Greenhouse Gas Emissions Intensity Performance Thresholds for Crude Steel

March 2021

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Greenhouse Gas (GHG) Emissions Intensity Performance Thresholds for Crude Steel

Welcome and Introductions

Anne-Claire Howard, CEO, ResponsibleSteel

GHG Emissions Intensity Performance Thresholds, Standards and Procurement

Matthew Wenban-Smith, Policy and Standards Director, ResponsibleSteel

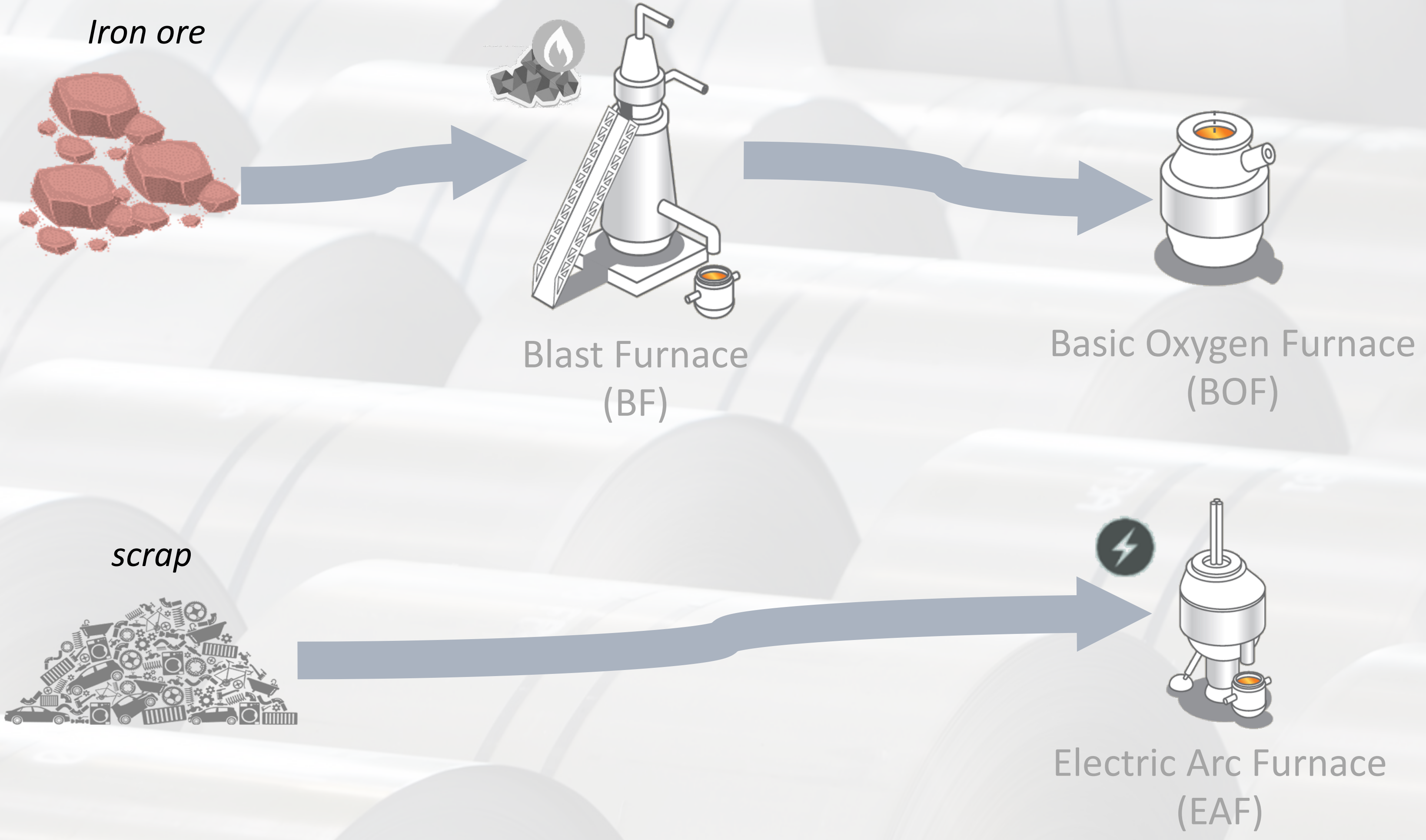
CRU Steel Carbon Module

Paul Butterworth, Head of Steel Analysis, CRU

1. Steelmaking, GHG emissions and scrap
2. Why specifying low embodied carbon steel is not enough
3. A better way to measure performance and support lower emissions

Net Zero Steel Pathway Methodology Project

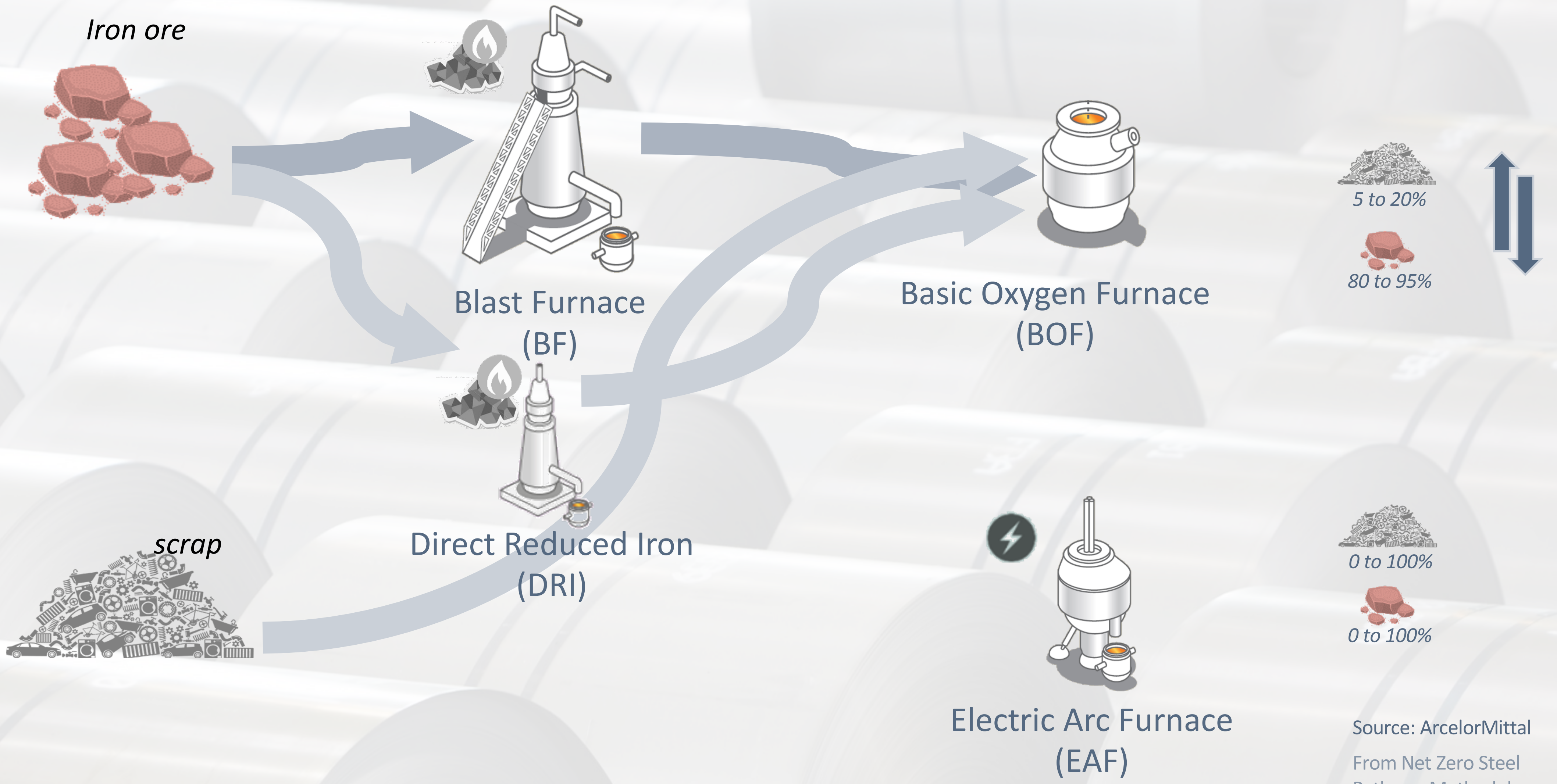
Steelmaking, GHG emissions and scrap



Source: ArcelorMittal

From Net Zero Steel Pathway Methodology Project

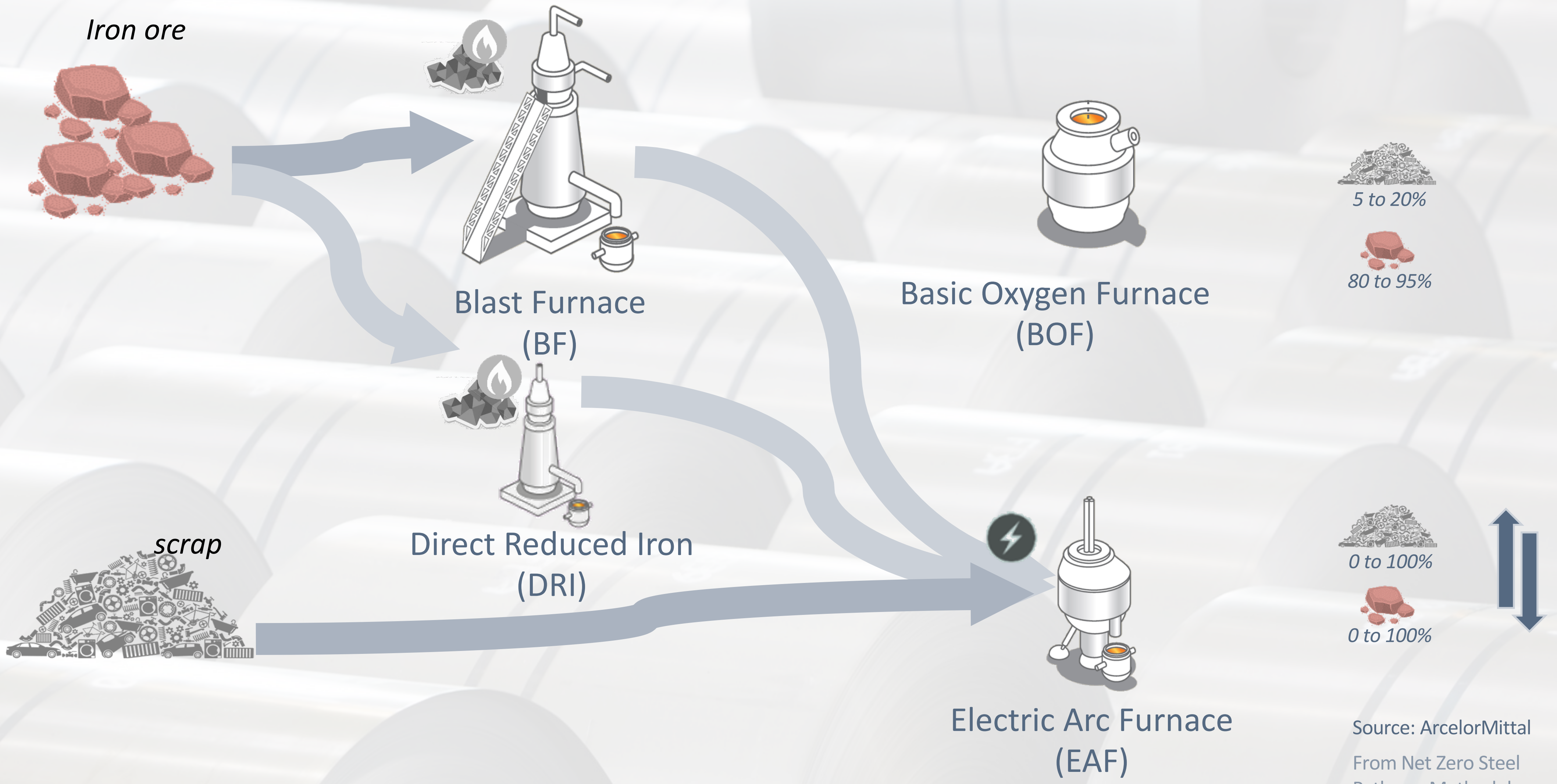
Iron ore and scrap for steelmaking: the BF/BOF route



Source: ArcelorMittal

From Net Zero Steel Pathway Methodology Project

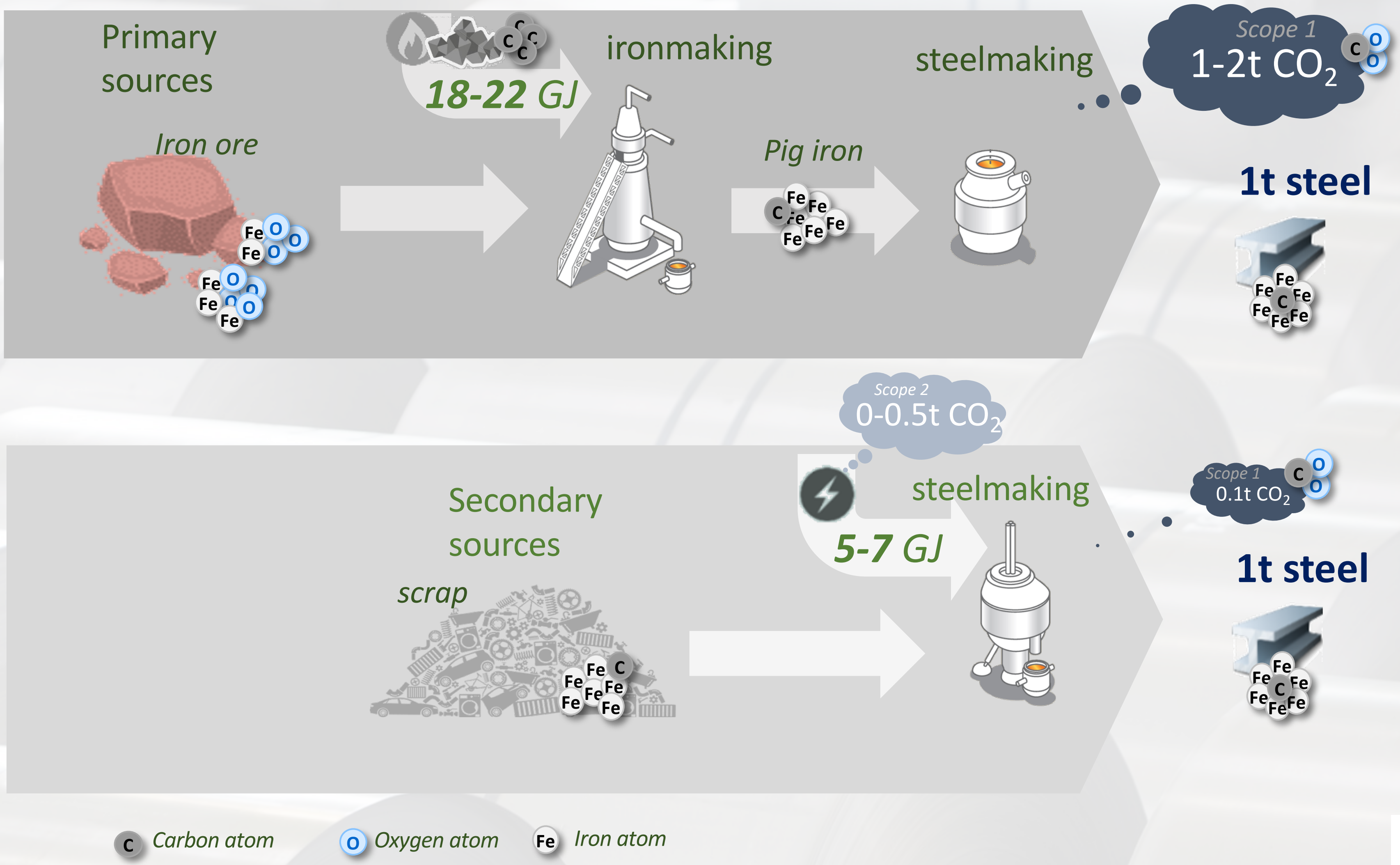
Iron ore and scrap for steelmaking: the EAF route



Source: ArcelorMittal

From Net Zero Steel Pathway Methodology Project

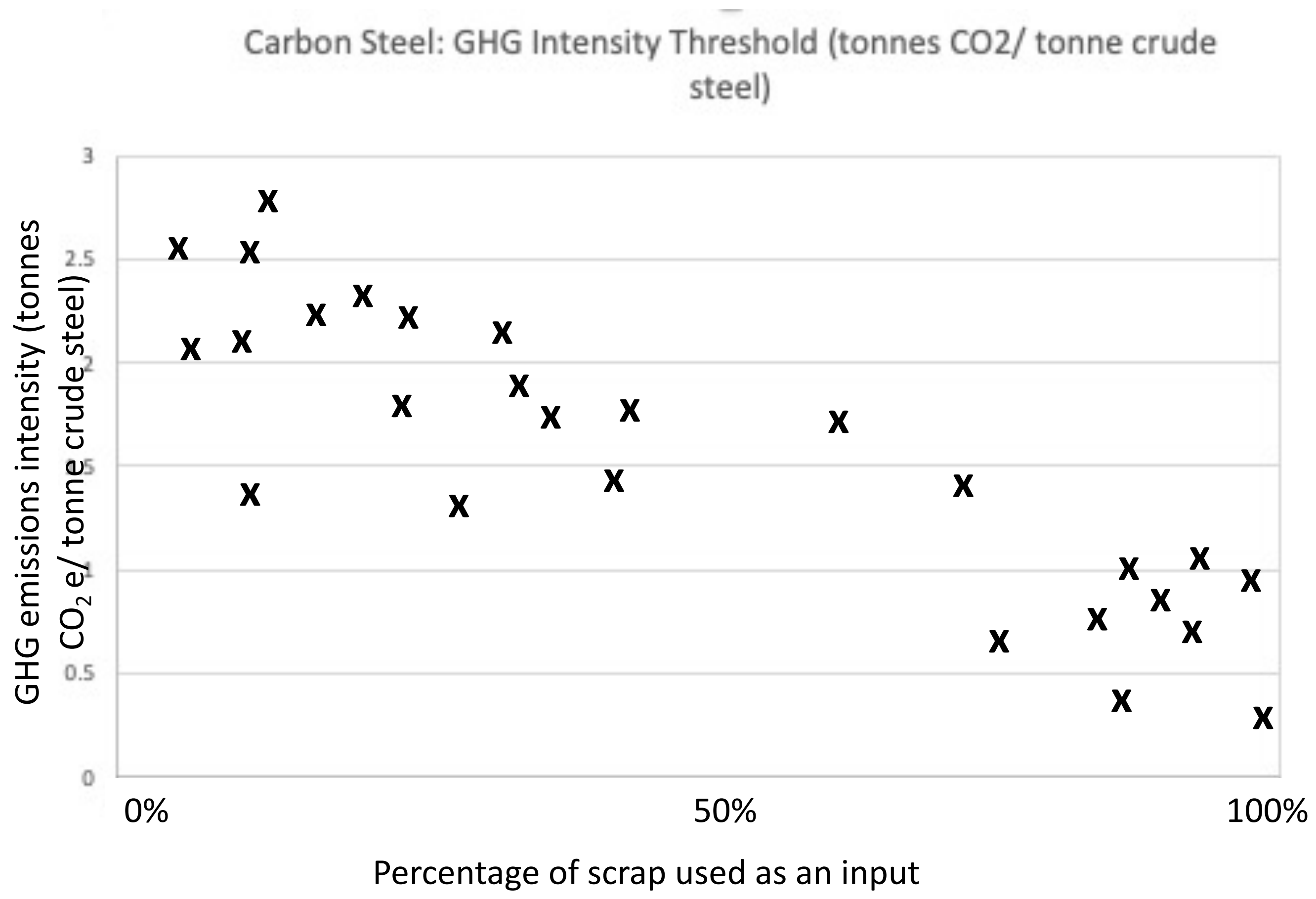
Steelmaking direct from iron ore has higher CO_2 emissions



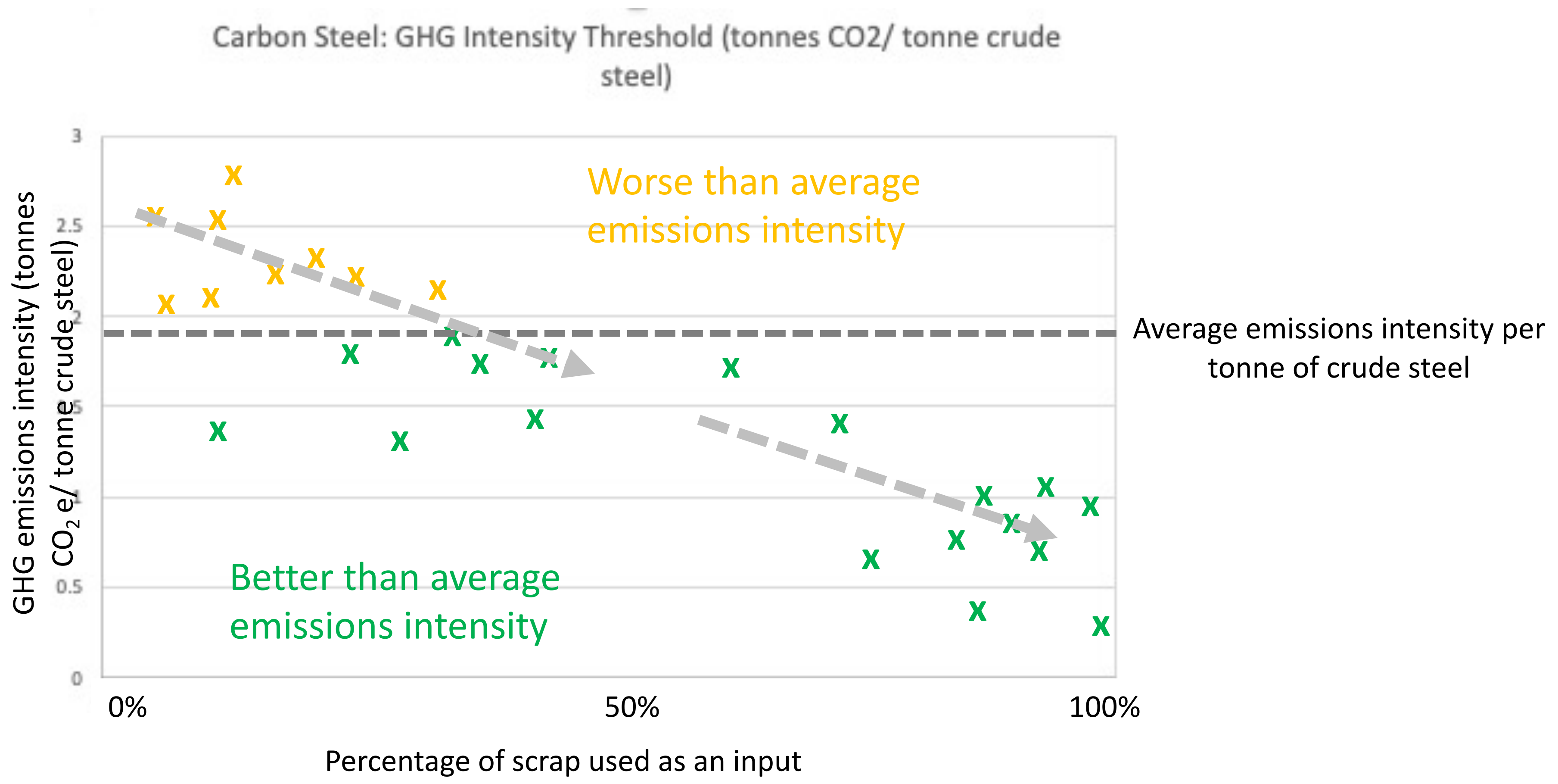
Source: ArcelorMittal

From Net Zero Steel Pathway Methodology Project

Increasing scrap use lowers emissions intensity for any steelmaking route

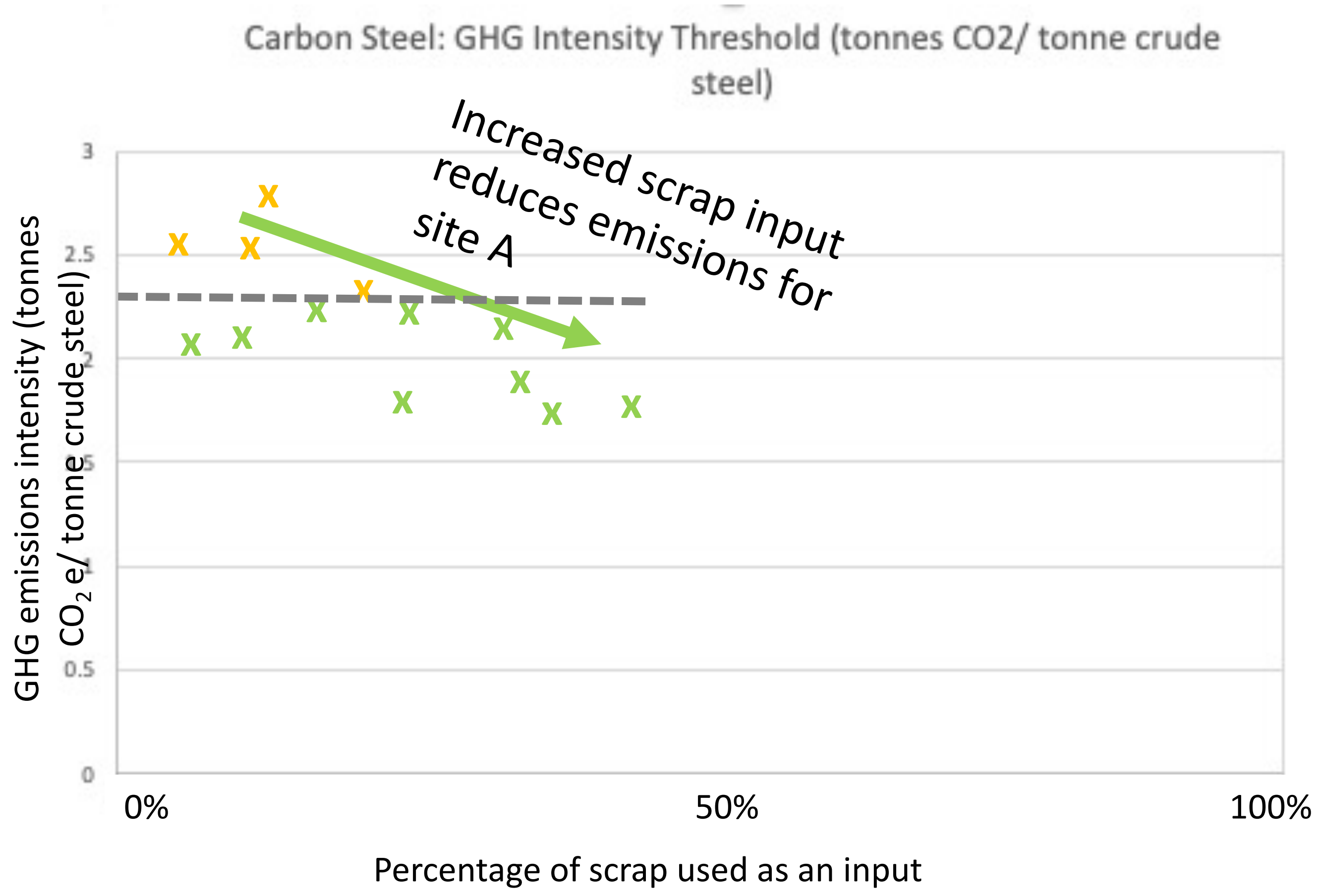


Simple measures of carbon intensity incentivise the use of scrap

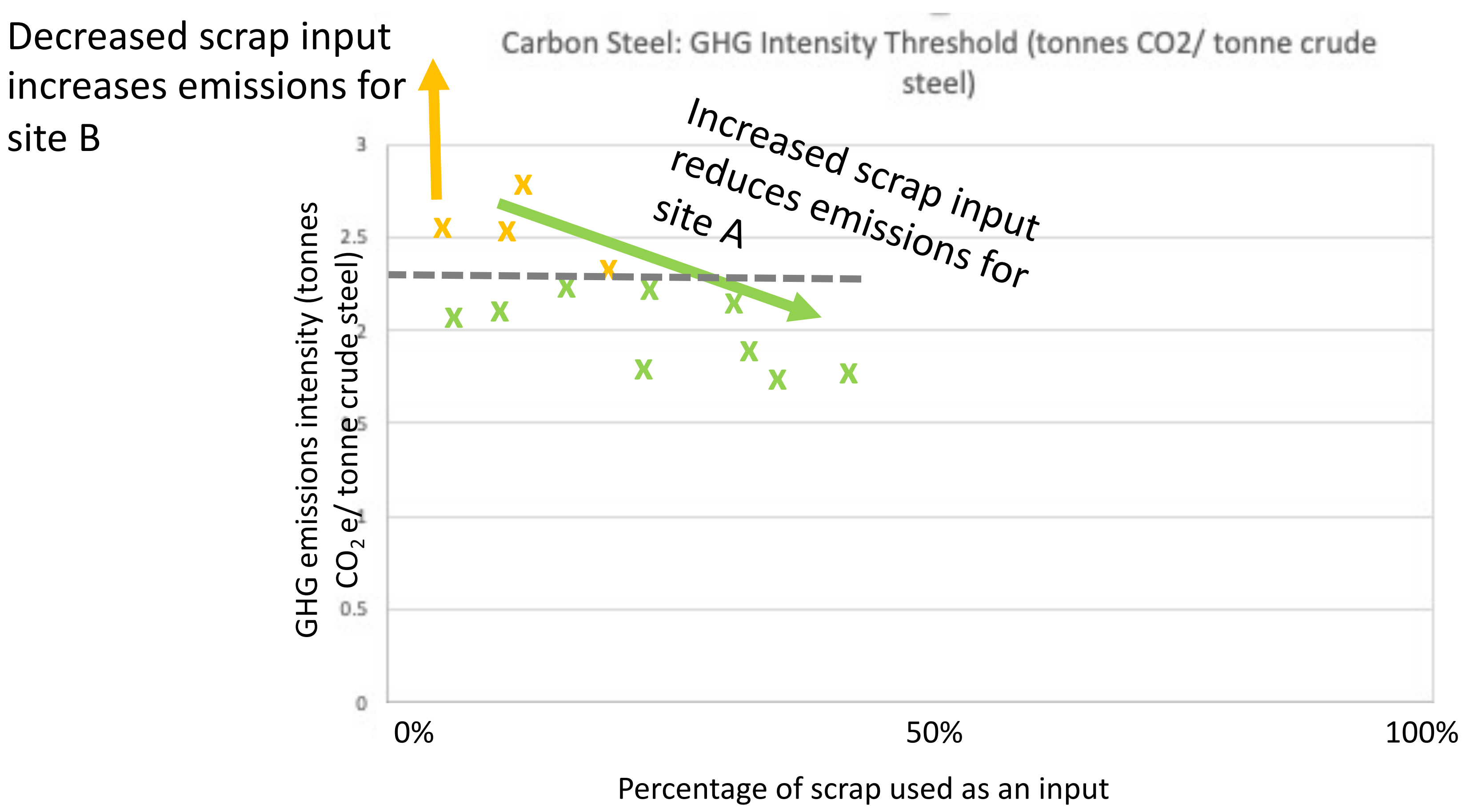


1. Steelmaking, GHG emissions and scrap
2. **Why specifying low embodied carbon steel is not enough**
3. A better way to measure performance and drive lower emissions

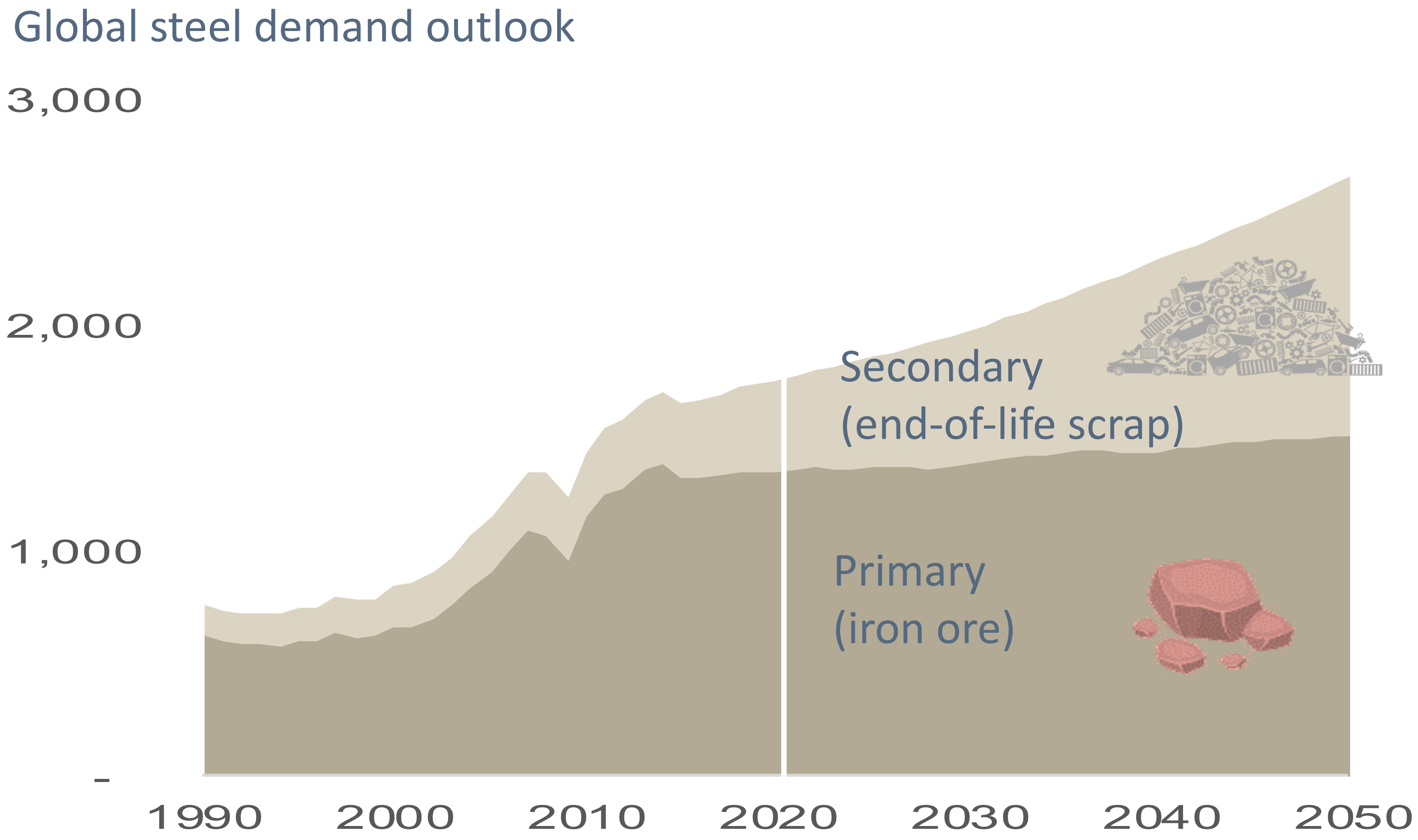
If scrap supply is limited, a simple focus on emissions can drive perverse outcomes



If scrap supply is limited, a simple focus on emissions can drive perverse outcomes



And scrap supply *is* limited

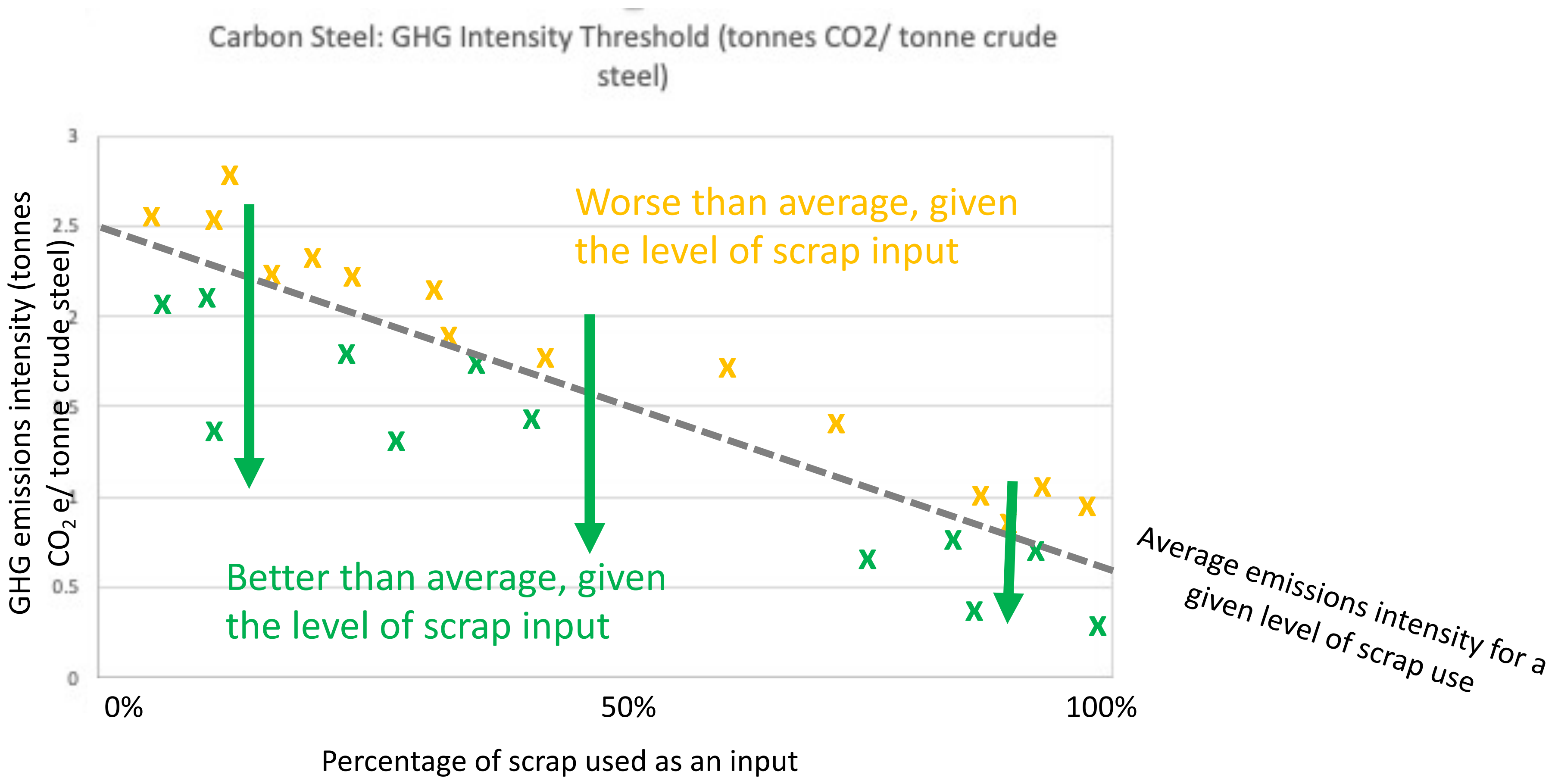


Source: ArcelorMittal

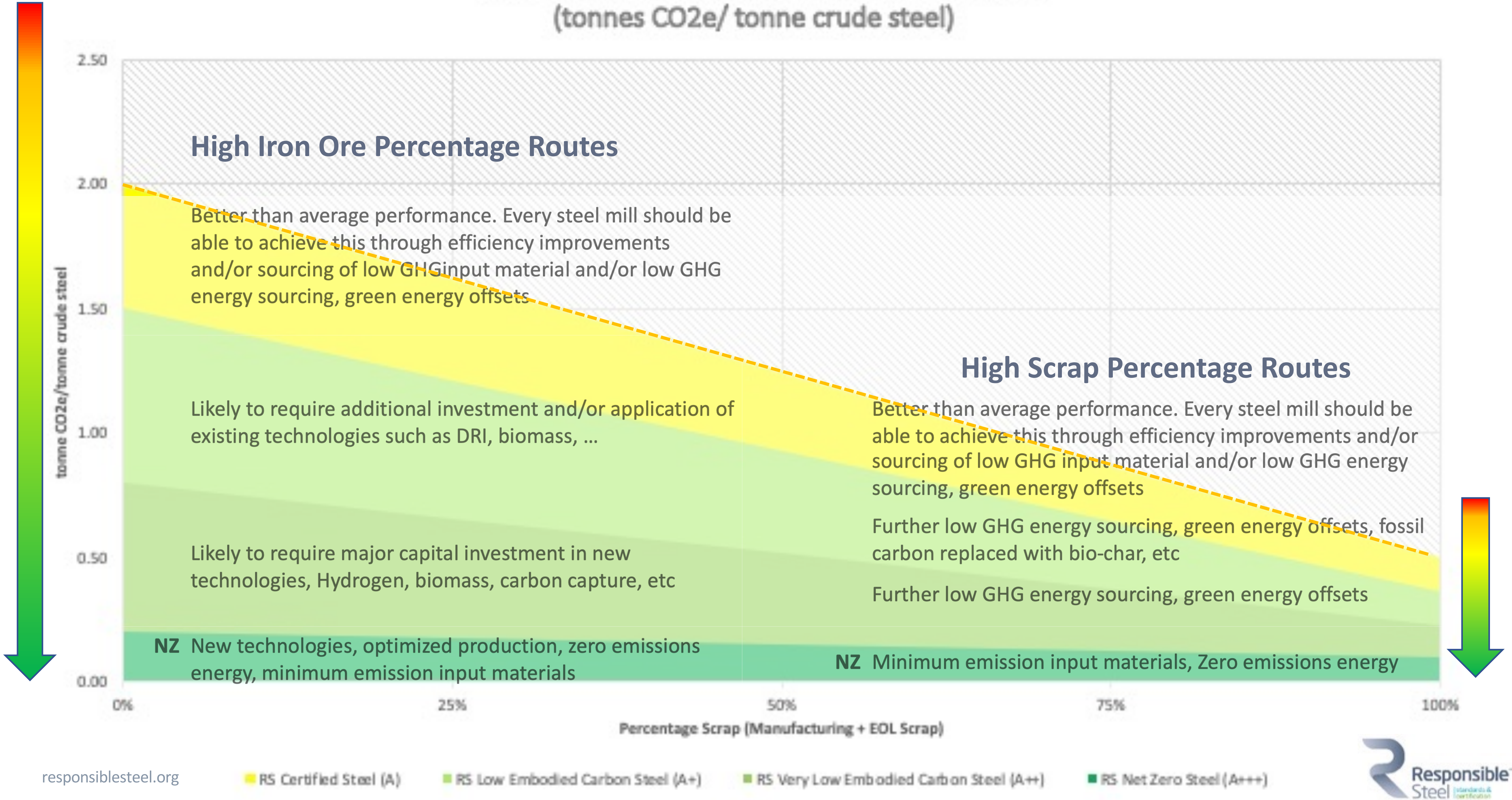
From Net Zero Steel Pathway Methodology Project

1. Steelmaking, GHG emissions and scrap
2. Why specifying a low embodied carbon threshold for steel is not enough
3. **A better way to measure performance and support lower emissions**

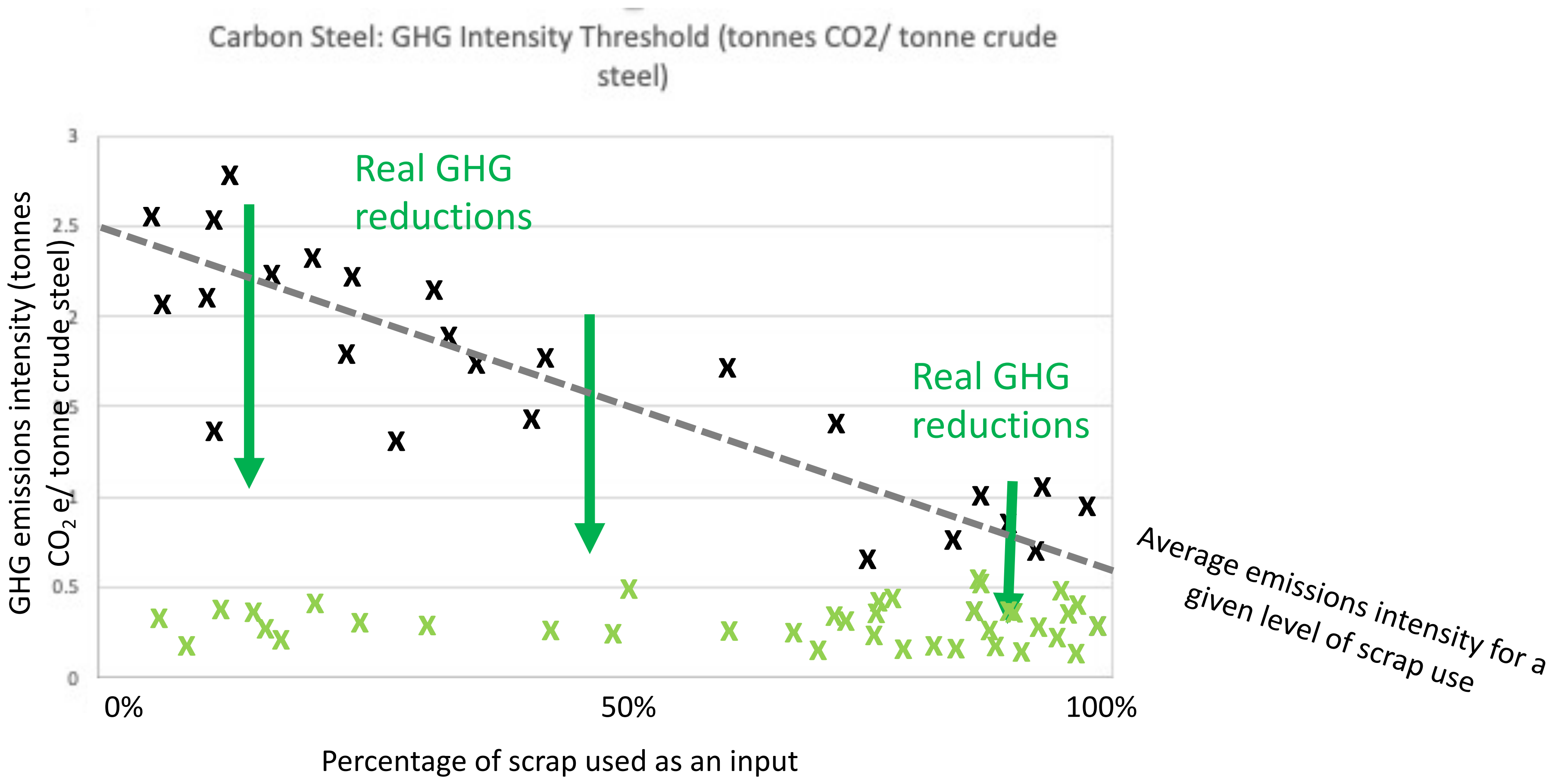
A better way to measure performance and support lower emissions



Carbon Steel GHG Intensity Performance Bands
(tonnes CO2e/ tonne crude steel)



An emissions intensity measure is not enough on its own…



We also need decarbonisation pathways, targets and commitments…

International Energy Agency

Energy Transitions Commission

We Mean Business Coalition

Mission Possible Partnership

ACT Assessing Low Carbon Transition®

Climate Group SteelZero

Science Based Targets – Driving ambitious corporate climate action

RMI – Energy. Transformed.

Systemiq

Race to Zero

Net Zero Steel Pathway Methodology Project

ArcelorMittal

BlueScope Steel

Tata Steel

GFG Alliance

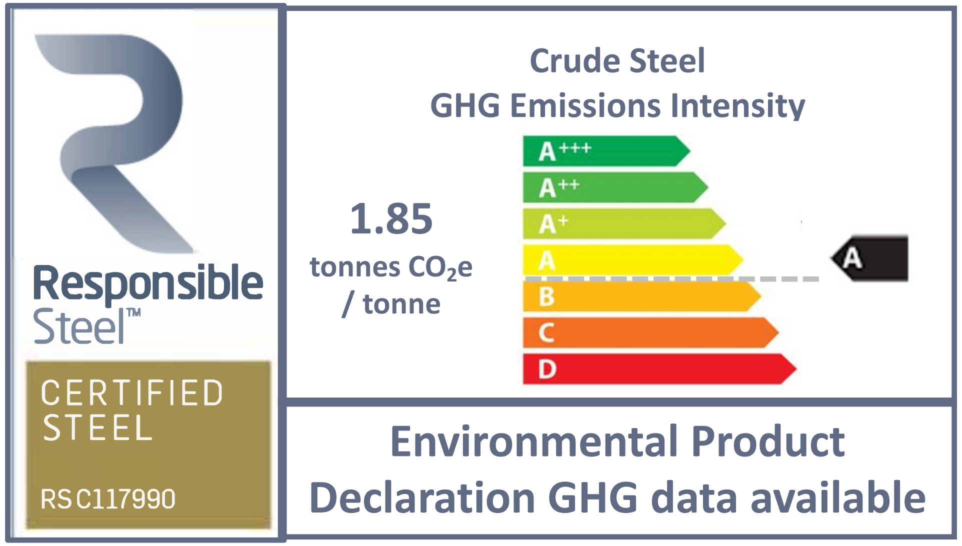
ResponsibleSteel

worldsteel Association

Center for Climate Aligned Finance

• An SBT/ Net Zero Target: the company or site has a science-based targets for decarbonization aligned with the achievement of the Paris Agreement: SBT/ net zero	Drives and rewards planning and commitment to new technologies
• GHG emissions intensity performance for crude steel production that takes account of the proportion of scrap used as an input material	Drives and rewards low GHG steel production, irrespective of production route and the proportion of scrap
• Steel product level carbon footprints – embodied carbon in the purchased product	Measures embodied carbon for the end user, supports end user target setting and tracks success over time

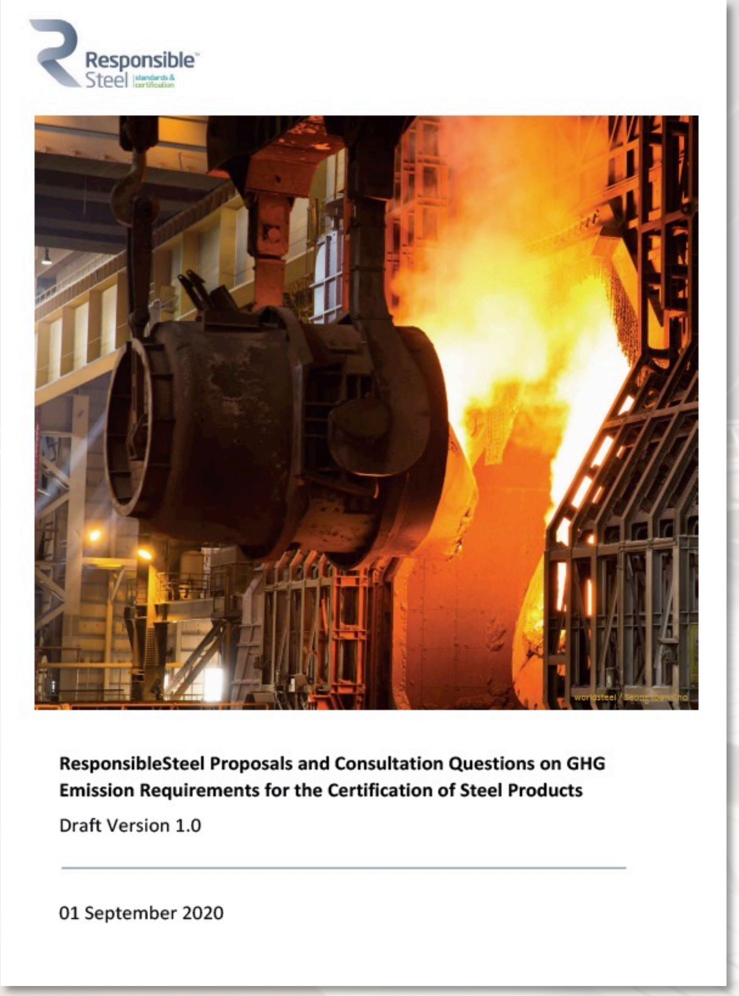
ResponsibleSteel Certified Steel



Label mock-up for illustration only
Labelling/ claims options under discussion
*Input materials specifications not illustrated

- Steelmaker has a credible science-based decarbonisation target, aligned with achievement of the goals of the Paris Agreement
- Steelmaker implements TCFD recommendations
- Steel production site meets all 12 Principles of the ResponsibleSteel Standard
  - Responsible sourcing of input materials
  - Crude steel GHG emissions intensity performance threshold met, taking account of scrap input
  - Crude steel GHG emissions intensity performance banding
  - Product GHG footprint data available through environmental product declaration

ResponsibleSteel Standard: ongoing consultation


ResponsibleSteel Proposals and Consultation Questions on GHG Emission Requirements for the Certification of Steel Products

Draft Version 1.0

01 September 2020

DRAFT VERSION 2-0 due out for second public consultation in April, together with requirements for the responsible sourcing of input materials

Further development with members and stakeholders May to September

Finalisation and formal approval by November 2021

Some key questions…

- What value should the threshold be set at?
- A single threshold, or several performance bands?
- Scope boundaries?
- What about stainless steels?
- Disclosure at site level, or allow averages across multiple sites?

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Dr. Paul Butterworth
Head of Analysis, Steel

MARCH 2021

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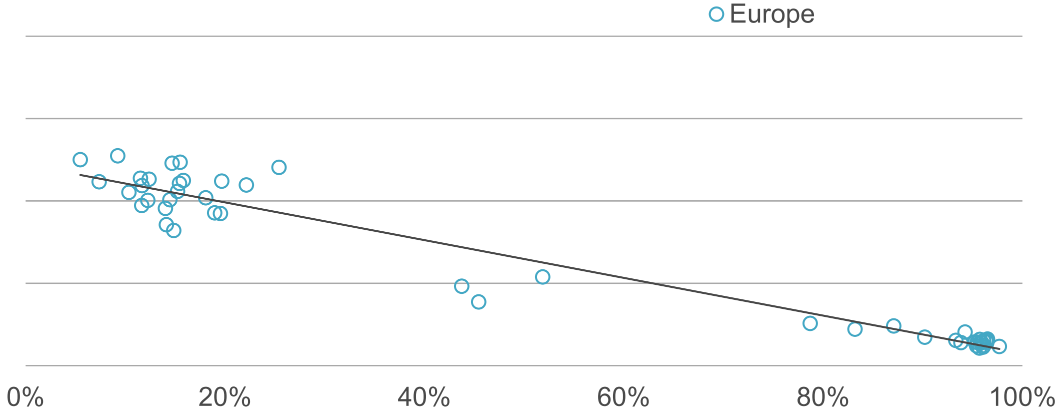
Regional emissions intensity comparison

y-axis: CO_2 intensity, **Scope 1–3**, t-CO_2/t-liquid steel
x-axis: external scrap steelmaking charge, %



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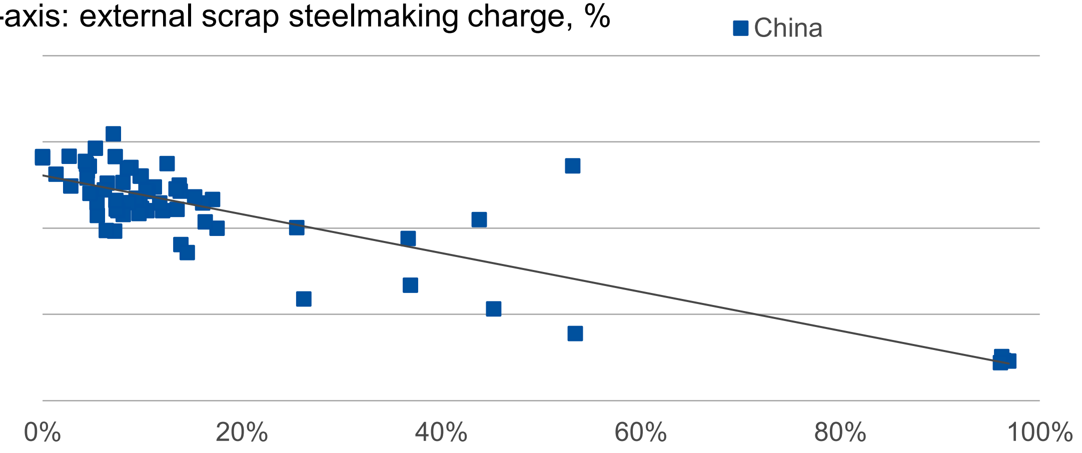

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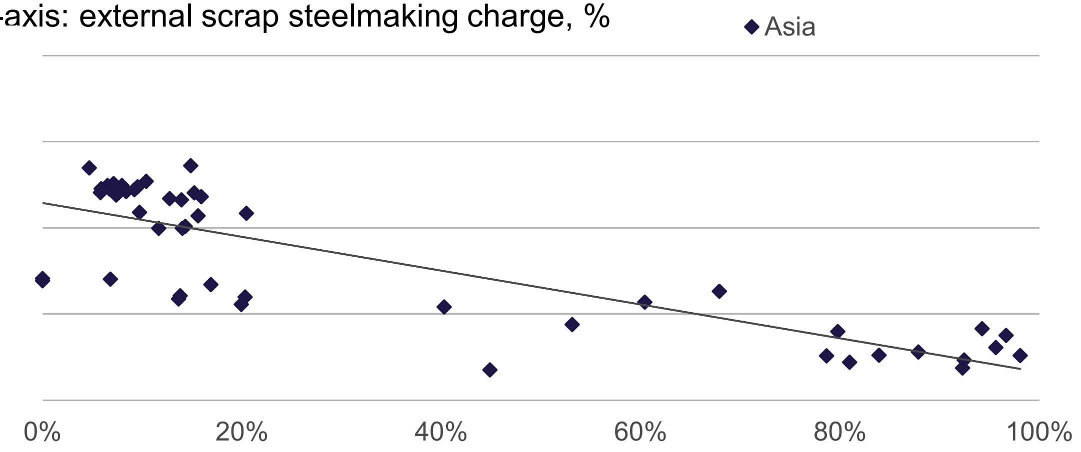

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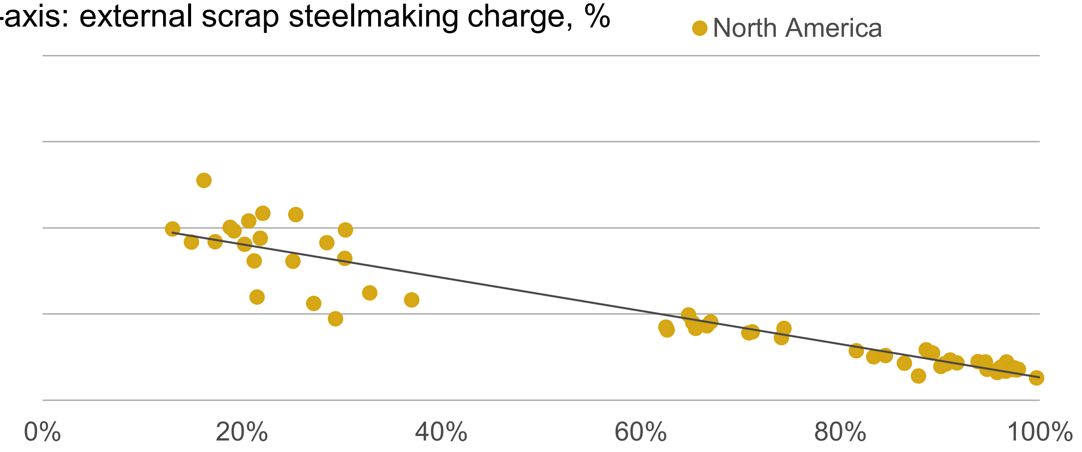
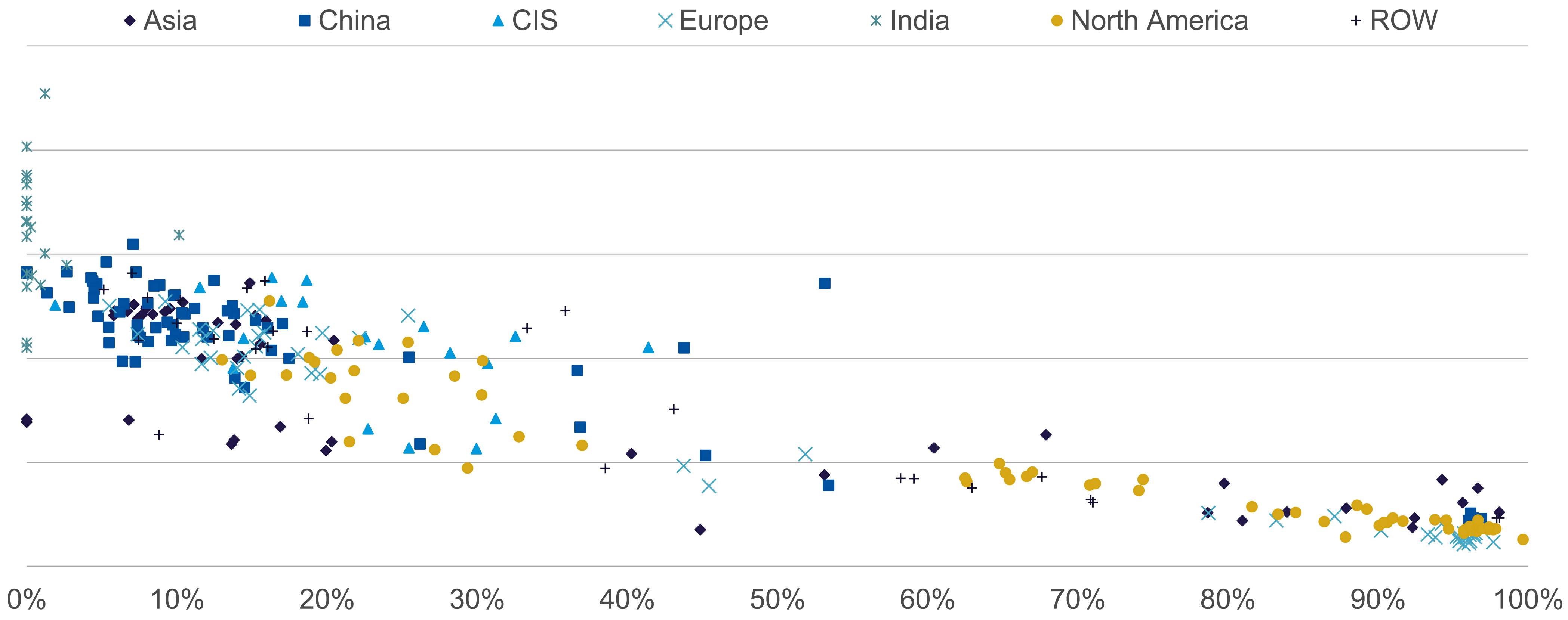


DATA: **CRU Steel Cost Model** and **Emissions Analysis Tool**

Regional emissions intensity overlay

y-axis: CO_2 intensity, **Scope 1–3**, t-CO_2/t-liquid steel

x-axis: external scrap steelmaking charge, %



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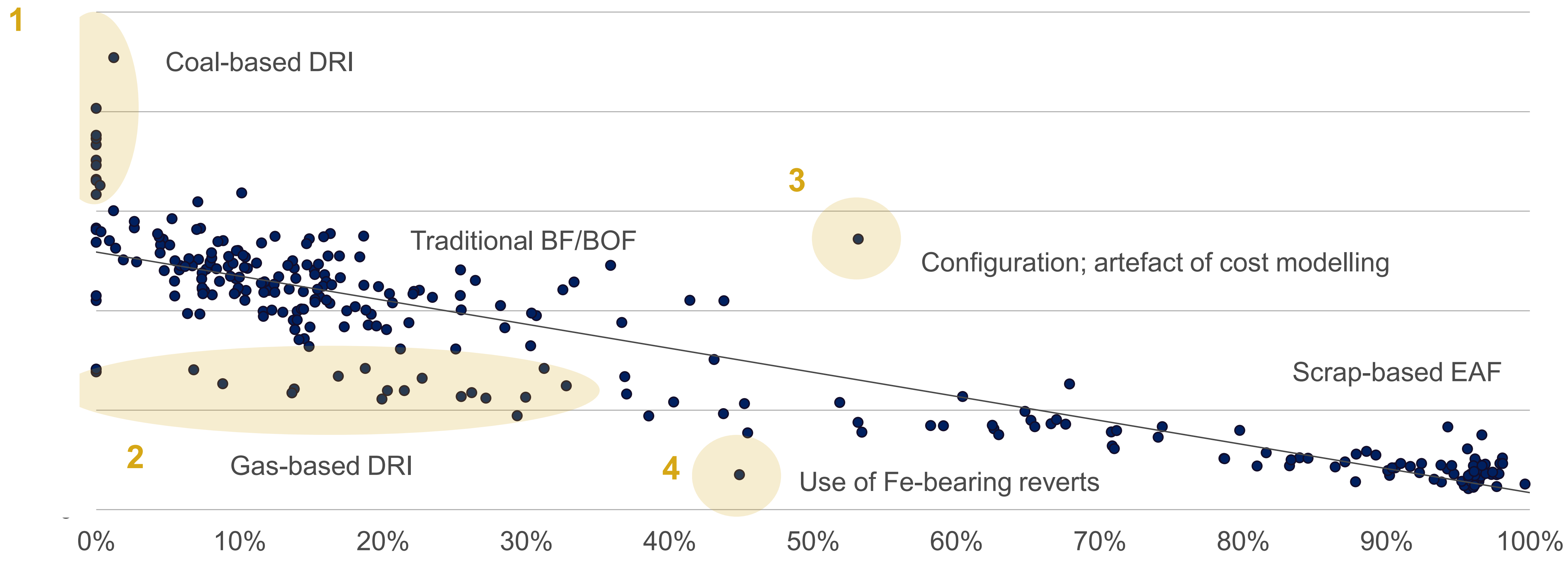
Global emissions intensity

y-axis: CO_2 intensity, **Scope 1–3**, t-CO_2/t-liquid steel
x-axis: external scrap steelmaking charge, %



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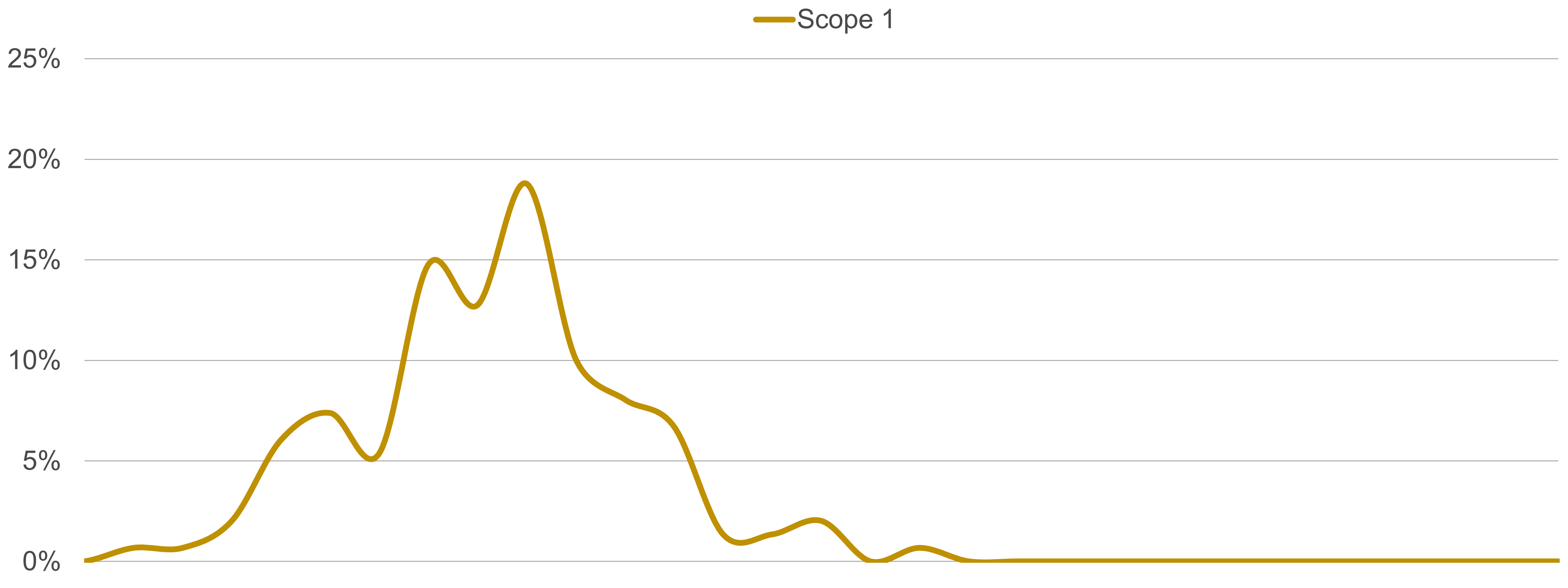
Moving through Scope 1, 2 and 3 – integrated (BF-BOF)

y-axis: frequency, %

x-axis: steelmaking CO_2 intensity, t-CO_2/t-steel



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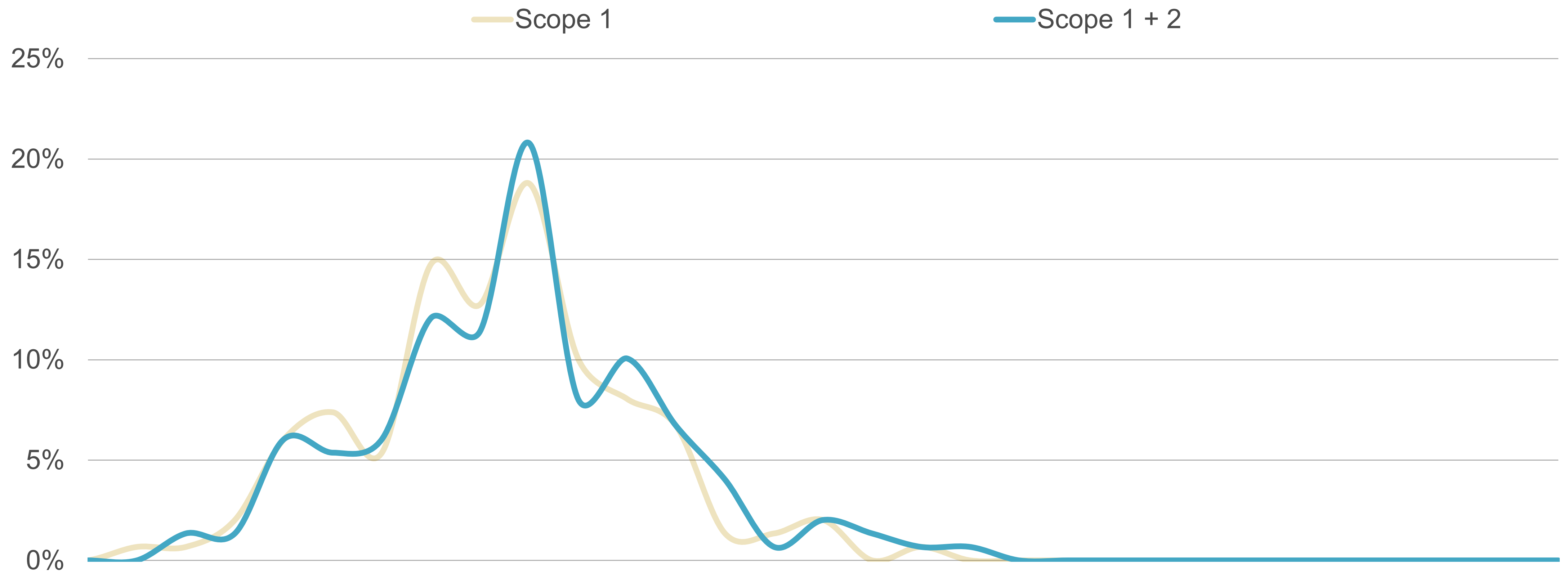

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Moving through Scopes 1, 2 and 3 – integrated (BF-BOF)

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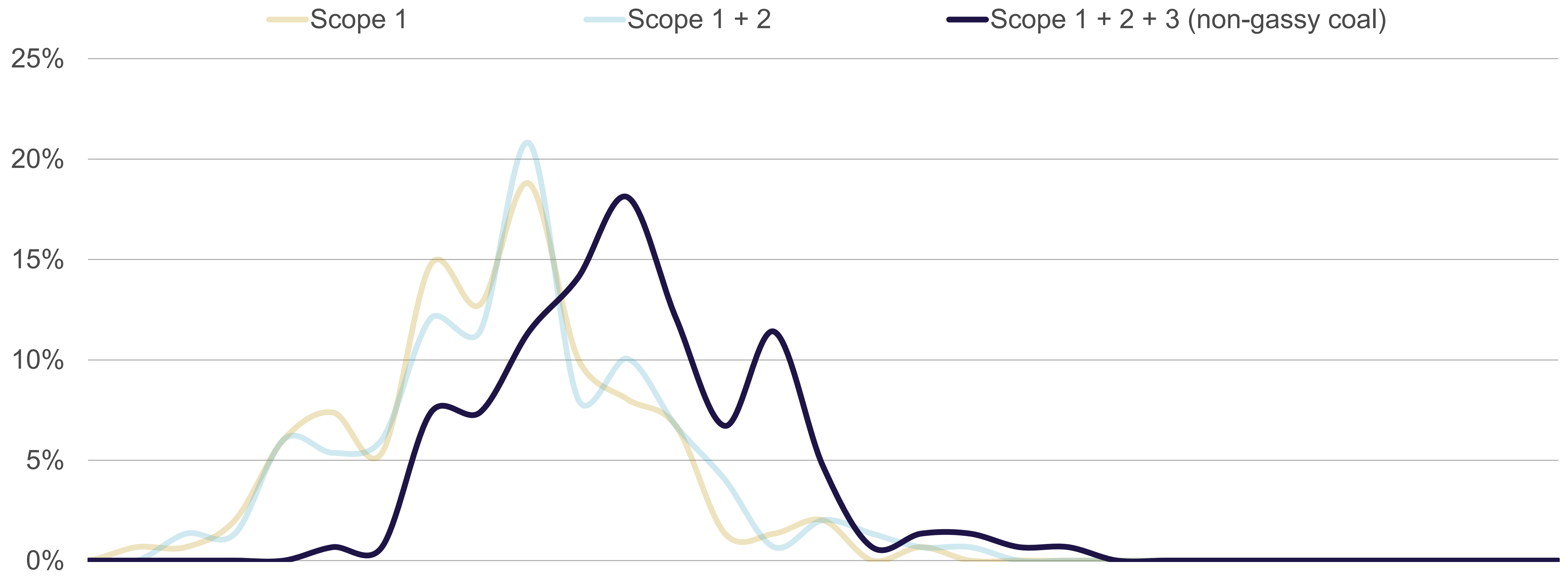

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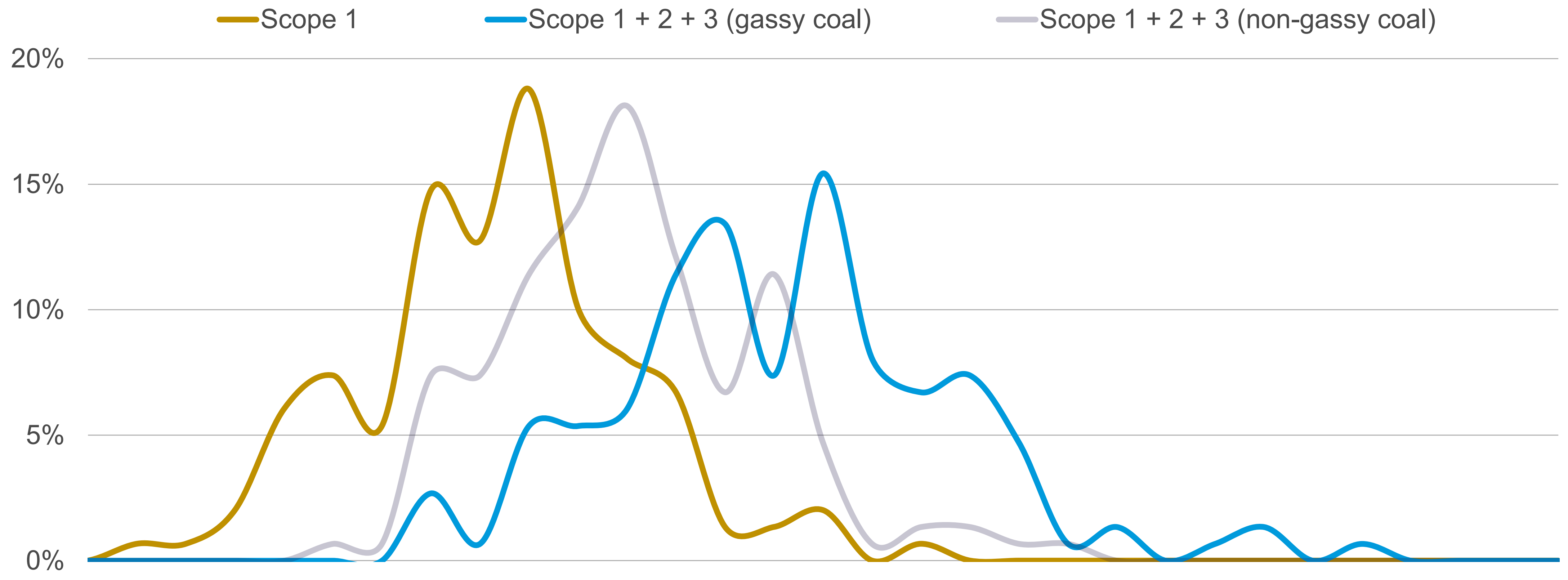
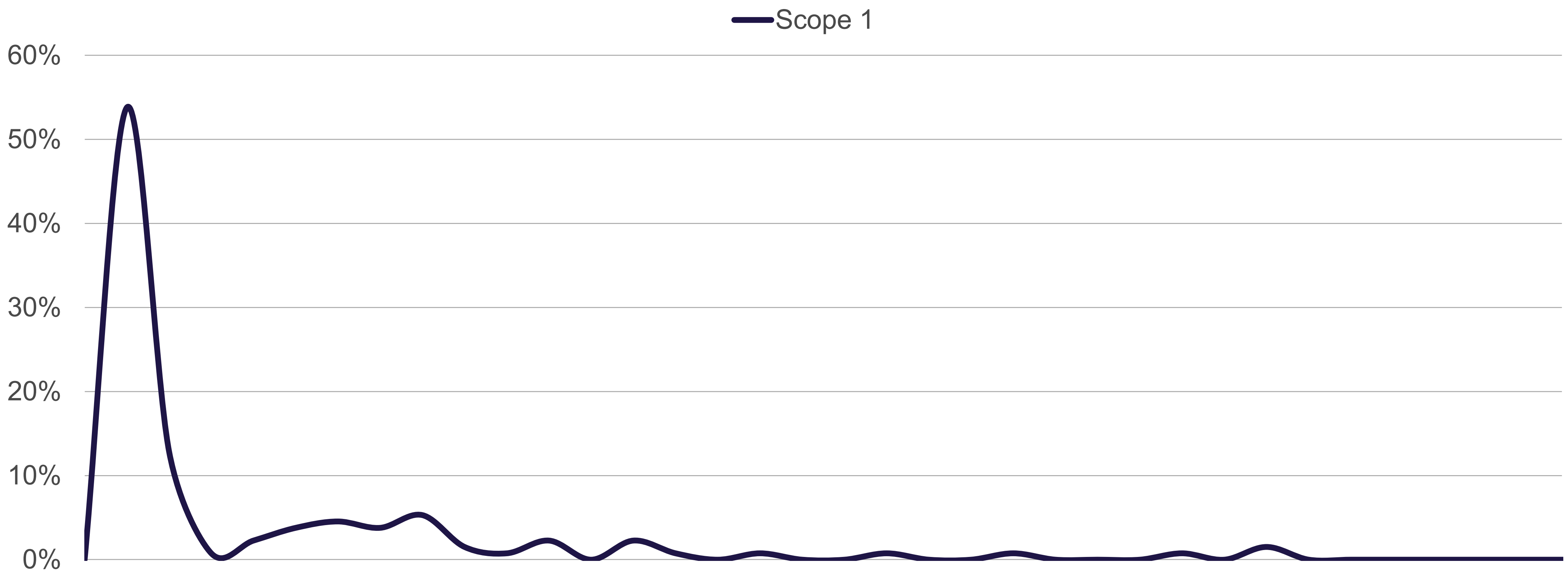


DATA: **CRU Steel Cost Model** and **Emissions Analysis Tool**

Moving through Scopes 1, 2 and 3 – EAF

y-axis: frequency, %

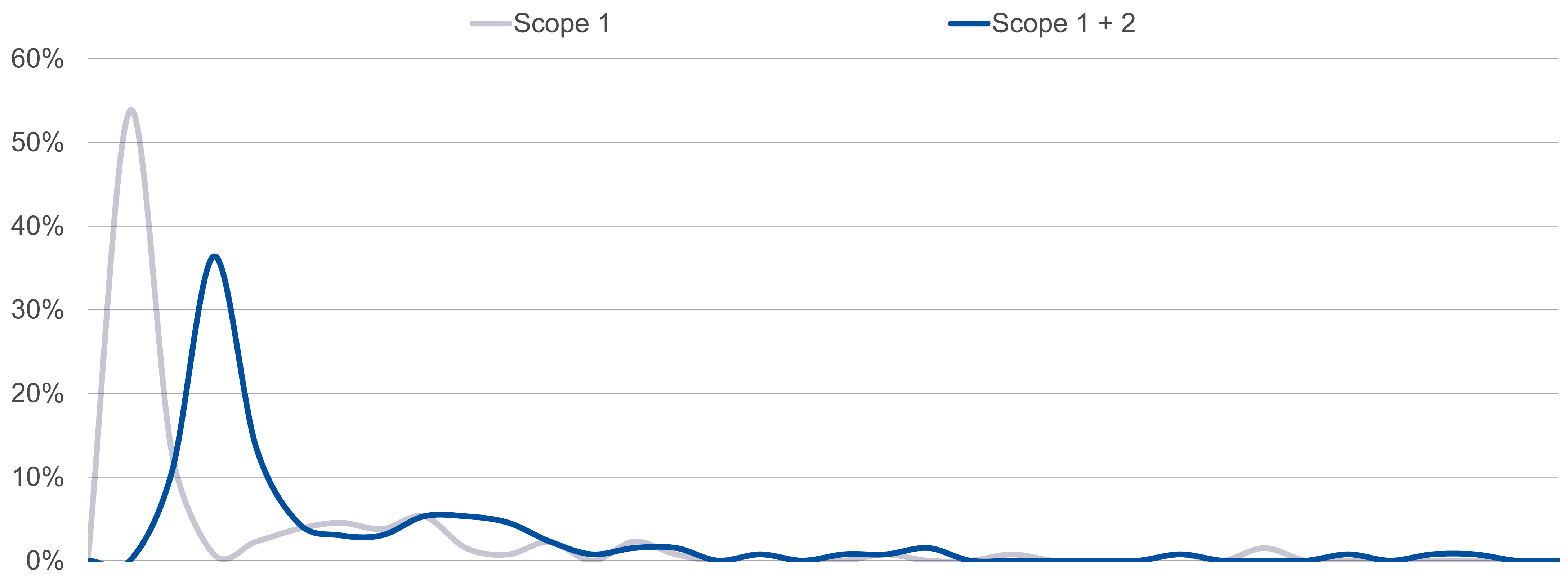
x-axis: steelmaking CO_2 intensity, t-CO_2/t-steel



Moving through Scopes 1, 2 and 3 – EAF

y-axis: frequency, %

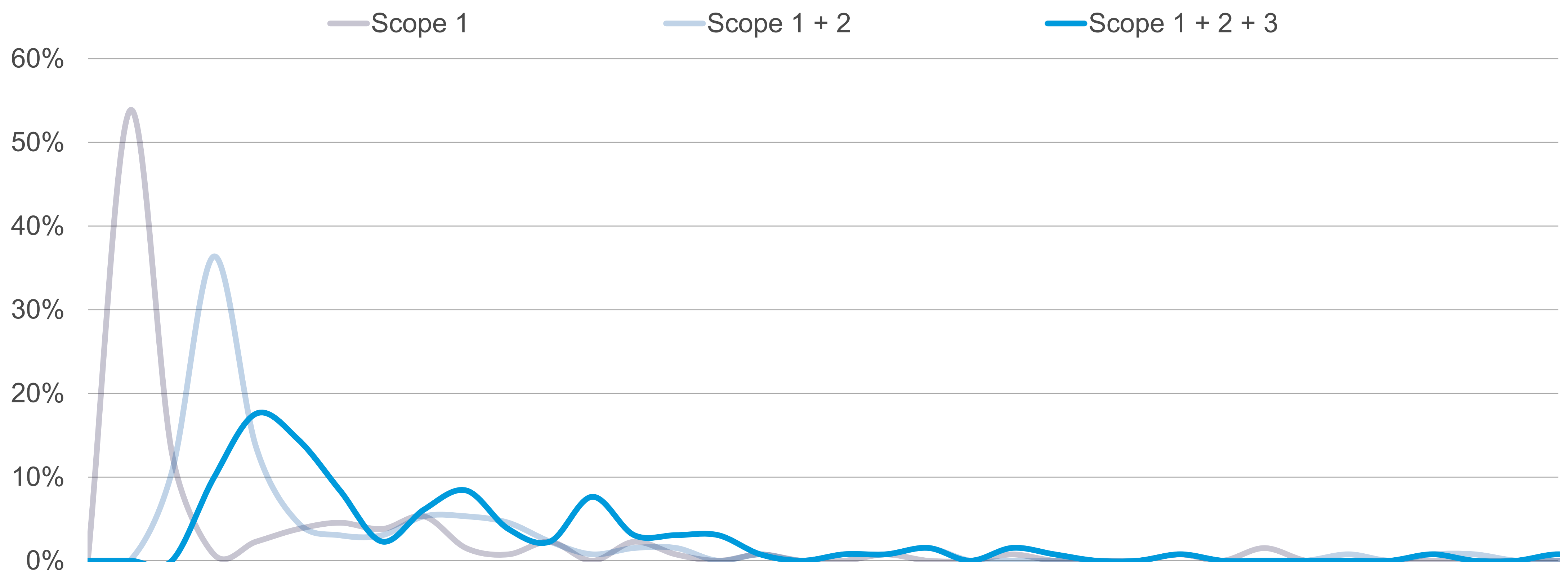
x-axis: steelmaking CO_2 intensity, t-CO_2/t-steel



Moving through Scopes 1, 2 and 3 – EAF

y-axis: frequency, %

x-axis: steelmaking CO_{2e} intensity, t-CO_2/t-steel

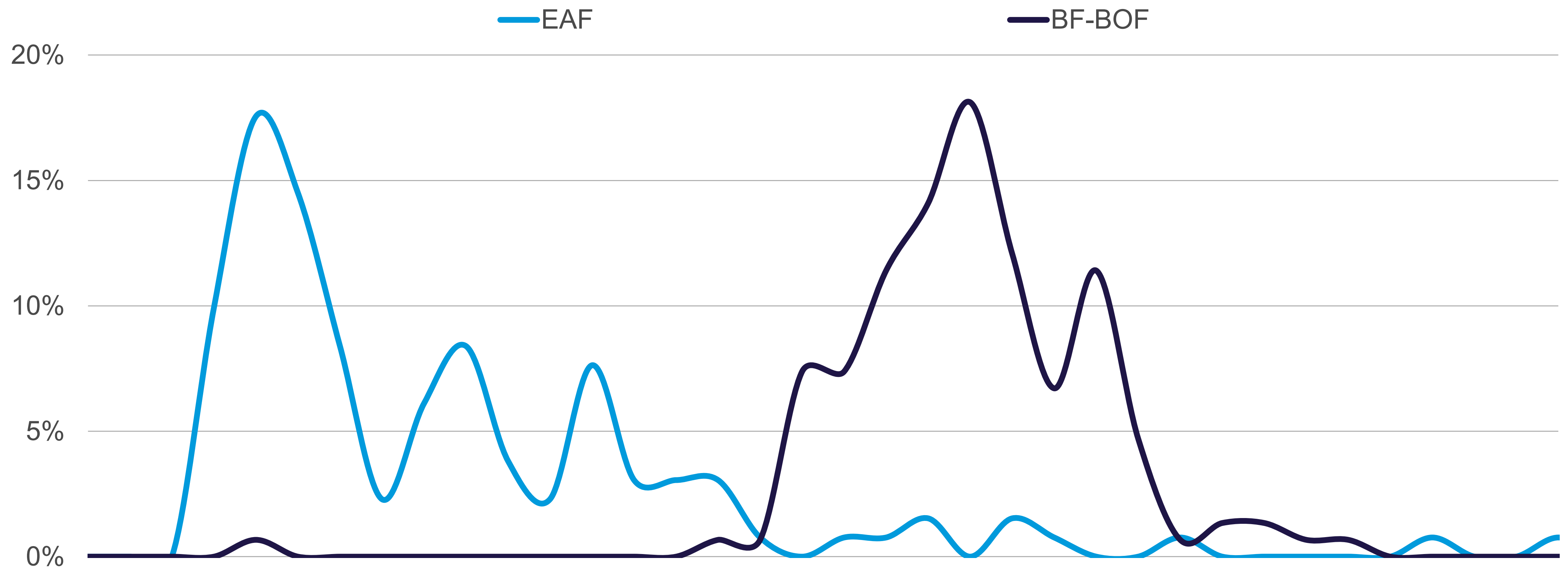


DATA: **CRU Steel Cost Model** and **Emissions Analysis Tool**

Comparing sectors – BF-BOF vs EAF, Scope 1, 2 and 3

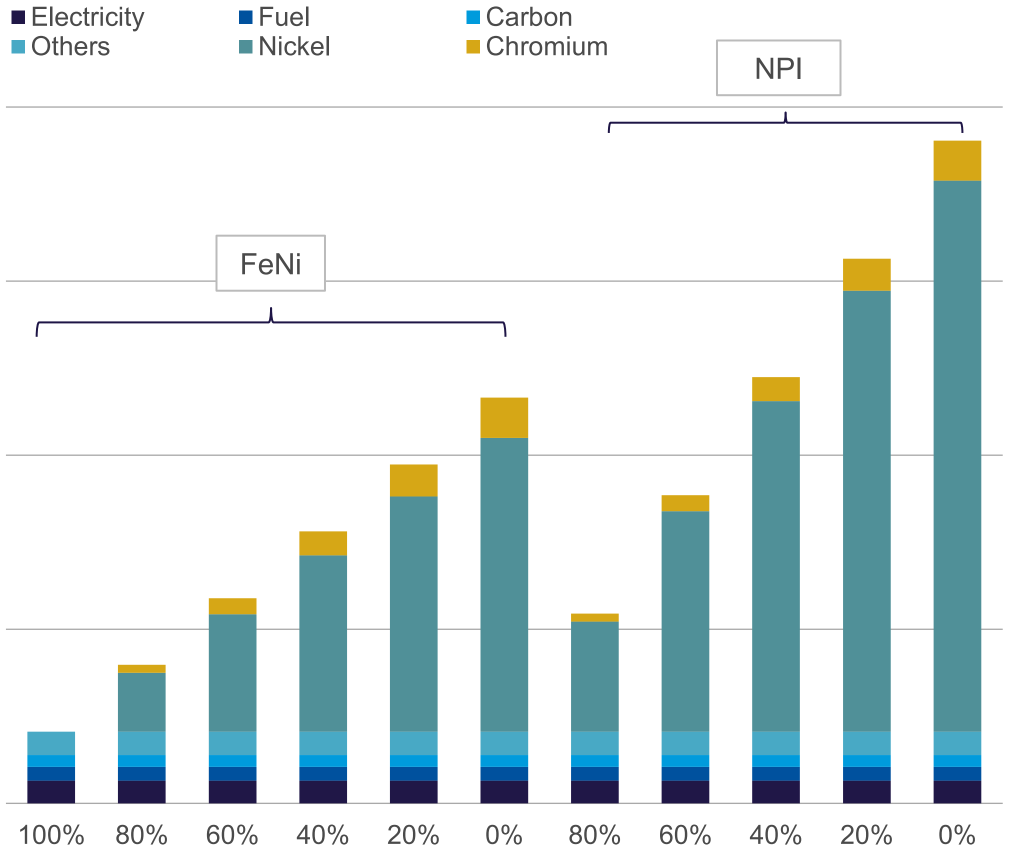
y-axis: frequency, %

x-axis: steelmaking CO_{2e} intensity, **Scope 1–3**, t-CO_2/t-steel

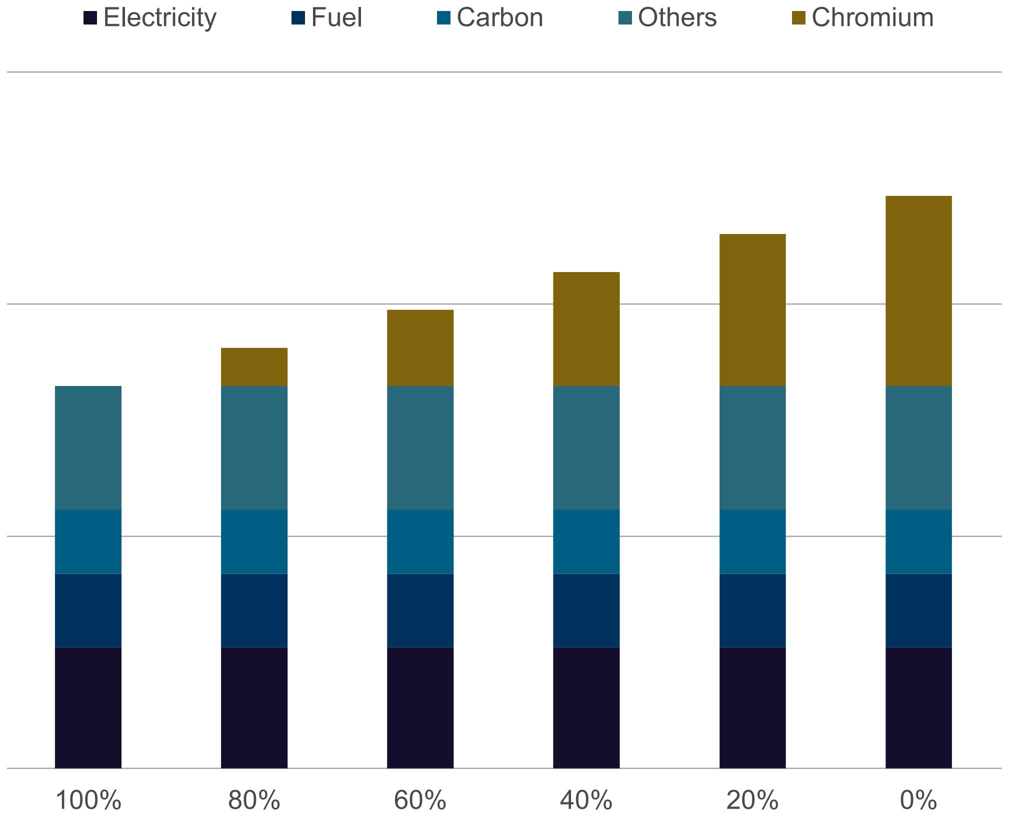


Stainless steel emissions (conceptual): austenitic and ferritic grades

y-axis: CO_2 emissions, **Scope 1–3**, 304-grade (austenitic), t-CO_2/t-HRC
x-axis: stainless scrap consumption, % gross metallic charge



y-axis: CO_2 emissions, **Scope 1–3**, 430-grade (ferritic), t-CO_2/t-HRC
x-axis: stainless scrap consumption, % gross metallic charge



DATA: **CRU Stainless Steel Cost Model, CRU Nickel Cost Model**

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