

The Electric Arc Furnace

Decarbonising local steelmaking

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New Zealand
Steel



60 YEARS STRONG





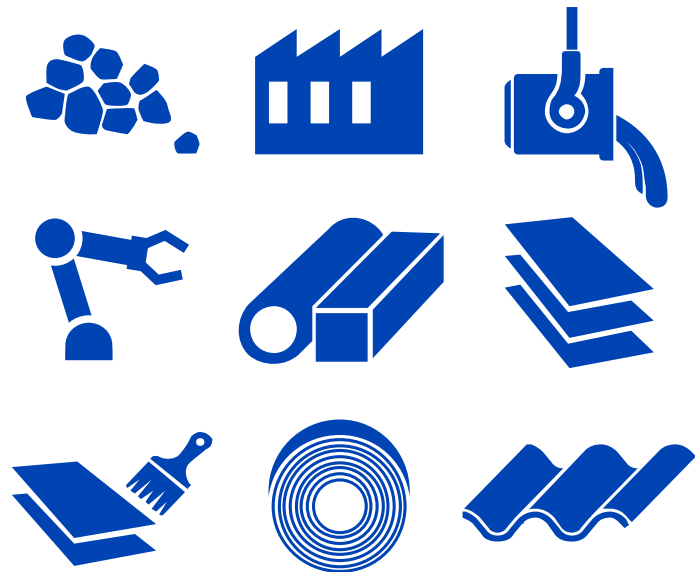
Local Steelmaking



NEW ZEALAND STEEL

Our business at a glance

New Zealand's only domestic fully integrated producer of flat and rolled steel products – crucial to security of supply and avoidance of supply chain disruption for New Zealand's construction, manufacturing, infrastructure and agriculture sectors.



New Zealand made for 60 years



Contributing \$900 million to the economy annually



\$398 million value added in the Auckland region



4,000 people employed

60 YEARS OF SAND TO STEEL



Full integrated local production | 24 x 7 at Glenbrook Mill



60 YEARS OF SAND TO STEEL

Waikato North Head | Ironsand Mine Site



60 YEARS OF SAND TO STEEL

Full integrated local production | **Steelmaking**



60 YEARS OF SAND TO STEEL

Full integrated local production | Slab Casting



60 YEARS OF SAND TO STEEL



Full integrated local production | Hot Rolling Mill



60 YEARS OF SAND TO STEEL

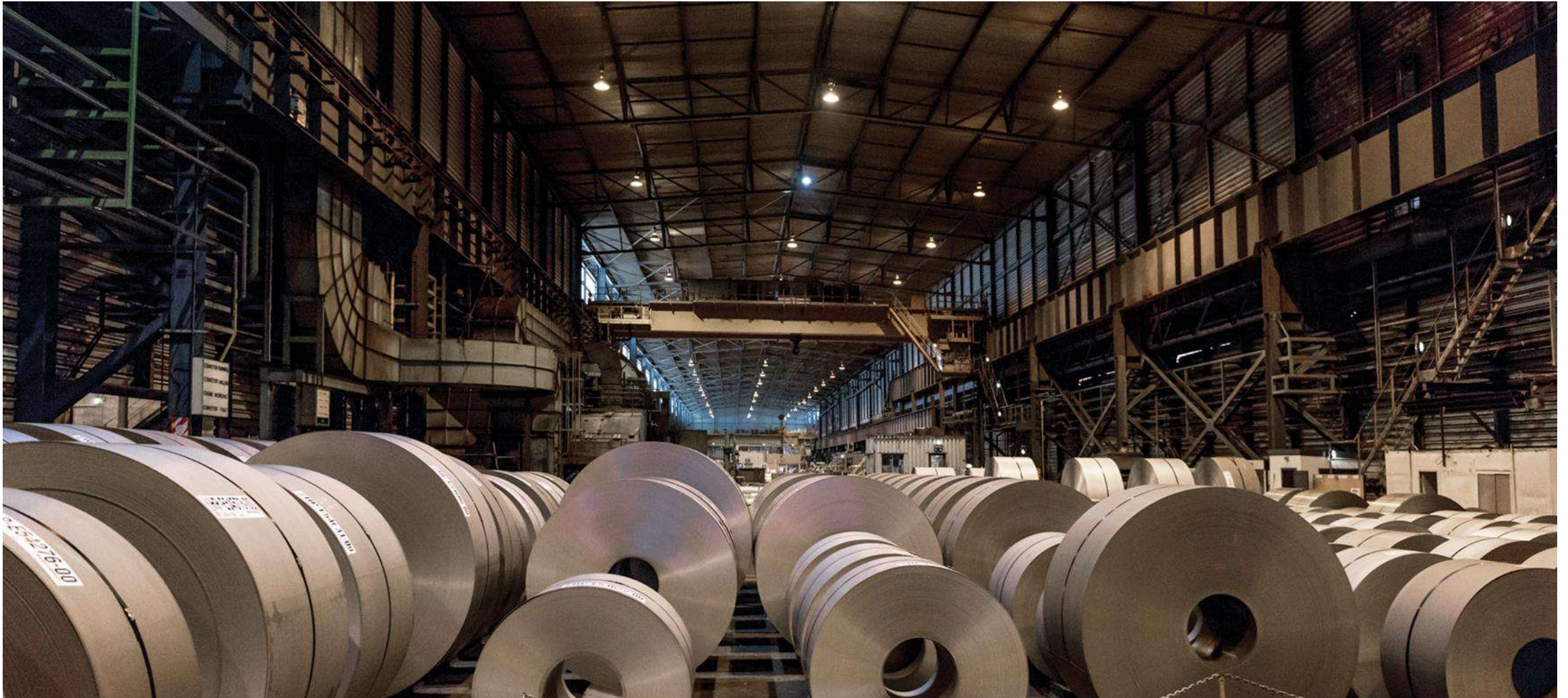


Full integrated local production | Hot Rolling Mill



60 YEARS OF SAND TO STEEL

Full integrated local production | Cold Rolling Mill



60 YEARS OF SAND TO STEEL



1.5t Billets from Steelmaking to Pacific Steel via rail



60 YEARS OF SAND TO STEEL

Reinforcing bar, coil & mesh feed from Pacific Steel



Reinforcing Steel in Bar & Coil



Steel for Ductile Mesh

Decarbonisation of Steel

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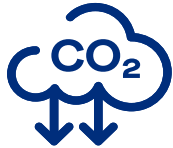
WHY FOCUS ON CARBON EMISSIONS?

The Driving Forces Behind Decarbonisation



Greenhouse gases contribute to climate change Impacts

- Including flooding, droughts, fires and other severe weather events.



New Zealand has committed GHG emissions reduction targets

- **Climate Change Response Act (CCRA)** - net zero by 2050*
- **The Paris Agreement** - A legally binding international treaty with 2030 & 2050 targets.
- **NZ Climate Change Commission** - advises on emissions reduction plans & budgets.



Building & Construction

- **37%** of global emissions³ & **20%** of NZ's emissions⁴ are from buildings & construction.
- Steel & concrete are significant contributors to NZ's B&C carbon footprint.
- Sustainability linked loans are providing financial incentives such as lower interest rates for commercial building projects meeting sustainability criteria.

*excluding biogenic methane

<https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/low-emissions-economy/emissions-reduction-plan/>

<https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-19902021-snapshot/>

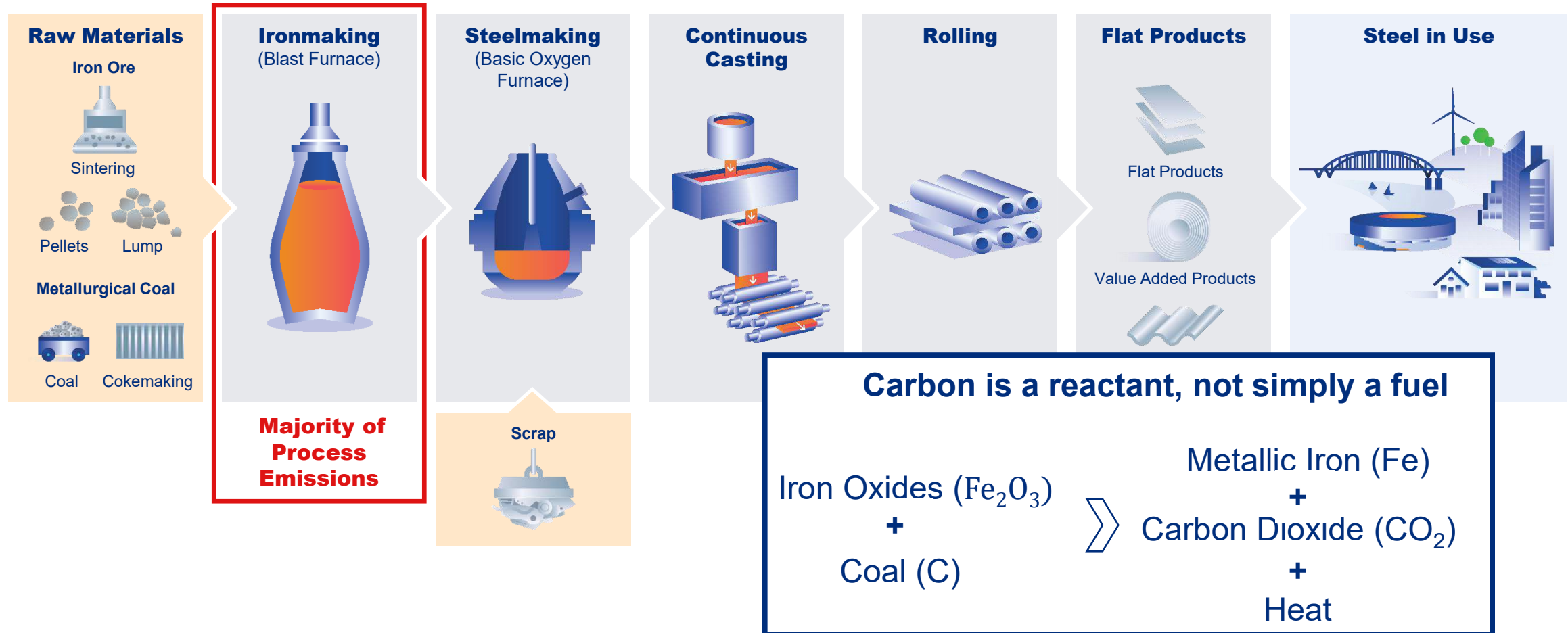
<https://wedocs.unep.org/handle/20.500.11822/43293>

<https://www.branz.co.nz/sustainable-building/climate-change/>

<https://www.thinkstep-anz.com/resrc/reports/hidden-emissions-and-untapped-potential-of-buildings-for-new-zealands-2050-zero-carbon-goal/>

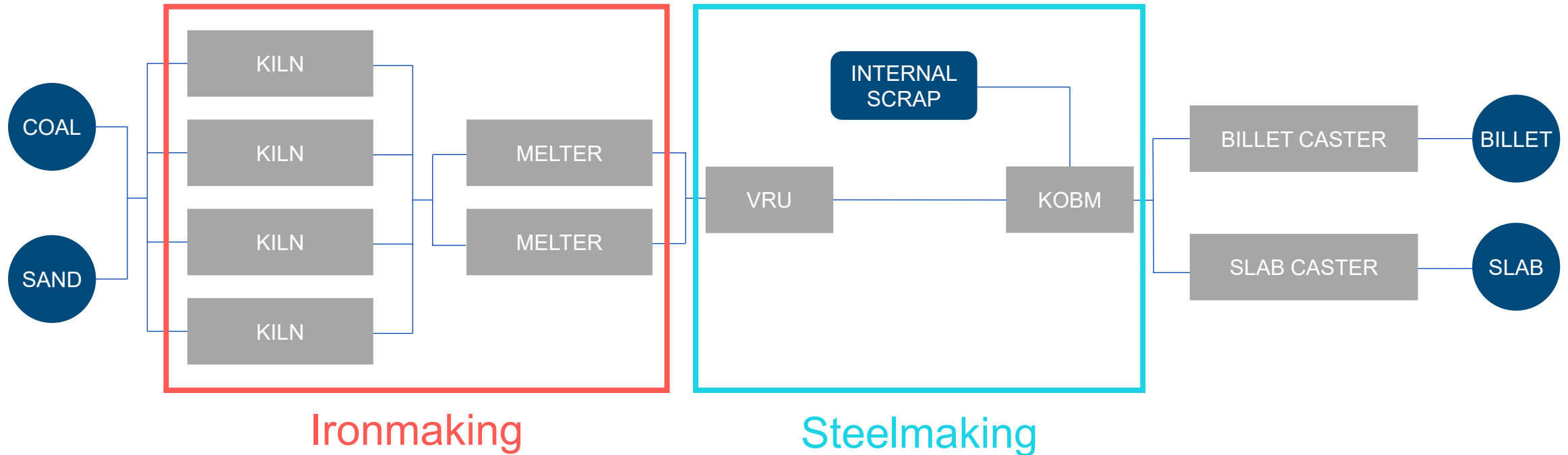
THE INTEGRATED STEELMAKING PROCESS

Virgin steel typically involves ironmaking via blast furnace & steelmaking via basic oxygen furnace (BOF)



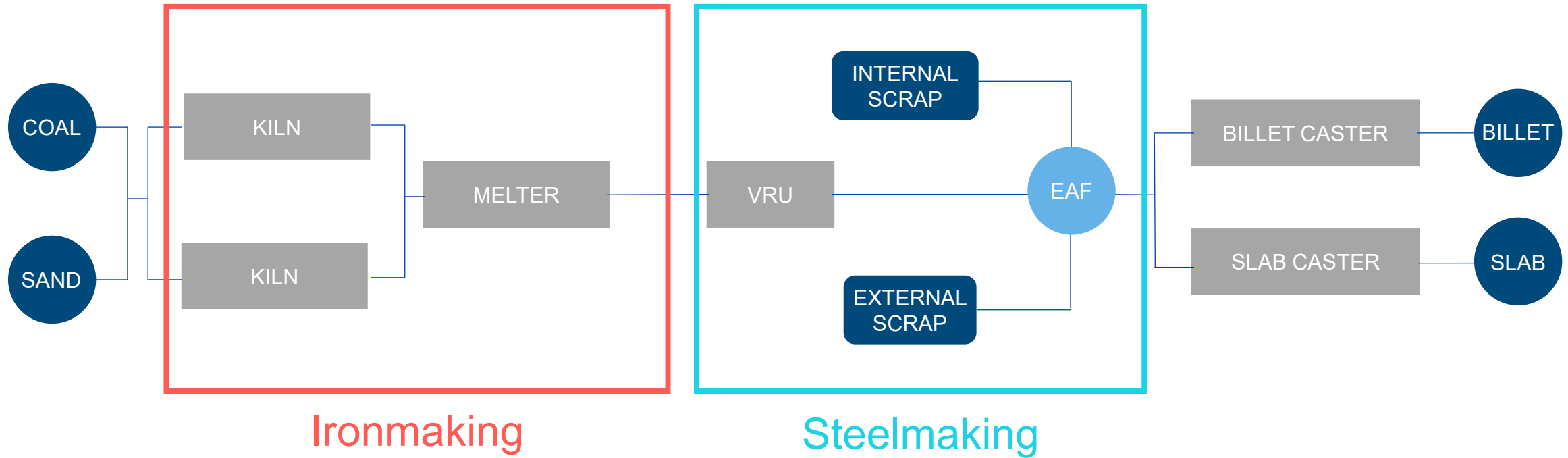
THE INTEGRATED STEELMAKING PROCESS

The Original Process at New Zealand Steel



A NEW LOCAL PROCESS IS BORN

The Electric Arc Furnace Process at New Zealand Steel



EAF Project Update

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Electrodes

EAF Video Link:

https://www.youtube.com/watch?v=g6Ra_Cb1A8Q

Electric Arc Furnace (EAF)

PROGRESS SHOTS OF THE EAF

Stack and Baghouse Construction



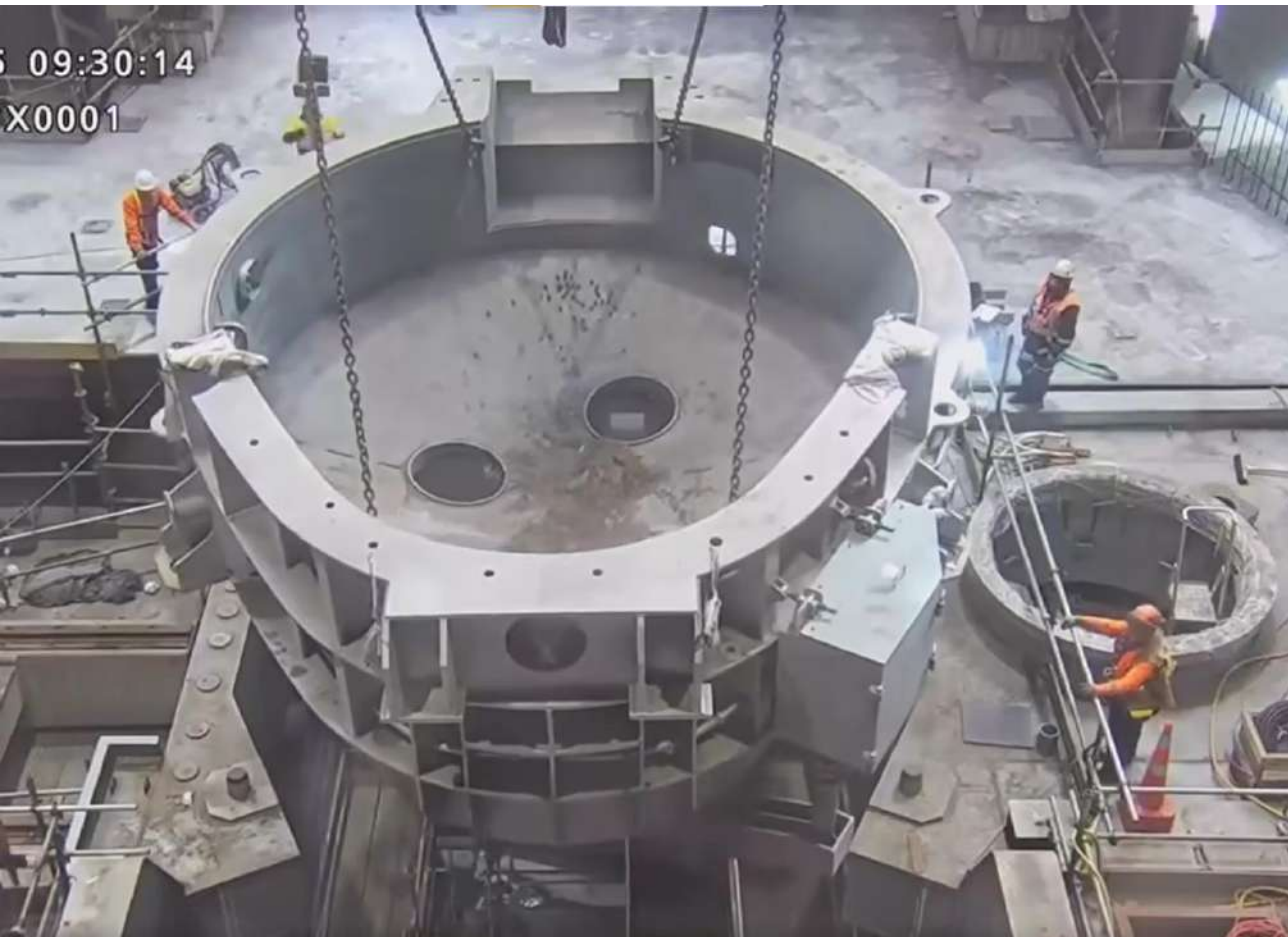
PROGRESS SHOTS OF THE EAF

EAF Tilt Frame Installed



PROGRESS SHOTS OF THE EAF

The furnace in situ with electrode hoist assembly progress



PROGRESS SHOTS OF THE EAF

Aligning the upper EAF shell onto the bottom shell



PROGRESS SHOTS OF THE EAF

ECS Preheat Platform Poured & ECS Preheat Structure



PROGRESS SHOTS OF THE EAF

EAf and ECS installation



PROGRESS SHOTS OF THE EAF

EAf and ECS installation

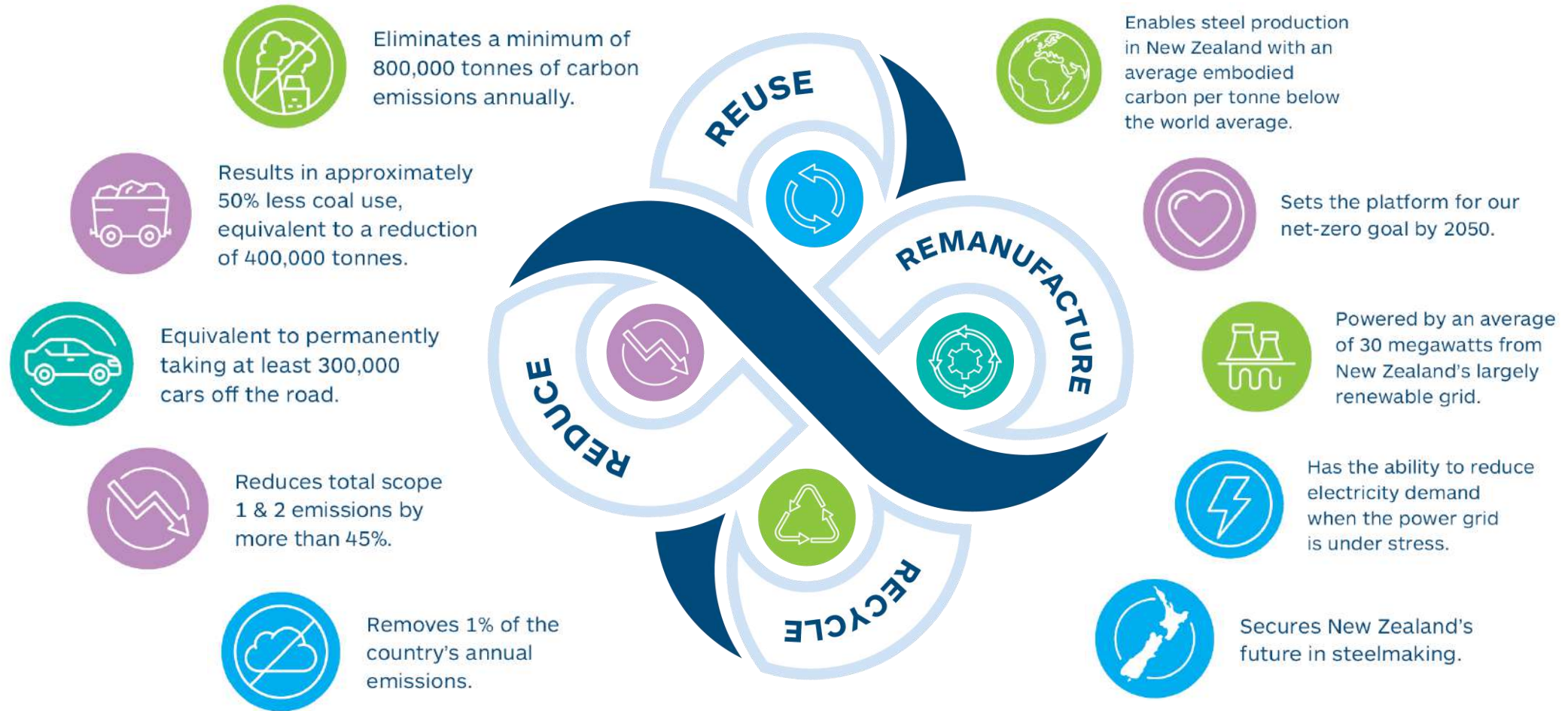


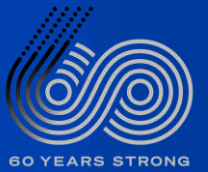
PROGRESS SHOTS OF THE EAF

ECS to external view & CEO visit



A NEW PROCESS IS BORN





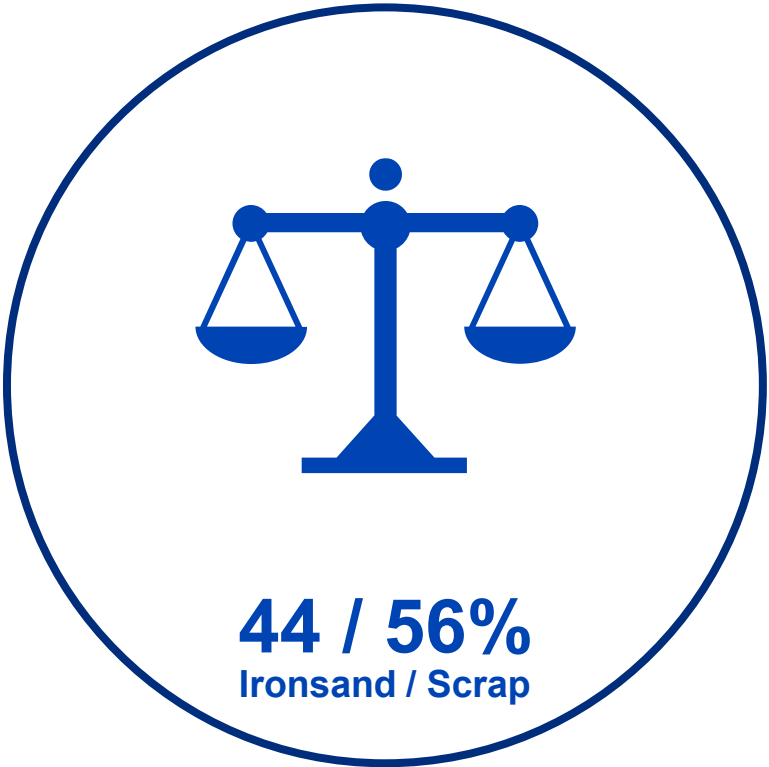
**Local steel
products
transformed**

4

A NEW PROCESS IS BORN



Today



2026 & Beyond





**New Zealand
Steel**

| **DCRB**TM

OUR TWO EAF STEEL BLENDS

PACIFIC STEEL® REBAR



GWP = Global Warming Potential

A close-up photograph of a welder in a dark, protective suit and a large, textured welding helmet. The welder is focused on a task, with a bright, intense light emanating from the point where they are working on a metal structure. A shower of bright, golden-orange sparks is being produced, radiating outwards and filling the lower half of the frame. The background is dark and out of focus, with some vertical lines and bokeh light spots, suggesting an industrial setting. The overall atmosphere is one of intense, focused labor.

PACIFIC DCRB™

ENVIRONMENTAL PRODUCT DECLARATIONS



Post-EAF - Reinforcing

44 / 56%
Ironsand / Scrap

100%
Scrap



New Standard Blend | 1.89 GWP



New Standard Blend | 1.85 GWP



100% Scrap | 0.485 GWP



100% Scrap | 0.474 GWP

OUR TWO EAF STEEL BLENDS



PLATE STEEL & PLATE STEEL DCRB™



46% Reduction

83% Reduction

GWP = A1-A3 kgCO₂-eq/kg Global Warming Potential

*NZGBC Embodied Carbon Methodology:

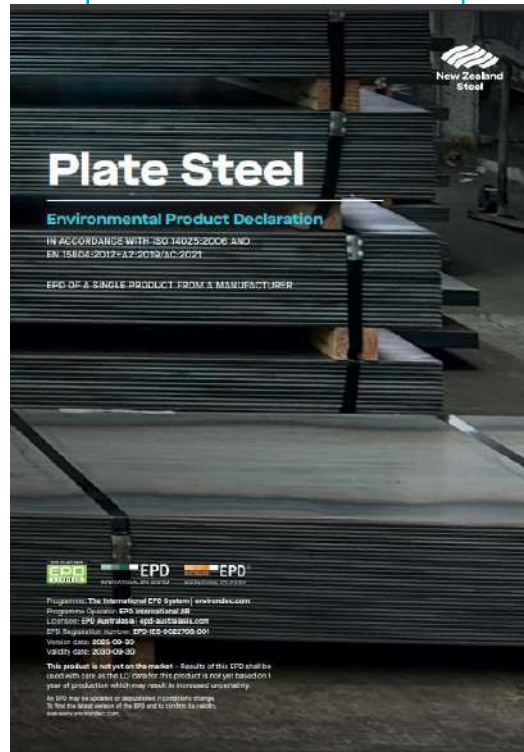
<https://nzgbc.org.nz/hubfs/Green%20Star%20technical%20resources/Green%20Star%20Buildings/NZGBC%20Embodied%20Carbon%20Methodology%20-%20v2.0.pdf>

ENVIRONMENTAL PRODUCT DECLARATIONS



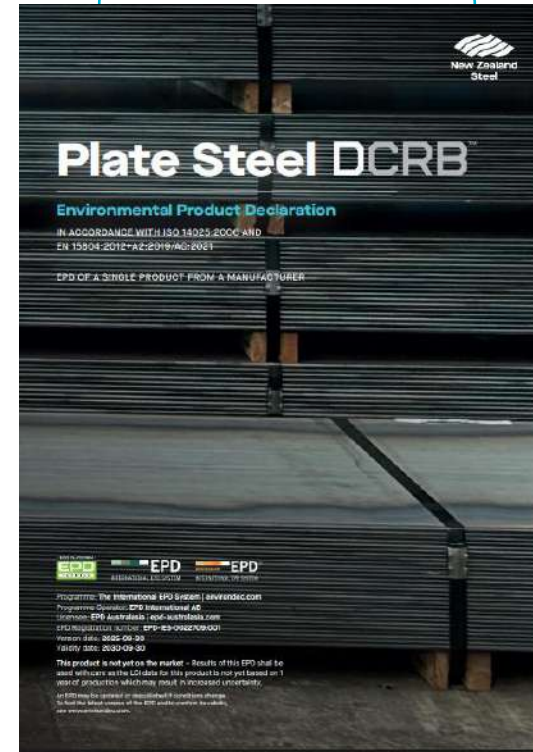
Post-EAF - Plate

44 / 56%
Ironsand / Scrap



New Standard Blend | 2.06 GWP

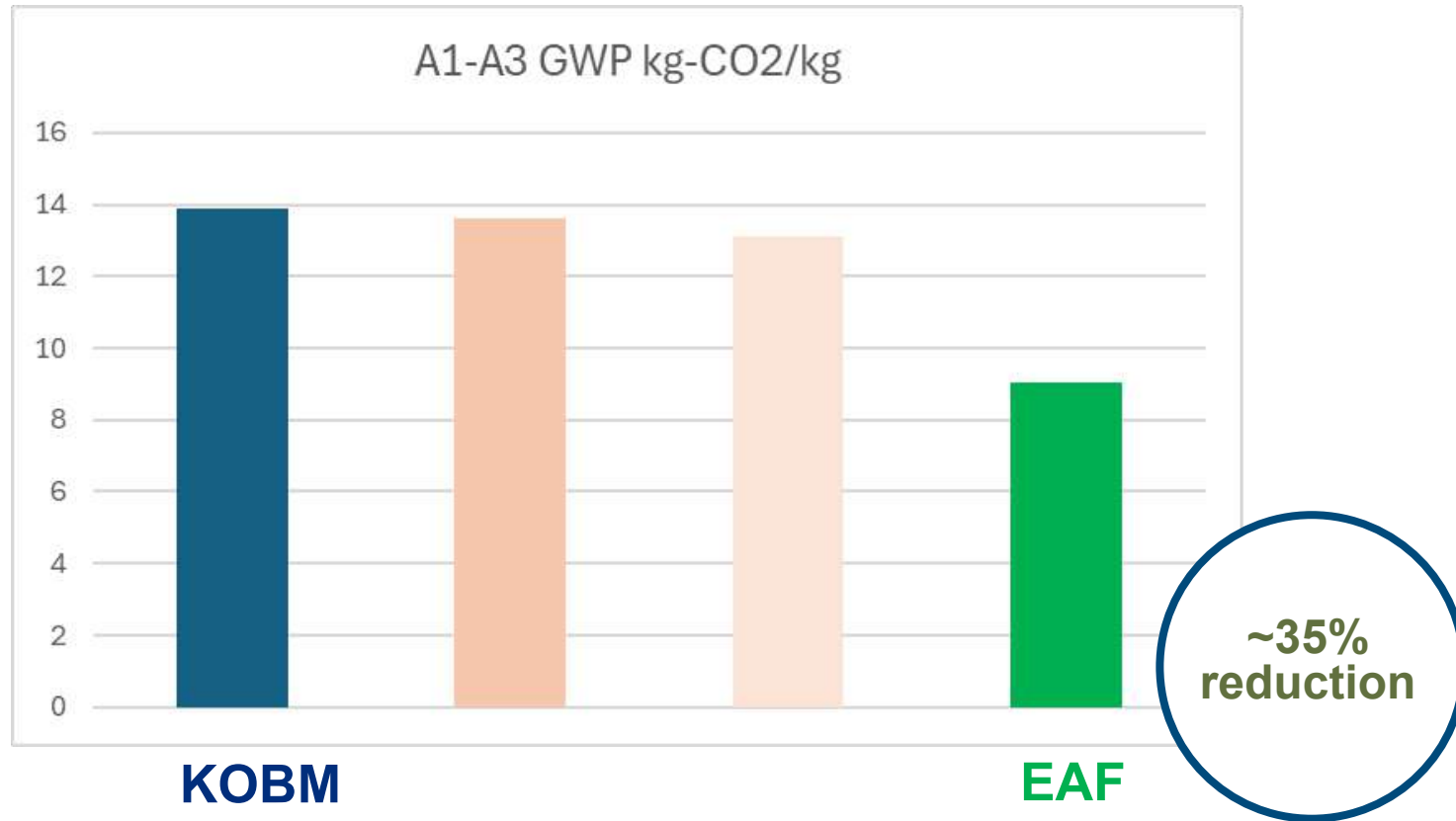
100%
Scrap

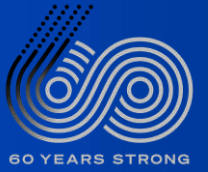


100% Scrap | 0.641 GWP

NEW COLORSTEEL EPD

FUTURE – EAF





Delivering the Impact

5

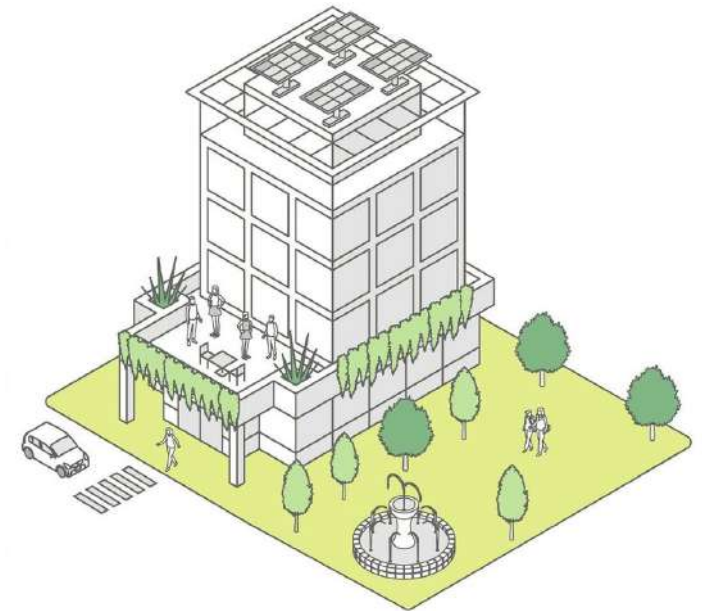
GREEN STAR BUILDINGS



And our products

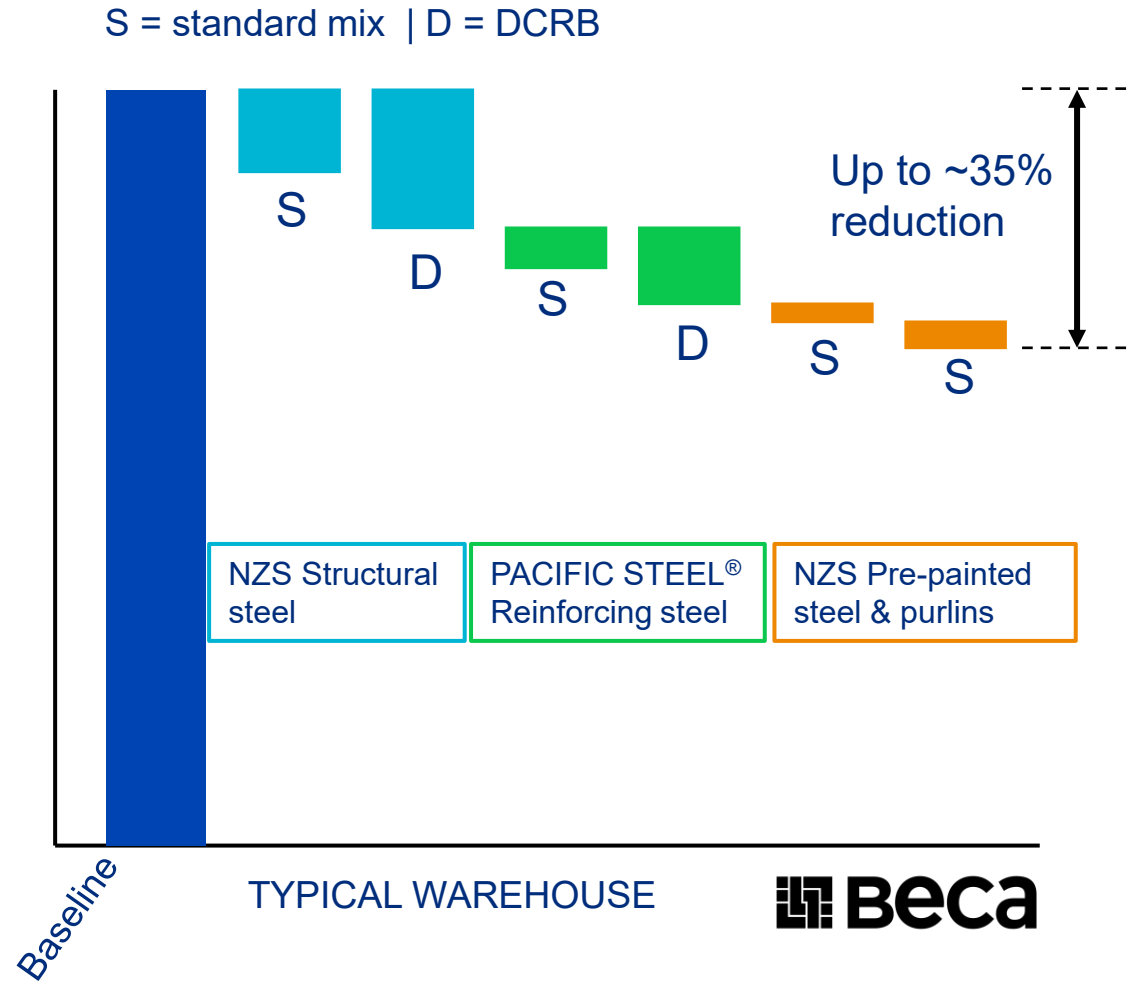
Credit 21 – Upfront Carbon Emissions (8 Points available)

- Part of minimum requirements for 4-, 5- and 6-star buildings.
- Up to 8 points available for 53% reduction vs a reference building.



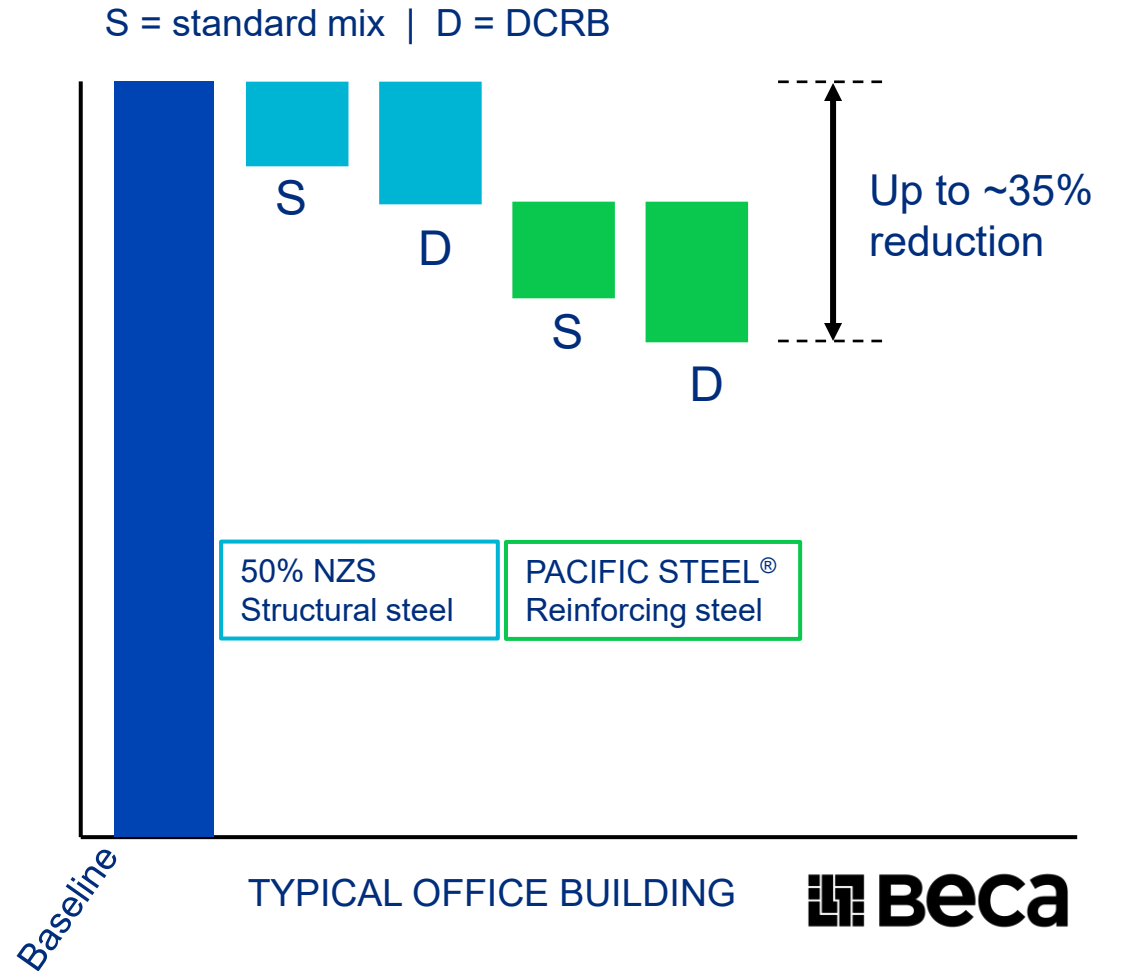
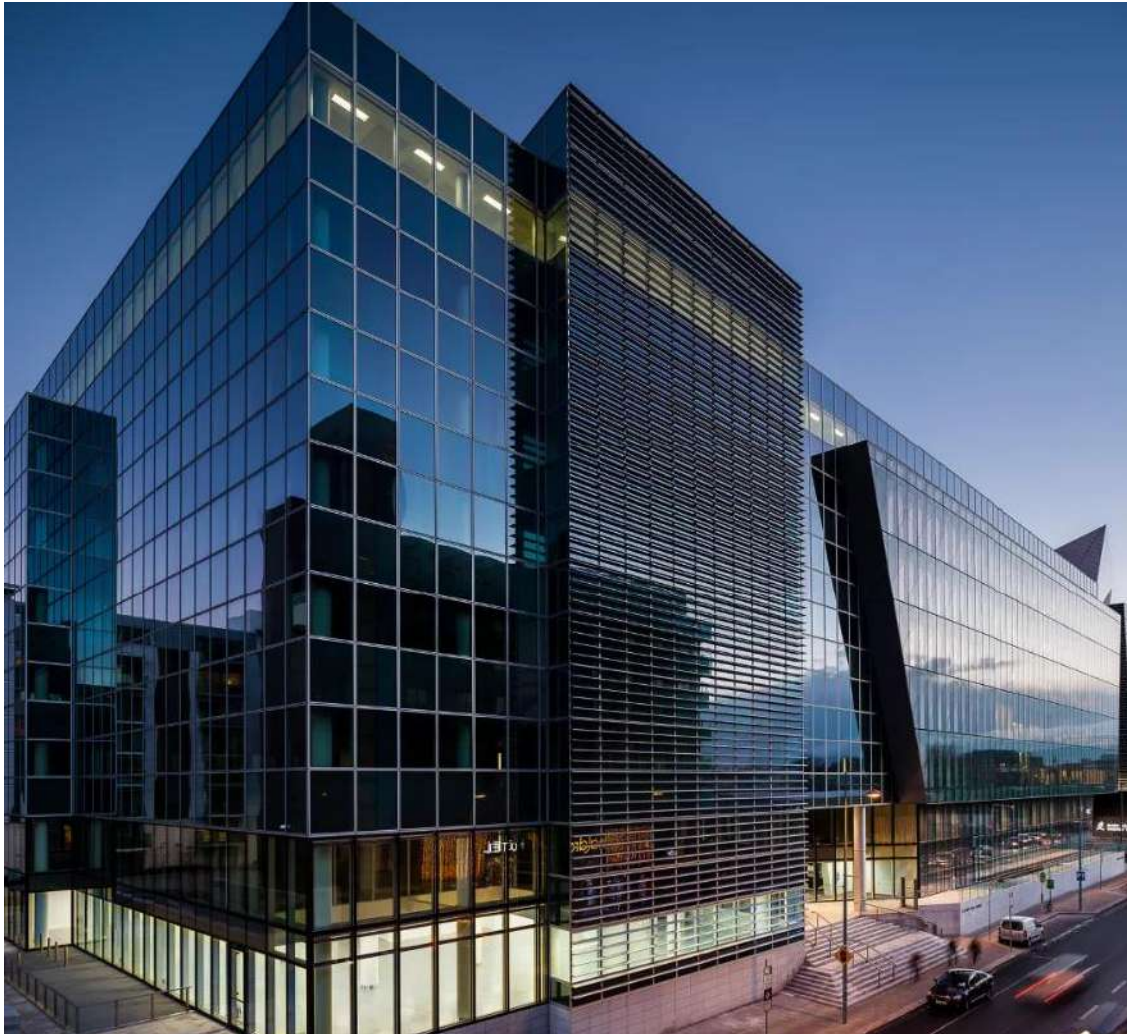
MODELLING THE DIFFERENCE

Typical Warehouse Example



MODELLING THE DIFFERENCE

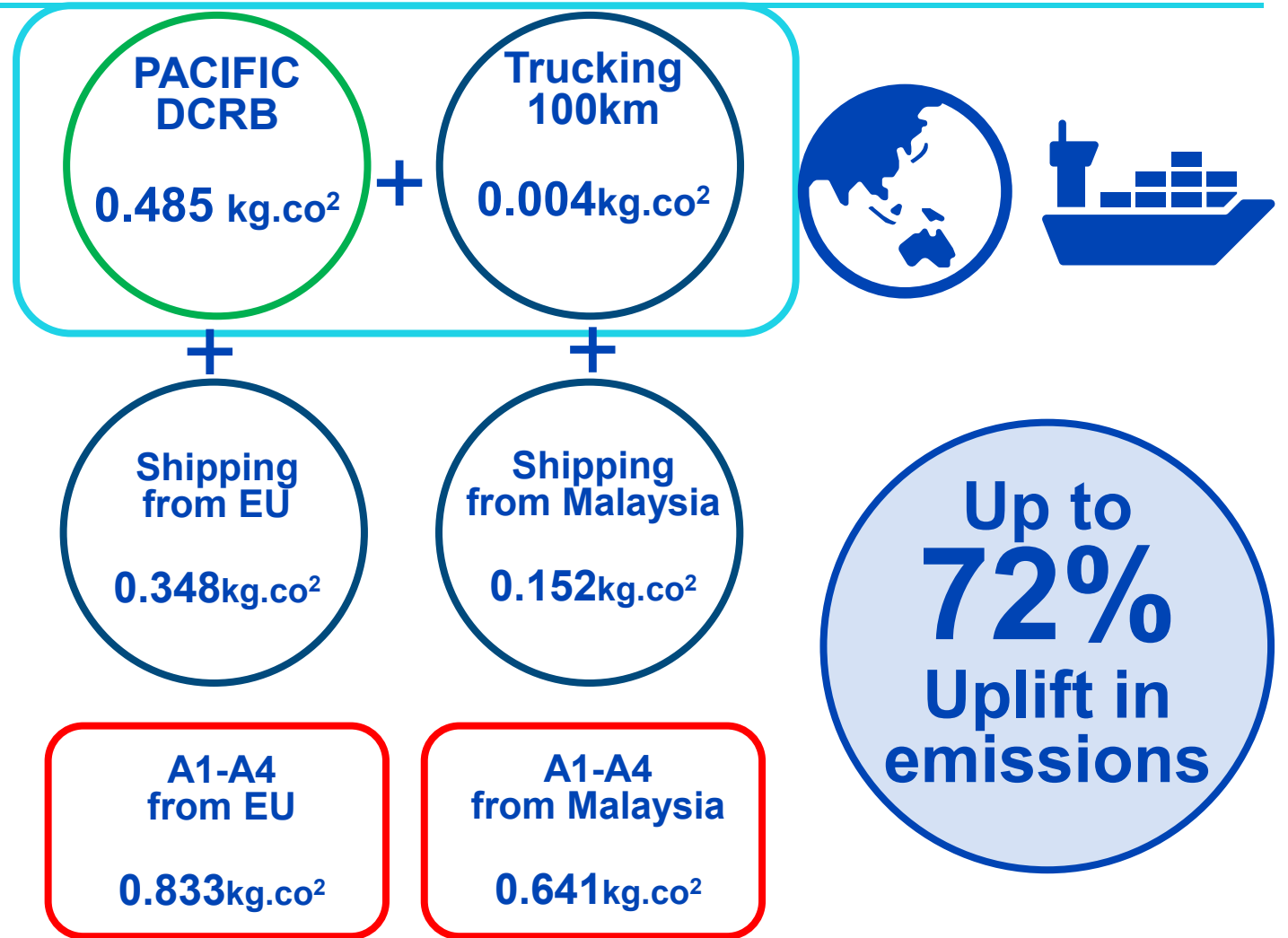
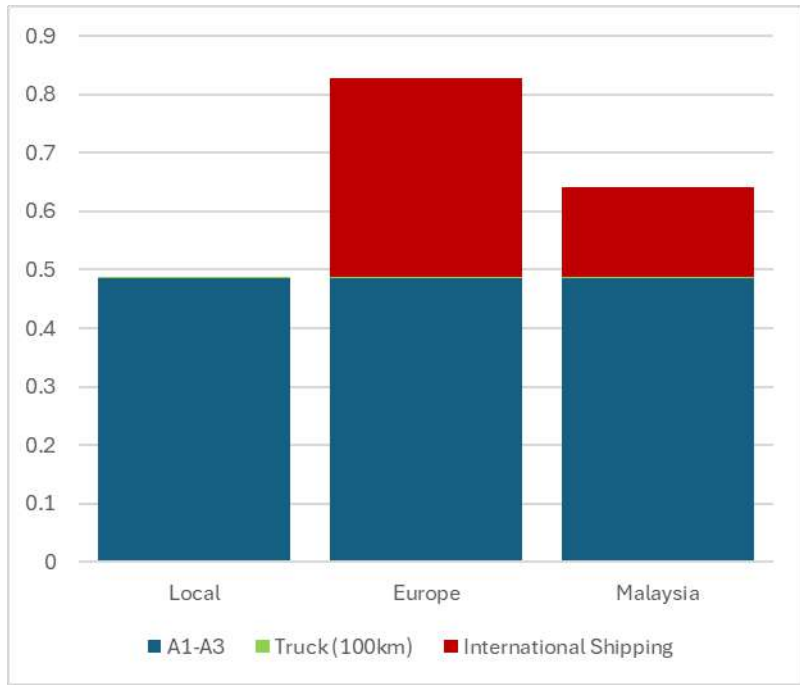
Typical Office Building Example



TRANSPORT & LOCAL SUPPLY CHAIN

Transport Emissions (A4) are now Meaningful

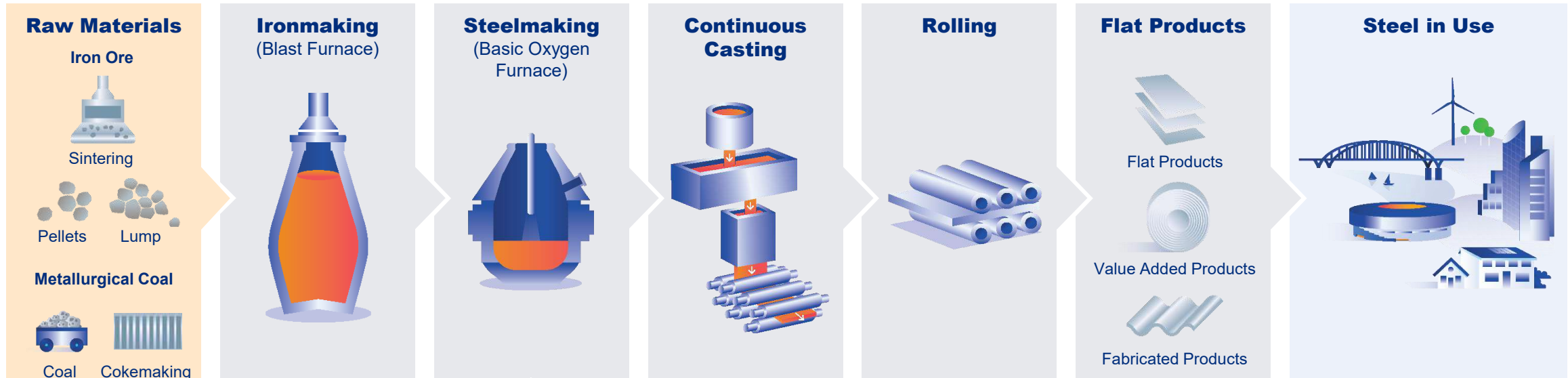
A1-A3 – Cradle to Gate Emissions (kgCO₂/kg steel)



REAL LOCAL STEEL PROCUREMENT

What does locally sourced materials mean

New Zealand made – NZ Steel & Pacific Steel



Overseas manufacturing, employment & resource use

New Zealand Processed ?



GREEN STAR BUILDINGS



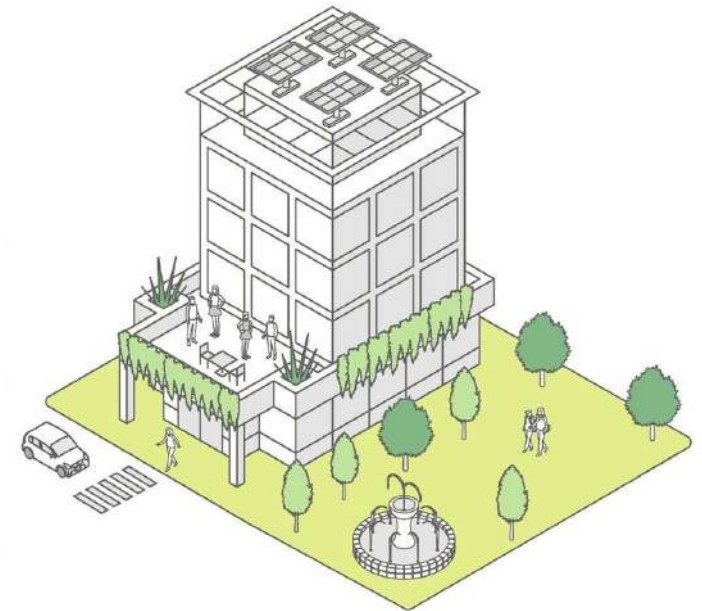
And our products

Credit 6 – Responsible Structure (5 Points available)

Credit 7 – Responsible Envelope (4 Points available)

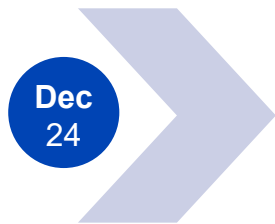
- Responsible Product Value (RPV) assessed by GBCA tool looking at wide array of criteria.
- Minimum RPV is 10. 'Exceptional Performance' achieved by RPV of 15
- Our RPV's are achieved via combination of Eco Choice Certificates & EPD's

- **PACIFIC™ reinforcing products achieve an RPV of 23**
- **Plate Steel achieves an RPV of 16**, (will be 25 with the new post-EAF EPD)
- **COLORSTEEL® achieves an RPV of 18**
- **ZINCALUME® & AXXIS® achieves an RPV of 11** (will be 18 with the new post-EAF EPD)
- **GALVSTEEL® achieves an RPV of 11**



EAF PROJECT

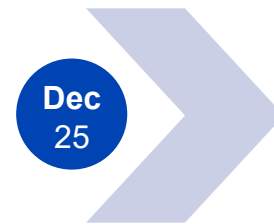
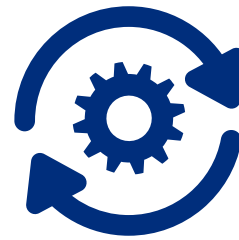
Timeline



Scrap & iron blend confirmed



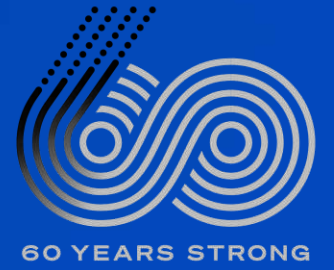
New EPD's to be produced



Cold Commissioning of EAF to begin



EAF Commissioned and producing steel



Thank You

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