steel are:  $21.7 \times 2.66 \times 0.56 / 1000 = 0.032$  kg CO<sub>2</sub>e per kg of steel installed. This emission factor is also included in Annex A.

### **Calculation Steps**

The total carbon footprint shall be calculated by:

- 1) Use LCA or EPD data to calculate the impact per kg of production of the specific product (see Annex A).
- 2) Using the methodology and emission factors in these Programme Instructions to calculate the fabrication, transportation and installation emissions of the specific product, based on the weight and transport distance of the product
- 3) Adding the results of steps 1 and 2 to arrive at a total footprint.

## 5.3. Light Steel Framing

This category includes light steel framing for residential applications.

### Environmental Product Declarations

An EPD for light steel framing produced in New Zealand has not been published at the time of publication of this document. Until this exists, a proxy must be used.

The following proxies (with upscaling of 15%) are recommended to achieve a total emission factor per kg for light steel framing;

- Primary steel production (Production of reinforcing bar in New Zealand)
- Rolling and forming (Roll-forming of steel roofing products in New Zealand)
- Galvanising (Hot dip galvanising in Australia)

The applicable EPDs are shown in Table 7.

**Table 5-4: EPDs for light structural steel**

Product	Manufacturer	Region
<b>SEISMIC® reinforcing bar, coil, rod and wire [PROXY]</b>	Pacific Steel	New Zealand
<b>COLORSTEEL® Addendum - Rollforming Data [PROXY]</b>	New Zealand Steel Limited (Bluescope)	New Zealand
<b>Hot Dip Galvanizing in Australia</b>	Galvanizers Association of Australia	Australia

### Product Category Rules

EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

PCR 2019:14 Construction Products v1.0.

### Fabrication, Installation and Transport

Fabrication and installation of light steel products are expected to be immaterial, based on discussions with industry professionals.

Transport emissions must be calculated and offset for the transport of product from manufacturer to site, including through any intermediate processes such as cutting or shaping the product. These emissions are calculated using emission factors in Table 3 in the Calculation Methodology section.

### Calculation Steps

The total carbon footprint shall be calculated by:

- 1) Use LCA or EPD data to calculate the impact per kg of production of the specific product (see Annex A).

- 2) Using the methodology and emission factors in these Programme Instructions to calculate the transportation emissions of the specific product, based on the weight and transport distance of the product
- 3) Adding the results of steps 1 and 2 to arrive at a total footprint.

## 5.4. Steel Reinforcing

### Environmental Product Declarations

Table 5-5: EPDs for reinforcing products

Product	Company	Region
<b>Pacific Steel SEISMIC® reinforcing products</b>	Pacific Steel	New Zealand
<b>Steel reinforcing bar and mesh</b>	Australian Reinforcing Company	Australia
<b>Reinforcing bar and mesh</b>	Infrabuild Construction Solutions	Australia
<b>Reinforcing rod, bar &amp; wire</b>	Infrabuild Steel	Australia

### Product Category Rules

EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

PCR 2019:14 Construction Products v1.0.

### Fabrication, Installation and Transport

Fabrication of reinforcing involves heating and bending product to specification. Because Fletcher Reinforcing track carbon emissions across all sites, the total emissions for fabrication per kg of product was able to be calculated. This emission factor is 0.011 kg CO<sub>2</sub>e per kg of finished reinforcing product.

Transport emissions must be calculated and offset for the transport of product from manufacturer to site, including through any intermediate processes such as cutting or shaping the product. These emissions are calculated using emission factors in Table 3 in the Calculation Methodology section.

### Calculation Steps

- 1) Use LCA or EPD data to calculate the impact per kg of production of the specific product (see Annex A).
- 2) Using the methodology and emission factors in these Programme Instructions to calculate the transportation emissions of the specific product, based on the weight and transport distance of the product
- 3) Use the reinforcing fabrication emission factor in these Programme Instructions to add emissions from fabrication.
- 4) Add the results of steps 1, 2 and 3 to arrive at a total footprint.

## 5.5. Semi-Finished or Intermediate Steel Products - (Excluding construction products)

This category applies to UN CPC codes 412, 421, 422, 423 and 429 (semi-finished steels or intermediate special steels that will be further processed to become a finished consumer product). Examples of products in this category are ingots, blooms, slabs, plates, rolled products (wire rods, bars, flats, billets), cold finished (cold-drawn, peeling/turning and straightening) and basic forged products (bars and flats) in carbon steels, free cutting steels, alloyed steels, spring steels, microalloyed steels, cold forming steels, bearing steels, etc.

### Environmental Product Declarations

**Table 5-6: EPDs for semi-finished or intermediate products**

Product	Company	Region
Steel - Hot Rolled Coil	Bluescope Steel	Australia
XLERPLATE® Steel	Bluescope Steel	Australia

### Life Cycle Inventory Data

For product imported from Asia, emission factors from WorldSteel's latest database are used.

**Table 5-7: Life Cycle Data for semi-finished or intermediate steel products**

Product	Source	Region
Hot rolled coil	Worldsteel	Asia (Average)
Hot-dip galvanised coil	Worldsteel	Asia (Average)
Electroalgalvanised coil	Worldsteel	Asia (Average)
Engineering Steel	Worldsteel	Asia (Average)

### Product Category Rules

PCR 2015:03 – Basic iron or steel products & special steels, except construction steel products. v2.0.

EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

PCR 2019:14 Construction Products v1.0.

### Fabrication, Installation and Transport

In this category, fabrication is highly dependent on the product, and emission factors cannot be included here. It is recommended that for fabrication, actual electricity and fuel use is estimated, and emissions calculated using emission factors from the Ministry for the Environment publication 'Measuring Emissions: A Guide for Organisations. 2019 Detailed Guide', available publicly online.

Transport emissions must be calculated and offset for the transport of product from manufacturer to site, including through any intermediate processes such as cutting or



shaping the product. These emissions are calculated using emission factors in Table 3 in the Calculation Methodology section.

### **Calculation Steps**

- 1) Use LCA or EPD data to calculate the impact per kg of production of the specific product (see Annex A).
- 2) Use the methodology and emission factors in these Programme Instructions to calculate the transportation emissions of the specific product, based on the weight and transport distance of the product
- 3) Estimate fuel and electricity use for fabrication, and then use emission factors from the Ministry for the Environment to calculate estimated emissions from fabrication.
- 4) Add the results of steps 1, 2 and 3 to arrive at a total footprint.

## 5.6. Stainless Steel Finished Products

This product category corresponds to UN CPC codes 412 (for finished products), 422 (Tanks, reservoirs and containers of iron, steel or aluminium) and UN CPC 429 (Other fabricated metal products). These products should be **finished steel products** that will not be further processed.

Some of the EPDs and LCA information will have been prepared with construction uses in mind; this should not affect outcomes provided there are no significant calculation differences between the EPDs and LCAs. The EPDs and LCA data below has been checked to ensure the same life cycle stages are included.

### Environmental Product Declarations

**Table 5-8: EPDs for stainless steel products**

Product	Company	Region
<b>Cold Rolled Stainless Steel</b>	Outokumpu Oyj	International (based on data from plants in Germany, Sweden, Finland, USA and Mexico)
<b>Hot Rolled Stainless Steel</b>		
<b>Stainless Steel Long Product</b>		
<b>Welded and pickled stainless steel product</b>		

### Life Cycle Inventory Data

For (non-stainless) product imported from Asia, carbon emissions can be sourced from Worldsteel. For stainless imported products, regional averages can be used from the International Stainless Steel Forum (ISSF).

**Table 5-9: Life Cycle Data for upstream inputs for finished fabricated steel products**

Product	Source	Region
<b>Stainless Steel Product</b>	International Stainless Steel Forum LCA Data	Global

### Product Category Rules

PCR 2014:10 Fabricated steel products, except construction products, machinery and equipment v2.11.

Institut Bauen und Umwelt e.V., Berlin (pub.): PCR Guidance Texts for Building Related Products and Services, Part B: Requirements on the EPD for Structural Steels. 2017

EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

### Fabrication and Installation

In this category, fabrication is highly dependent on the product, however average emission factors have been included in Annex A, based on energy and fuel use by two New Zealand fabricators. If possible, actual electricity and fuel use should be measured or estimated, and

emissions calculated using emission factors from the Ministry for the Environment publication 'Measuring Emissions: A Guide for Organisations. 2019 Detailed Guide', available publicly online. Installation emission data was unavailable at the time of publication, but is not expected to be material.

### **Transport Emissions**

Transport emissions must be calculated and offset for the transport of product from manufacturer to site, including through any intermediate processes such as cutting or shaping the product. These emissions are calculated using emission factors in Table 3 in the Calculation Methodology section.

### **Calculation Steps**

- 1) Use LCA or EPD data to calculate the impact per kg of production of the specific product (see Annex A).
- 2) Use the methodology and emission factors in these Programme Instructions to calculate the transportation emissions of the specific product, based on the weight and transport distance of the product
- 3) Estimate fuel and electricity use for fabrication, and then use emission factors from the Ministry for the Environment to calculate estimated emissions from fabrication. Average emission factors in Annex A may be used in the absence of this data.
- 4) Add the results of steps 1, 2 and 3 to arrive at a total footprint.

## 6. Training and Communication

### 6.1. Roles for Communication

---

HERA's role in communication related to this programme is to provide communication material for its members to ensure there is consistent messaging around the programme. Examples of material can include:

- General statements about the programme
- How an independently developed and verified programme increases trust and transparency
- Guidance for manufacturers and fabricators on how they can communicate the benefits of offsetting their carbon emissions to consumers

HERA may also choose to publish offsetting statistics based on this programme.

### 6.2. Making Public Statements about Carbon Offsetting

---

Using the correct language when referring to carbon emissions and carbon offsetting is crucial to remain compliant with this programme and with Commerce Commission requirements relating to factual and evidence-based product claims.

Some examples of suggested language for communication of this programme are below:

**The Programme:** *The Steel Sector Carbon Offset Programme was developed by HERA, an independent research association providing support to the metals industry in New Zealand, in consultation with thinkstep-anz, a company with over 15 years of local sustainability expertise. Calculations are based on rigorous scientific data and follow international standards. Find out more at [www.hera.org.nz/resources/carbon-offsetting](http://www.hera.org.nz/resources/carbon-offsetting)*

**Purchased Offset Communication:** *The carbon emissions from the production, transportation and installation of [amount] of [Steel product name] have been offset. The offsets are certified carbon credits from Ekos' projects to grow and protect forests in Aotearoa and the Pacific Islands, and will be retired on the appropriate third party register. This material is now Zero Carbon.*

**Certified Product Communication:** *(Business name) is proud to have certified (Product XXXX) as a Zero Carbon product (Tier 2) with Ekos. We have measured and offset the carbon footprint of (product XXX) which included the following activities (XYZ). These certified carbon credits are sourced from projects that grow and protect forests in Aotearoa and the Pacific Islands and help to deliver climate resilience, waterways protection, erosion control, biodiversity conservation and community economic development."*

Please refer to the 'Definitions' section of these Programme Instructions for clarification on any of the terms used.

### 6.3. Where to Find Further Information:

---

Further information about this programme can be found on the HERA website at: [www.hera.org.nz/resources/carbon-offsetting](http://www.hera.org.nz/resources/carbon-offsetting)

For questions about having your products included in this programme, please contact HERA at [carbon@hera.org.nz](mailto:carbon@hera.org.nz)

For further information about conducting a life cycle assessment or publishing an environmental product declaration for your product, please visit [www.thinkstep-anz.com](http://www.thinkstep-anz.com).

For further information about the offsets used in this programme, please visit [www.ekos.org.nz](http://www.ekos.org.nz).

## 7. Ekos Carbon Certification for Products

Please note, the following section is a facsimile of relevant parts of the Ekos Programme Instructions for Products. These instructions are currently in draft, and once certified will be available on the Ekos website. As a consequence, they are subject to change. Once the instructions have been finalised this section will be updated to include the latest data from Ekos.

### 7.1. Process for Programme Administration

---

#### 7.1.1. General Programme Instructions

The Programme Operator shall prepare, maintain and communicate the General Programme Instructions for Products, and ensure that they are followed.

Older versions of The General Programme Instructions for Products shall be valid in parallel with a new version during a transition period. Information about this shall be published on the Ekos website.

#### 7.1.2. Publication of EPDs and CF-PCRs

Any new EPDs developed for the purposes of achieving a Carbon Declaration under the Ekos Carbon Management for Products Programme shall be registered in the Australasian EPD programme at [www.epd-australia.com](http://www.epd-australia.com).

#### 7.1.3. Website

The website of the Ekos Carbon Management for Products Programme and Ekos General Programme Instructions for Products shall be [www.ekos.org.nz](http://www.ekos.org.nz). The website shall be kept up-to-date with information about the Programme and shall provide explanatory material, including the Programme Instructions. Communication via the website should be complemented by other communication channels, such as a newsletter and social media.

#### 7.1.4. Feedback or Complaints

It is possible to contact the Certification Body with feedback or complaints of registered and published declarations, other documents published by the programme or the appointment of individual verifiers.

Such a complaint shall:

- Not be anonymous.
- Contain a clear description of the scope and nature of the complaint.
- Contain a clear reference to the rule or guideline in the General Programme Instructions, relevant standard, or reference that is the topic of the complaint.

The Certification Body shall respond to any complaints within 10 working days of receiving a complaint, notifying the complainant that a complaint has been received and registered with the Certification Body, will be investigated by the TC within 12 weeks of receiving the complaint, and communicated back to the complainant within 10 working days of the TC complaint review.

The TC shall notify the Certification Holder (the party to which the complaint has been directed) within 5 working days of receiving a complaint.

The TC shall investigate the complaint in the manner of an audit procedure numbering each material element of the complaint and sending the complaint to the certification holder for response. The TC shall review each complaint element and present each complaint element to the certification holder one or more of the following requests:

- Clarification Request (CL) to the Certification Holder.
- Corrective Action Request (CAR) to the Certification Holder.
- Forward Action Request (FAR) to the Certification Holder.

Upon receiving a response from the certification holder, the TC shall evaluate each response in the manner of an audit and if satisfied with the response shall mark the element as closed. Should the TC receive a response from the certification holder that it does not deem as satisfactory, the TC shall re-issue a CL, CAR, or FAR to the certification holder for a subsequent round of due diligence.

The complaint is not considered closed until each complaint element has been responded to in a manner that enables the TC to declare such element closed.

The TC shall send a Complaint Review Report to the complainant containing the complaint procedure documentation including the final responses by the certification holder and the judgement of the TC on its status as closed.

If the complaint response by the certification holder is deemed unsatisfactory by the TC, and if attempts to generate Corrective Actions and/or Forward Actions fail, the TC shall notify the certification holder that certification shall be suspended until such time as the complaint response is deemed adequate by the TC. Suspension of certification is notified directly to the certification holder and the public record of certification is removed from the Ekos website.

Suspension of certification includes an instruction to the certification holder to cease and desist from making any carbon-related claim that is subject to the certification in question until such time as the complaint has been remedied by the certification holder to the satisfaction of the TC.

#### **7.1.5. Avoiding misuse**

The Certification Body shall strive to avoid misuse of the programme and its certification trademarks or logotypes, ISO 14025 and information in the declarations registered in the programme, e.g.:

- According to ISO 14025, Type III environmental declarations are subject to the administration of a Programme Operator. Information shall be available on the Ekos website to state this requirement.

- Any Ekos Carbon logotype is only available to entities that are certified by the Ekos Certification Body. The certification trademark is not available for products and services that self-declare against the Product & Service Standard.
- Any Ekos Carbon logotype is not a Type I environmental label and should not be used in a way that may confuse it as such. Using the logotype separately with no other information is therefore only permitted on official documents prepared within the framework of the Ekos Carbon Management for Products Programme. Other ways of using the logotype separately may be accepted after approval by the Certification Body.
- Any Ekos Carbon Declaration is not a Type III environmental declaration as it only refers to one area of concern. The communication needs to be limited to carbon communication.

A Certification Aspirant that has received certification by the Certification Body is permitted to make use of an Ekos Environmental Label (or logotype) in the following ways: On official documents such as on letter heads, envelopes, email signatures, websites, product labels. In some cases, a Certification Aspirant may want to include a more explanatory and informative text describing what an EPD is and its main intent. The Certification Body shall be consulted to accept such a text.

## 7.2. Inventory

---

The first step towards certification is establishing a carbon inventory that measures the greenhouse gas (GHG) emissions associated with the product.

There are two methodological tracks for product carbon footprint measurement described below.

### 7.2.1. Two Methodological Tracks: EPD & LCA

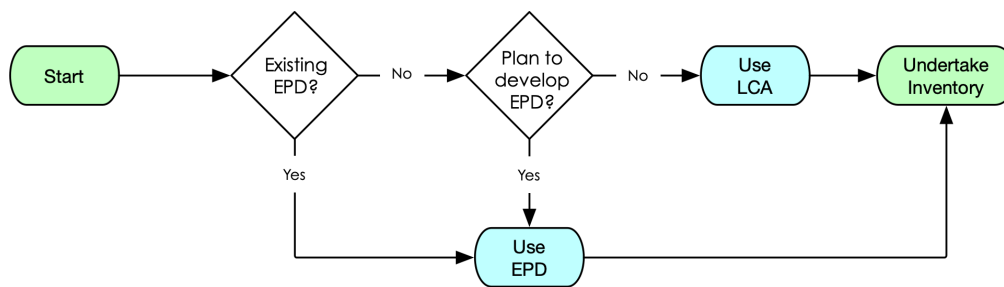
To be certified in this programme, certification applicants need to measure the product GHG emissions in one of two ways: either through the carbon element of an environmental product declaration (EPD) or through the carbon element of an environmental life cycle assessment (LCA).

Environmental Product Declarations (EPDs) are a standardised and transparent way of communicating a range of environmental impacts of goods and services. Think of them like a detailed nutrition label, but for environmental criteria. An EPD is a short version of a full Life Cycle Assessment (LCA) study that has been third-party verified. The LCA study follows specific rules for the relevant product category known as the Product Category Rules (PCR).

Environmental life cycle assessments (LCAs) are studies that systematically look at the environmental impacts of a product throughout its life cycle – i.e. all the way upstream to resource extraction, and all the way downstream to disposal practices. A full LCA is a precursor to an EPD. While a range of environmental impact categories are required to produce an EPD, only global warming potential (i.e. a carbon footprint) is required for Ekos carbon certification.

Certification aspirants can use the diagram below to determine which methodological track:





## 7.2.2. Track 1: Environmental Product Declaration (EPD) Path

### Measurement Using an EPD

All data presented in an EPD are determined using a standardised life cycle assessment methodology against Product Category Rules (PCR), allowing readers to readily interpret the environmental performance of a product or service. Producing an EPD is a detailed and time-consuming process but results in a document that is universally understandable and can be used to become a preferred supplier in certain industries. This is a document that can be used for much more than carbon certification.

In New Zealand and Australia, the Australasian EPD Programme registers and publishes independently verified EPDs. The Programme operates according to ISO 14025, the General Programme Instructions of the International EPD System and an Australasian Regional Annex. This arrangement, and the access it provides to the PCRs developed by the International EPD system, provides a harmonised and efficient global platform for communicating credible environmental information.

All EPDs registered with the Australasian EPD Programme are publicly available and free to download at [www.epd-australasia.com](http://www.epd-australasia.com). All EPDs registered with the International EPD System are publicly available at [www.environdec.com](http://www.environdec.com).

Product Category Rules (PCR) are documents providing methodologies, rules, requirements and guidelines for developing an EPD for a specific product category (e.g. building materials). They are used as complements to the programme instructions (e.g. in terms of calculation rules, scenarios and in the EPD contents). A goal of a PCR is to enable consistent system boundaries and assumptions when developing EPDs for products in the same product category. In this way, comparisons can be made between products that serve similar functions.

### Acceptable EPDs

Ekos recognises EPDs registered under the Australasian EPD Programme and the International EPD System to be consistent with the greenhouse gas calculations and auditing requirements of the Ekos Carbon Management for Products Programme.

### Choosing a Product Category

All available product category rule documents can be found at <https://www.environdec.com/PCR/>. If in doubt about the appropriateness of a particular

PCR to your product, certification applicants can contact either EPD Programme or Ekos for clarification.

If no existing PCR is identified for the product category, the PCR shall be developed and registered under the Australasian EPD Programme, following the guidelines of the appropriate requirements set out in the General programme instructions of the International EPD® System, including content, maintenance and data validity requirements.

### **Using an EPD for Carbon Measurement**

A required category within an EPD is global warming potential GWP100 (global warming potential over 100 years), measured in kg of CO<sub>2</sub> equivalent. To be certified in this programme, certification applicants must include this value for your product across all reported life cycle stages in the EPD, describing the reasons behind any choices that need to be made (for example, the default end-of-life scenario for a product).

### **7.2.3. Track 2: Life Cycle Assessment (LCA) Path**

#### **Steps to Conduct an LCA**

An environmental LCA involves four steps:

1. Boundary definition: define the goal and scope of the study.
2. Inventory analysis: gathering all of the data in inputs and outputs.
3. Impact assessment: calculating the environmental impact of your product (in this case, looking only at carbon).
4. Interpretation: Discussing results, uncertainties, and improvement possibilities.

To achieve compliance with this programme, the LCA shall follow the detailed requirements below.

#### **Detailed Requirements**

A life cycle assessment (LCA) study undertaken to achieve compliance in this programme should:

- Comply with international accepted principles for LCA according to ISO 14040 and ISO 14044.
- Follow the principles, requirements and guidelines of ISO 14067 (Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification).
- Follow the detailed requirements of an applicable PCR.

If a PCR document for the product category exists in the International EPD System or under the Ekos Programme, that PCR shall be used to guide the LCA study assumptions.

If no PCR for the product category exists, one needs to be developed by the certification aspirant in line with the requirements of ISO/TS 14027 and registered with Ekos as a PCR for carbon, or if applicable as a PCR with the International EPD System. The only impact category required to achieve compliance in this programme is GWP100 (global warming potential over 100 years), measured in kg of CO<sub>2</sub> equivalent.

The LCA should clearly describe:

- The goal and scope of the study, including the product life cycle, system boundary and assumptions.
- Data availability and data quality.
- The base year chosen for the analysis (to enable accounting for future improvements).

### 7.3. Offsetting carbon

---

Carbon offsetting is used to compensate for residual emissions beyond the reach of a Carbon Reduction Plan due to:

- The Carbon Reduction Plan requiring additional momentum for the supply chain actors before more ambitious reductions can occur.
- The residual emission reductions being demonstrably cost-prohibitive or impossible to reduce to zero at this time.
- The residual emission reductions being beyond the control of the product supply chain actors.
- Combination of the above.

This compensation for residual emissions not reduced 'in-house' is regarded as a measure to 'buy time' for deeper emission reductions to become possible in the future. The compensation is delivered in the form of carbon offsets that enable the product supply chain to go the extra distance and voluntarily cause emission reductions to occur outside the carbon accounting boundary of the product life cycle directly.

Carbon offsets in the Ekos Carbon Management for Products programme shall be sourced from certified carbon projects that cause multiple co-benefits including climate resilience, biodiversity conservation, community economic development enhancement.

#### 7.3.1. Cancellation of Consumed Carbon Credits

Carbon credits used for certification purposes as carbon offsets shall be cancelled or retired in a carbon registry.

The term 'cancellation' of carbon offsets is used when the certified carbon credits have been produced in a compliance carbon programme (e.g. the New Zealand Emissions Trading Scheme). This cancellation exercise shall follow the requirements that enable these carbon credits to be used as legitimate carbon offsets as determined by that jurisdiction, international voluntary offsetting guidelines, and this programme.

The term 'retirement' of carbon offsets is used when the certified carbon credits have been produced in the international voluntary carbon market system. Both 'cancellation' and 'retirement' are actions that define the carbon credits as having been consumed for their end use purpose (i.e. carbon offsetting).

Two approaches to offsetting are permitted under this programme:

1. Ex Ante Offsetting.
2. Ex Post Offsetting.

## Ex Ante<sup>6</sup> Offsetting

Ex ante involves:

Using a methodology approved under this programme to estimate emissions for a forthcoming measurement period (e.g. during Year 0 estimating Year 1 emissions prior to a Year 1 product launch).

Cancelling/retiring eligible carbon credits amounting to 120% of the estimated emission footprint for that measurement period (i.e. offsetting ex ante).

An ex post 'true-up' measurement exercise (i.e. after the measurement period – e.g. after Year 1) to report actual emissions in comparison with the *ex ante* estimated emissions to ensure that the number of cancelled eligible offset units is at least equal to actual emissions and in alignment with the carbon-related claim to be made (e.g. Zero Carbon, Climate Positive). If actual emissions measured ex post are lower than the estimated emissions, surplus carbon credits can be carried over for use as offsets in the next measurement period (e.g. as offsets for Year 2 emissions).

## Ex Post<sup>7</sup> Offsetting

Ex post offsetting involves:

Using a methodology approved under this programme to measure actual emissions for the measurement period that has already occurred and for which actual data is available.

Cancelling/retiring offset units for the measurement period after that period has occurred.

Carbon credits that are eligible to be used as carbon offsets in this programme are restricted to those that meet the following criteria:

Compliance carbon credits issued in a jurisdictional registry and cancelled in a manner that is defined as 'legitimate voluntary carbon offsets' by the jurisdiction where the carbon-related claim is to be made.

## Eligible Carbon Offsets

Carbon credits issued in an internationally recognised third-party carbon registry, and certified to one of the following standards:

- Plan Vivo.
- Verified Carbon Standard.
- Gold Standard.
- Climate Action Reserve.
- Clean Development Mechanism.
- American Carbon Registry.
- Joint Implementation.

---

<sup>6</sup> *Ex ante* refers to 'before the event'.

<sup>7</sup> *Ex post* refers to 'after the event'.

Carbon credits that are eligible to be used as carbon offsets in this programme are restricted to those derived from projects using the following activity types:

- Afforestation/reforestation into permanent continuous canopy forest that include community, biodiversity, climate resilience, and sustainable land management co-benefits.
- Improved forest management: from logged to protected forest, with community, biodiversity, climate resilience, and sustainable land management co-benefits.
- Improved forest management: from low carbon to high carbon forest, with community, biodiversity, climate resilience, and sustainable land management co-benefits.
- Avoided deforestation: from deforestation to sustainable forest management, with community, biodiversity, climate resilience, and sustainable land management co-benefits.
- Avoided deforestation: from deforestation to protected forest, with community, biodiversity, climate resilience, and sustainable land management co-benefits.

Evidence of cancellation/retirement and attribution to the certification applicant for the certification period is required as a condition of carbon certification under this programme.

## 7.4. Communications

---

There are two main components to certification communications:

1. Requirements for public reporting as a condition of certification.
2. Environmental labels and declarations.

### 7.4.1. Public Reporting

*[Requirements for public reporting as a condition of certification is covered in the main Ekos Carbon Management for Products programme rules, however is not relevant to the Steel Product Carbon Offset Program]*

### 7.4.2. Environmental Labels and Declarations

Carbon-related claims involve the certification recipient making public assertions relating to the carbon management outcome arising from carbon management certification and shall comply with ISO 14026:2017 ISO 14025:2010, ISO 14020:2000, and any laws and government guidance that apply in the jurisdiction where the claim will be made.

This applies to the use of:

- Environmental labels.
- Public declarations and statements.

The key consideration is to ensure that only valid, science-based information is provided without any “greenwashing”. Carbon communication is intended solely to promote the dissemination of credible carbon management information that is not misleading.

### **7.4.3. Scope**

Environmental labels, declarations, and public statements in the Ekos Carbon Management for Products programme provide information about a product or service in terms of the carbon element of its environmental character. Purchasers and potential purchasers can use this information in choosing the products or services they desire, based on carbon impact as well as other considerations. The provider of the product or service seeks to show that it is “doing the right thing”, and/or hopes that the environmental label, declaration, or public statement will be effective in influencing the purchasing decision in favour of the product or service. If the environmental label, declaration, or public statement has the effect of favourably influencing purchasing decisions in favour of the product or service, the market share of the product or service can increase, and other providers may respond by improving the carbon-related environmental aspects of their products or services to enable them to similar effect.

### **Objectives**

The overall goal of environmental labels, declarations, and public statements in the Ekos Carbon Management for Products programme is, through accurate and non-misleading communication of verifiable information, to encourage the demand for and supply of products and services that cause a net zero carbon economy, as a step towards a carbon negative (also called a ‘climate positive’) economy. This is designed to stimulate market-driven climate change action, and consequent private sector divestment from carbon intensive activities and reinvestment in net zero and net negative carbon activities (‘drawdown’). Ekos considers this goal as a complementary measure to necessary changes in demand by consumers (including reducing demand), and government regulation, that in aggregate are capable of facilitating a transition to a net negative carbon economy.

### **General Principles**

Environmental labels, declarations, and public statements used in the Ekos Carbon Management for Products programme shall:

- Be accurate, verifiable, relevant and not misleading.
- Be based on scientific methodology that is sufficiently thorough and comprehensive to support the claim and that produces results that are accurate and reproducible.
- Be available and provided upon request to all interested parties.
- Take into consideration all relevant aspects of the life cycle of the product.
- Not inhibit innovation which maintains or has the potential to improve environmental performance.
- Have administrative requirements limited to those necessary to establish conformance with applicable criteria and standards of the labels and declarations, and not pose an access barrier to organisations regardless of size.
- Provide detailed information on the carbon-related aspects of the product or service relevant to the environmental label or declaration, and be available to purchasers and potential purchasers from the party making the environmental label or declaration.

#### **7.4.4. Public Declarations and Statements**

Public declarations and statements made by certification recipients about the certification and underlying actions that have led to certification shall be accurate, verifiable with publicly available supporting documentation, and non-misleading. More detail in what can be said by a certified business can be found in the Ekos document communicating your carbon related claim available on request from [ekos@ekos.co.nz](mailto:ekos@ekos.co.nz).

# Annex A: Emission Factors

## Roll-Formed Roofing and Cladding

Table 7-1: Production (A1-A3) emission factors for roll-formed steel roofing and cladding

Product	Region	Manufacturer	Production Emission Factor (kg CO <sub>2</sub> e/m <sup>2</sup> )	Source	EPD Valid Until
Colorsteel Endura 0.4mm	New Zealand	New Zealand Steel	13.8	New Zealand Steel EPD S-P-01001 for Colorsteel products, and rollforming addendum	2023
Colorsteel Endura 0.55mm	New Zealand	New Zealand Steel	17.9		
Colorsteel Maxx 0.4mm	New Zealand	New Zealand Steel	14.1		
Colorsteel Maxx 0.55mm	New Zealand	New Zealand Steel	18.3		
Colorcote AlumiGard 0.7mm	New Zealand	Pacific Coilcoaters	33	Pacific Coilcoaters EPD S-P-01539 for AlumiGard, MagnaFlow and ZinaCore pre-painted roofing and cladding	2024
Colorcote AlumiGard 0.9mm	New Zealand	Pacific Coilcoaters	42.6		
Colorcote Magnaflow 0.4mm	New Zealand	Pacific Coilcoaters	11.2		
Colorcote Magnaflow 0.55mm	New Zealand	Pacific Coilcoaters	14.6		
Colorcote Zinacore 0.4mm	New Zealand	Pacific Coilcoaters	13.9		
Colorcote Zinacore 0.55mm	New Zealand	Pacific Coilcoaters	18.1		
Colorbond AM100 0.42mm	Australia	Bluescope Steel	11.7	Bluescope Steel EPD S-P-00999 for Colorbond Steel	2022
Colorbond AM100 0.48mm	Australia	Bluescope Steel	13.00		
Other Australian rollformed product (0.41 - 0.45mm)	Australia	Generic	13.46	Colorbond emission factors used with 15% uncertainty added	N/A
Other Australian rollformed product (0.46 - 0.50mm)	Australia	Generic	14.95		

Table 7-2: Installation emission factors for roll-formed steel roofing and cladding



Process	Installation Emission Factor (kg CO <sub>2</sub> e/m <sup>2</sup> )	Source
<b>Commercial installation using crane truck</b>	0.410	Estimate based on industry consultation. See product-specific guidelines for details.

## Heavy Structural Steel

**Table 7-3: Production (A1-A3) emission factors for heavy steel products**

Product	Region	Manufacturer	Production Emission Factor (kg CO <sub>2</sub> e/kg)	Source	EPD Valid Until
<b>Welded Beams and Columns</b>	Australia	Bluescope Steel	2.85	Bluescope Steel EPD S-P-00559 for welded beams and columns	2020 (currently being updated)
<b>Hot rolled structural section</b>	Australia	Infrabuild	3.72	Infrabuild EPD S-P-00856 V1.1 for hot rolled structural and merchant bar	2025
<b>Hot rolled merchant bar product</b>	Australia	Infrabuild	1.24		
<b>Hot Rolled Structural Section</b>	Australia	Liberty	3.32	Liberty EPD S-P-01547 for hot rolled structural and rail	17/07/1905
<b>Other Asian structural steel section</b>	Asia	Generic	1.96	WorldSteel LCA results for average production in Asia, plus 15% uncertainty. Fabrication and installation values based on industry estimates.	N/A
<b>Other Australian Welded section</b>	Australia	Generic	3.28		
<b>Other Australian Hot Rolled Section</b>	Australia	Generic	4.05		
<b>Other NZ structural steel section</b>	New Zealand	Generic	4.57		

**Table 7-4: Fabrication emission factors for heavy steel products**

Process	Installation Emission Factor (kg CO <sub>2</sub> e/m <sup>2</sup> )	Source
<b>Fabrication - Light (14-37 kg/m)</b>	0.011	Estimates of electricity and fuel use from Grayson Engineering. See product-specific guidelines for details.
<b>Fabrication - Medium (37-67 kg/m)</b>	0.008	
<b>Fabrication - Heavy (&gt;67 kg/m)</b>	0.005	

**Table 7-5: Installation emission factors for heavy steel products**

Process	Installation Emission Factor (kg CO <sub>2</sub> e/m <sup>2</sup> )	Source
Installation of heavy steel members with crane truck	0.032	Estimates of crane use from Grayson Engineering. See product-specific guidelines for details.

## Light Steel Framing

**Table 7-6: Production (A1-A3) emission factors for light steel framing (proxy information used)**

Product	Region	Manufacturer	Production Emission Factor (kg CO <sub>2</sub> e/kg)	Source	EPD Valid Until
NZ Light steel framing product (galvanised)	New Zealand	Generic (Proxy data)	4.84	Combination of three EPDs: Pacific Steel EPD S-P-01002 for reinforcing bar (proxy for steel production in NZ), COLORSTEEL EPD addendum for roll-forming only, and Galvanizers Assoc. of Australia EPD S-P-01166 for galvanising, plus 15% uncertainty.	N/A

No material fabrication or installation emissions are expected for light steel framing.

## Reinforcing Steel

Table 7-7: Production (A1-A3) emission factors for reinforcing steel products

Product	Region	Manufacturer	Production Emission Factor (kg CO <sub>2</sub> e/kg)	Source	EPD Valid Until
<b>SEISMIC® Reinforcing bar</b>	New Zealand	Pacific Steel	3.97	Pacific Steel EPD S-P-01002 for reinforcing bar, coil, rod and wire	2023
<b>SEISMIC® Reinforcing - coil</b>	New Zealand	Pacific Steel	3.75		
<b>SEISMIC® Reinforcing - rod</b>	New Zealand	Pacific Steel	3.78		
<b>SEISMIC® Reinforcing - wire (galvanised)</b>	New Zealand	Pacific Steel	3.9		
<b>Reinforcing - bar (basic product)</b>	Australia	Infrabuild Construction Solutions	1.58	Infrabuild Construction Solutions EPD S-P-00855 v1.1 for reinforcing rod, bar and wire	2025
<b>Reinforcing - rod and wire</b>	Australia	Infrabuild Construction Solutions	1.98		
<b>Reinforcing - bar (pre-fabricated assemblies)</b>	Australia	Infrabuild Steel	1.67	Infrabuild Steel EPD S-P-00857 v1.1 for reinforcing bar and mesh	2025
<b>Reinforcing - mesh</b>	Australia	Infrabuild Steel	2.06		
<b>Reinforcing - bar (basic product)</b>	Australia	Australian Reinforcing Company (ARC)	1.8	ARC EPD S-P-00858 for reinforcing bar and mesh	2021
<b>Reinforcing - mesh</b>	Australia	Australian Reinforcing Company (ARC)	2.6		
<b>Other NZ reinforcing product</b>	New Zealand	Generic	4.43	Average of Pacific Steel products + 15%	N/A
<b>Other Australian reinforcing product</b>	Australia	Generic	2.24	Average of Infrabuild and ARC products + 15%	N/A
<b>Other Asian reinforcing product</b>	Asia	Generic	2.60	Rebar - WorldSteel 2019 Data + 15%	N/A

**Table 7-8: Fabrication emission factors for reinforcing steel products**

Process	Fabrication Emission Factor (kg CO <sub>2</sub> e/kg)	Source
<b>Fabrication</b>	0.011	Fletcher Reinforcing average data – see product-specific guidelines for details

## Semi-Finished and Intermediate Products

**Table 7-9: Production (A1-A3) emission factors for semi-finished products**

Product	Region	Manufacturer	Production Emission Factor (kg CO2e/kg)	Source	EPD Valid Until
<b>Hot rolled coil</b>	Australia	Bluescope Steel	2.52	BlueScope Steel EPD S-P-00577 for steel - hot rolled coil	2020 (currently being updated)
<b>XLERPLATE® plate steel</b>	Australia	Bluescope Steel	2.75	BlueScope Steel EPD S-P-00558 for XLERPLATE steel	2020 (currently being updated)
<b>Other Australian hot rolled coil</b>	Australia	Generic	2.898	Bluescope EPD + 15% uncertainty	N/A
<b>Other Australian plate steel</b>	Australia	Generic	3.1625	Bluescope EPD + 15% uncertainty	N/A
<b>Other Asian Hot rolled coil</b>	Asia	Generic	2.7945	WorldSteel data + 15% uncertainty	N/A
<b>Other Asian Hot-dip galvanised coil</b>	Asia	Generic	3.542	WorldSteel data + 15% uncertainty	N/A
<b>Other Asian Electrogalvanised coil</b>	Asia	Generic	3.6685	WorldSteel data + 15% uncertainty	N/A
<b>Other Asian Engineering Steel</b>	Asia	Generic	1.587	WorldSteel data + 15% uncertainty	N/A

No fabrication or installation emissions are required for semi-finished products.

## Stainless Steel Finished Products

**Table 7-10: Production (A1-A3) emission factors for stainless steel finished products**

Product	Region	Manufacturer	Production Emission Factor (kg CO <sub>2</sub> e/kg)	Source	EPD Valid Until
<b>Cold Rolled Stainless Steel</b>	Global	Outokumpu Oyj	3.39	Outokumpu EPD-OTO-20190002-IBD1-EN for cold rolled stainless steel	2024
<b>Hot Rolled Stainless Steel</b>	Global	Outokumpu Oyj	2.89	Outokumpu EPD-OTO-20190003-IBD1-EN for hot rolled stainless steel	2024
<b>Stainless steel long product</b>	Global	Outokumpu Oyj	2.74	Outokumpu EPD-OTO-20190107-IBD1-EN for stainless steel long product	2024
<b>Welded and pickled stainless steel product</b>	Global	Outokumpu Oyj	4.72	Outokumpu NEPD-1620-644-EN for welded and pickled stainless steel product	2023
<b>Other International Stainless steel (including fabrication and installation)</b>	Global	Generic	3.795	International Stainless Steel Forum LCA data + 15%	N/A

**Table 7-11: Fabrication emission factors for finished stainless steel products\***

Process	Fabrication Emission Factor (kg CO <sub>2</sub> e/kg)	Source
<b>Fabrication of stainless steel product</b>	0.13	Industry average data used – see product-specific guidelines for details

\* Note: The 'generic' stainless steel production value from WSSI already includes fabrication emissions, so there is no need to add fabrication emissions to this.