

IRENA INNOVATION WEEK ²⁰/₂₃

Solutions to decarbonize the iron and steel sector

Organised in partnership with

worldsteel
A S S O C I A T I O N

11:30-13:00 | 26 September 2023

#IIW2023

Scene-setting presentation



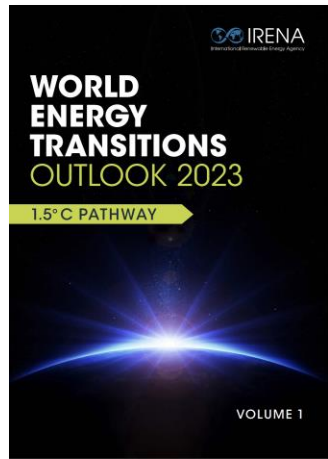
Luis Janeiro

Team Lead, End-use sectors

IRENA Innovation and Technology Centre

Recent work by IRENA on end-use sectors

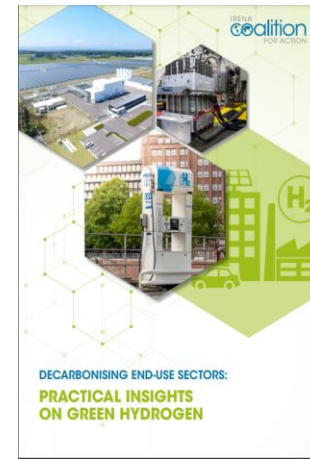
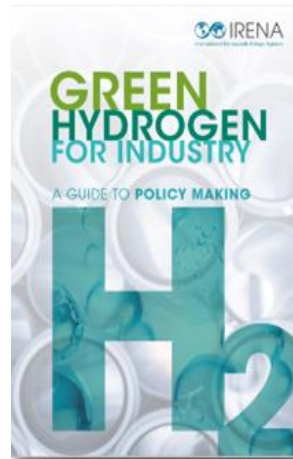
End Use Sectors



Electrification



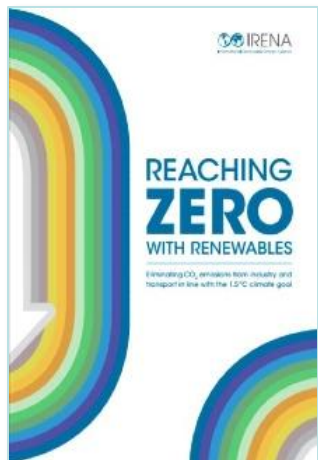
Hydrogen



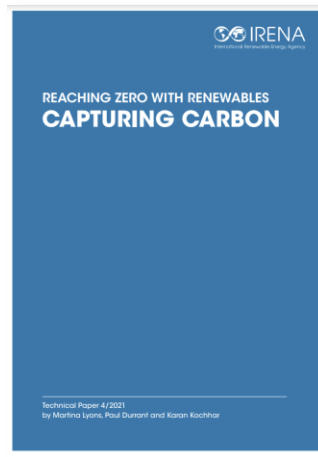
E-fuels/Chemicals



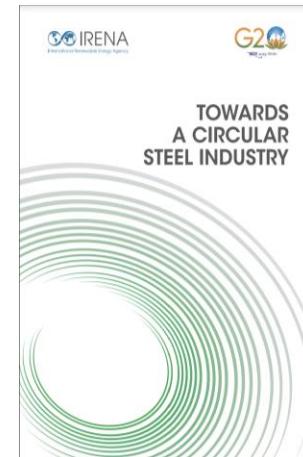
Hard to Abate Sectors



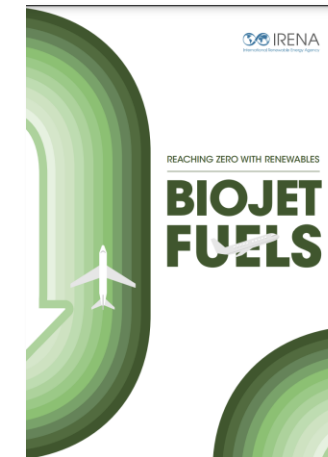
CCS and BECCS



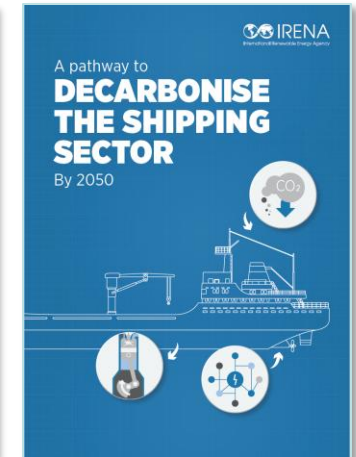
Iron and Steel



Aviation



Shipping



IRENA Alliance for Industrial Decarbonization

The objective of the Alliance is to enhance dialogue and coordinated action among the members towards

- » Raising aspiration for decarbonization, aligned with global and national decarbonization ambitions.
- » Support the development & implementation of decarbonization strategies, leveraging renewable energy.
- » Stimulating the exchange of knowledge and best practices among practitioners.
- » Engaging with global and regional energy and climate platforms to foster action for decarbonising end-use sectors, particularly industry.



Total 55 members and partners with IRENA as Alliance Secretariat host

Steel plays a critical role in society

Steel is everywhere around us, from buildings and vehicles to appliances and daily products.

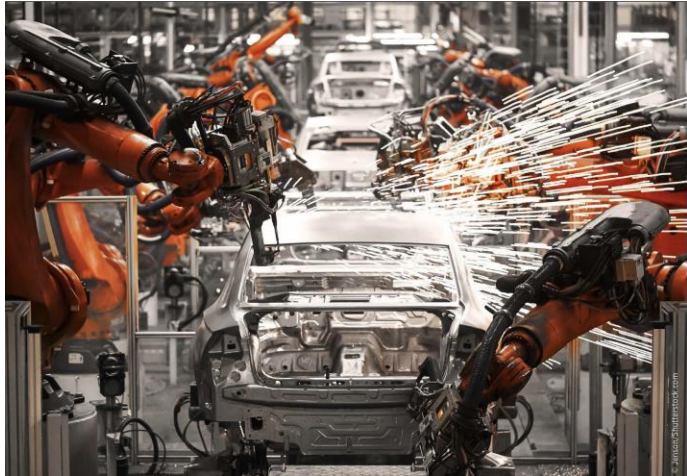
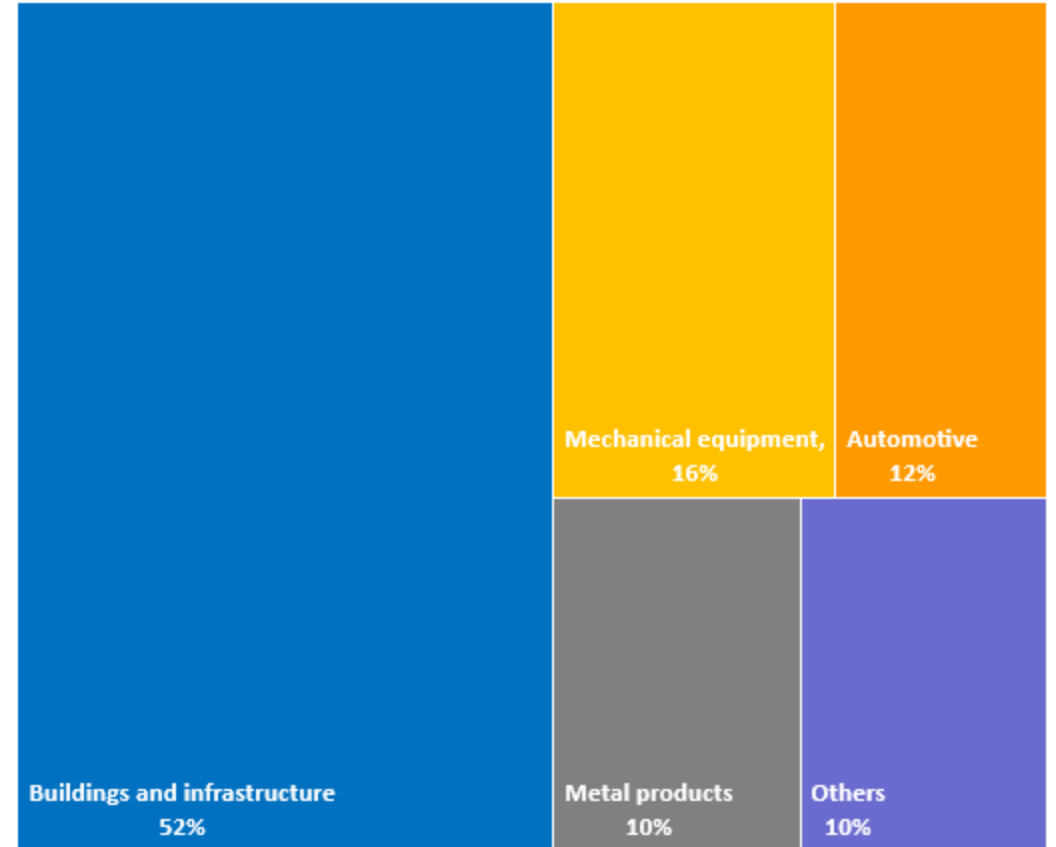
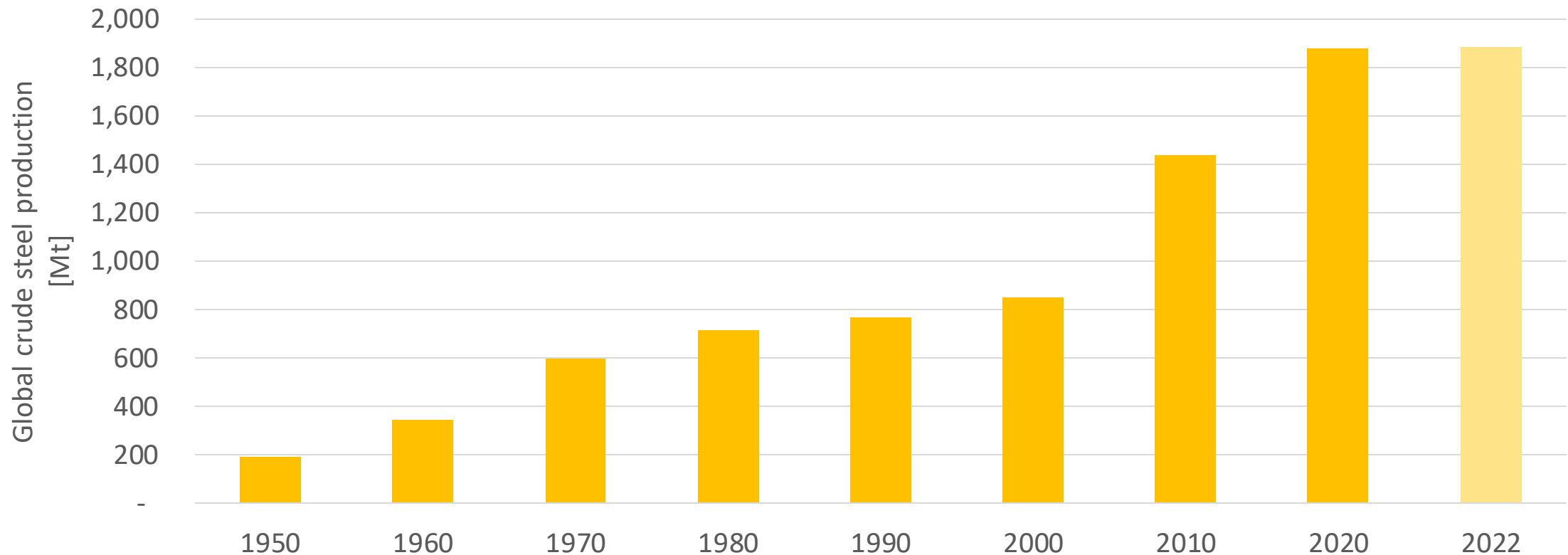


Figure 1 Breakdown of steel demand by sector



Steel production has grown with economic progress

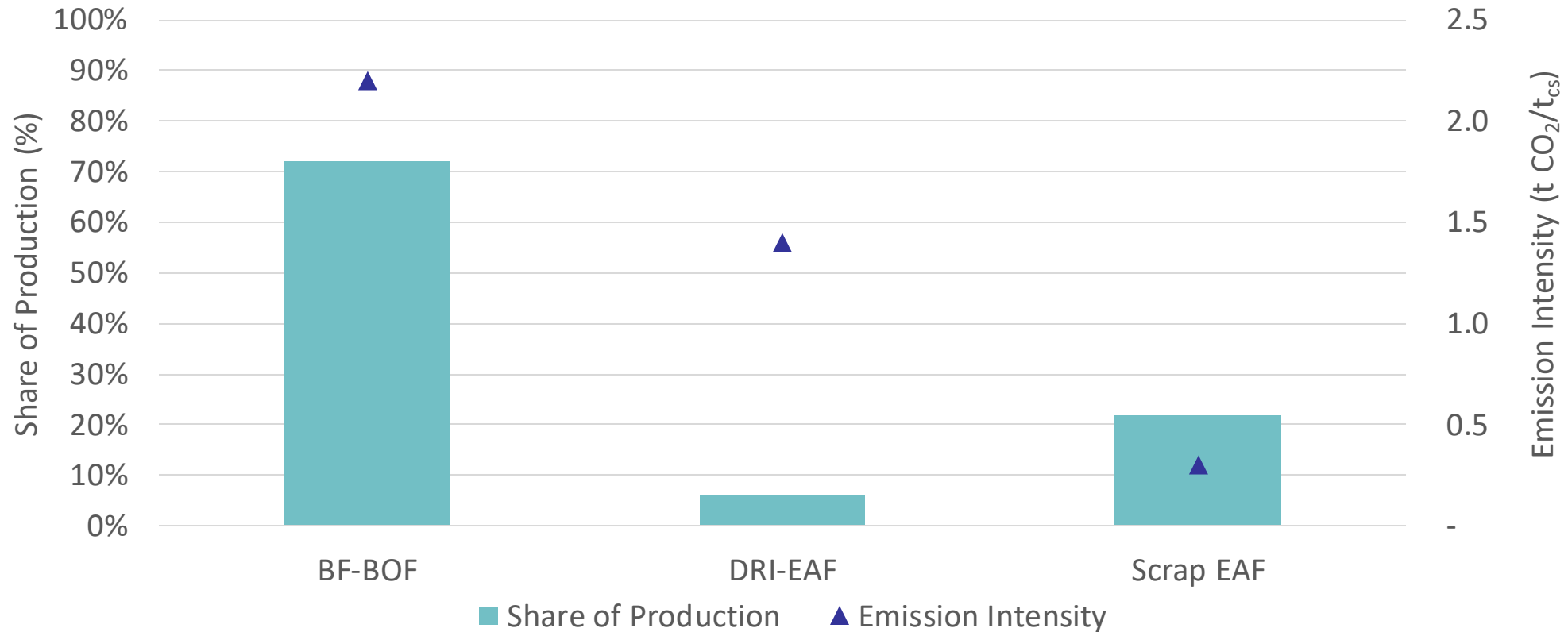
Figure 2 Annual global crude steel production



Steel **production** has **risen** over time- from just **190 Mt** in **1950** to almost **2 000 Mt** in **2022**.
Emissions have risen from a **few Mt** to roughly **2 700 Mt** in the same period.

Today, most steel is produced using emission-intensive routes

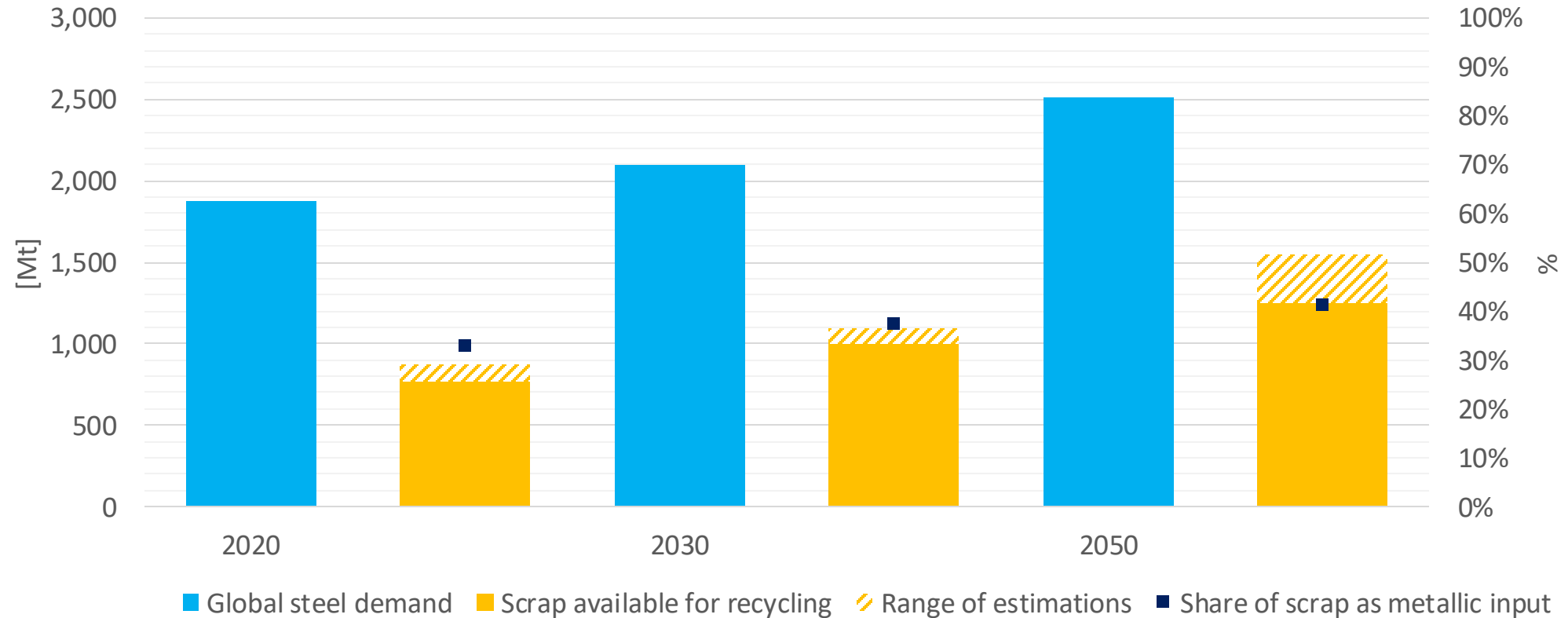
Figure 3 Share of production routes and their estimated emissions intensity



Steel can be produced using **different routes**, but **BF-BOF** is **most widely used** method. It is also the most **carbon intensive route**. **Coal** dominates as the **primary energy carrier** accounting for **three-quarters** of fuel used in 2022.

We need clean solutions for primary steel production

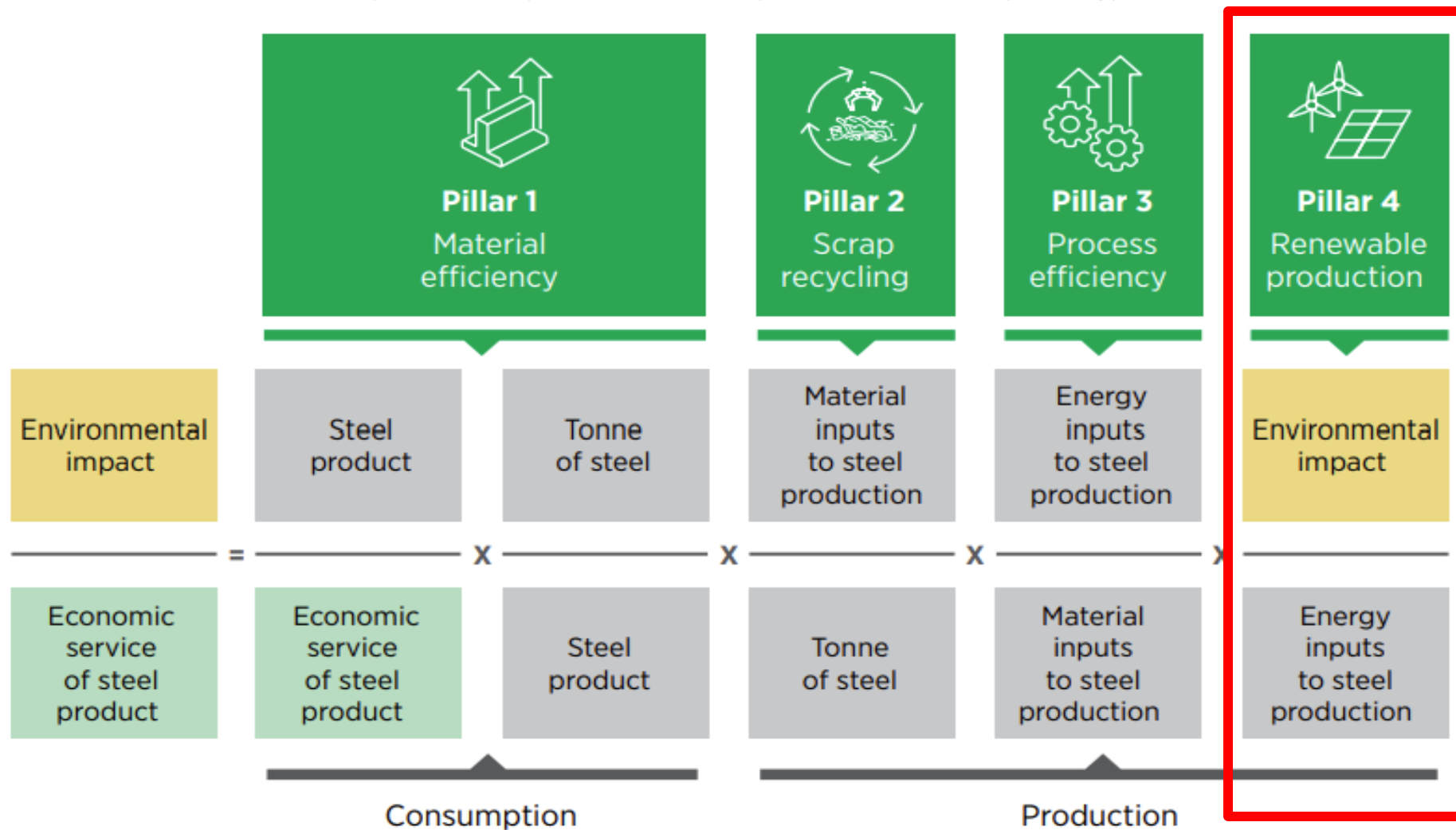
Figure 4 Potential role of recycling in steel production towards 2050



Scrap recycling could account for **almost half of global steel demand** by 2050.
Primary production will have to fill in the for the remaining demand.

Key levers to reduce environmental impact of the steel sector

Figure 5 Key factors of the environmental impact of steel products, and four pillars for a circularity strategy



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Panel discussion

Moderator



Andrew Purvis

World Steel Association

Panellists



Christopher Gusek

H2 Green Steel



Robert Jan Jeekel

ArcelorMittal Europe



José Noldin

GravitHy



Samuel Flückiger

**thyssenkrupp Steel
Europe**

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Closing remarks



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Thank you!

