

ESTEP SPRING DISSEMINATION EVENT

17-18 FEBRUARY 2026 - BRUSSELS (BELGIUM)

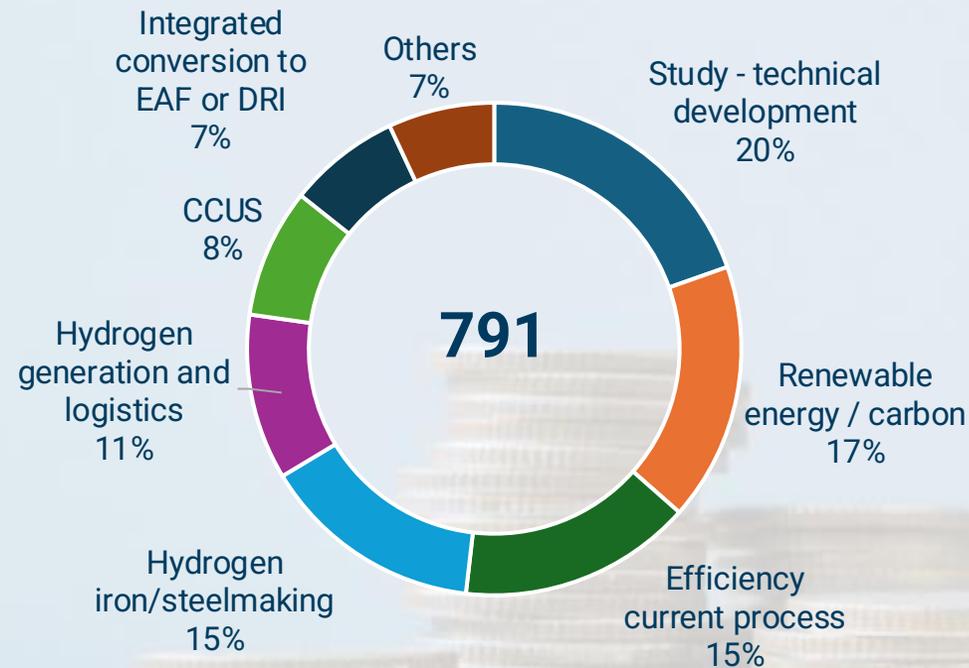
Challenges and opportunities for the European steel industry in transition

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Global decarbonization progress is slowing

Announced green iron & steel projects globally by type



- **791** green iron & steel projects were announced globally over the last 10 years (GMK Center data).
- **275** steelmaking sites are engaged in green transformation.
- In 2025, only 18 projects (**2.3%**) reported some progress. 61% of them involved hydrogen-based steelmaking.
- In 2023, new green steel projects averaged 11 media mentions per month, in 2025 – just 7.

+128

new projects in
2023

+109

new projects in
2024

+81

new projects in
2025

Companies have 4 years to meet 2030 decarbonization goals

2030 decarbonization goals

 - **25% (Group)** compared to 2018
- **35% (Europe)** compared to 2018


thyssenkrupp - **30%** compared to 2018

voestalpine - **30%** compared to 2019

 **SALZGITTERAG**
Stahl und Technologie - **50%** compared to 2018

 **United States Steel** - **20%** compared to 2018

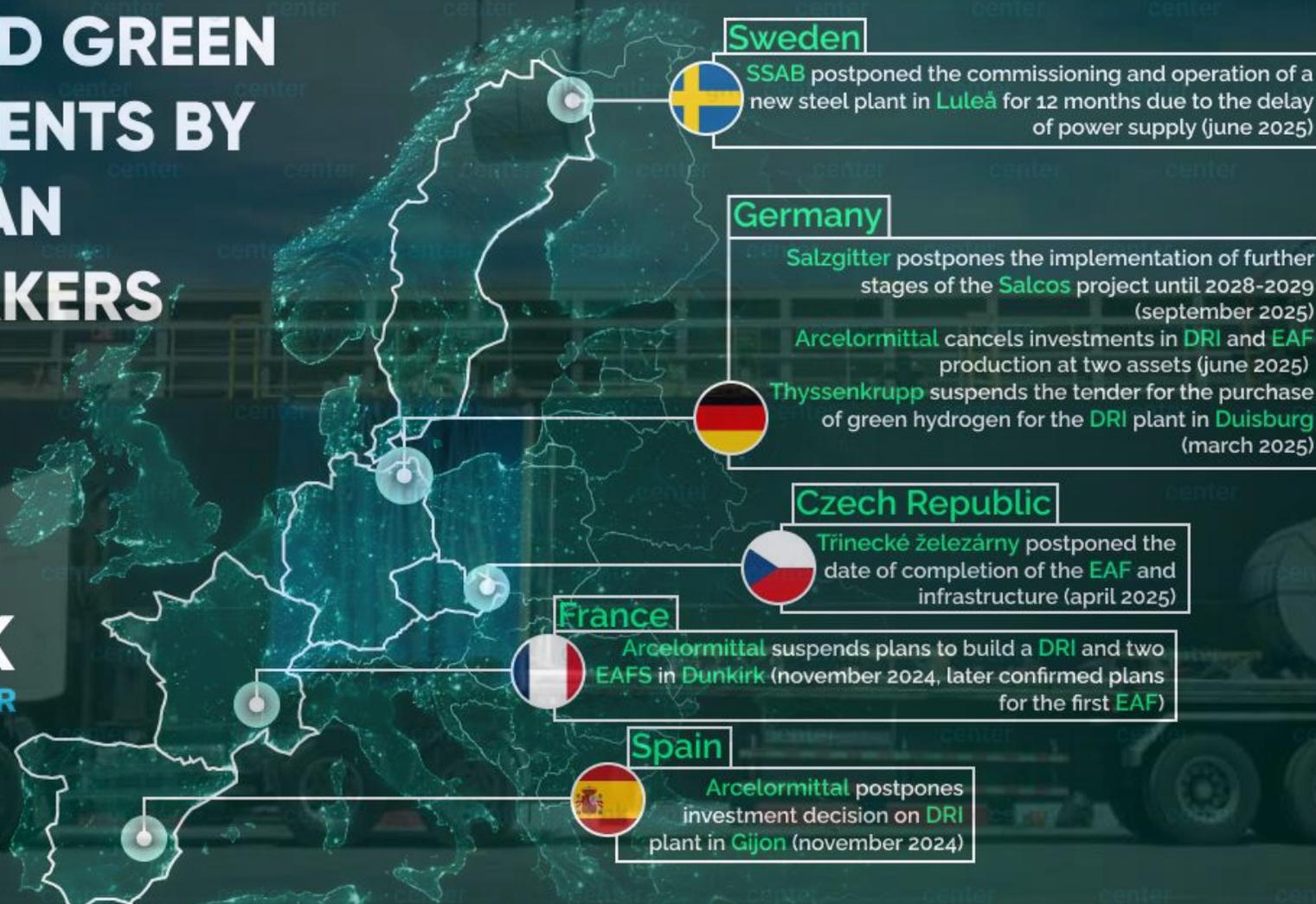
 **NIPPON STEEL** - **30%** compared to 2013

 **CLIFFS** - **25%** compared to 2017

- Steel companies set decarbonization goals to different base years.
- Winners are those who set targets to years when their emissions actually peaked.
- US Steel, ArcelorMittal (Group), Cleveland Cliffs have already met their 2030 targets. Nippon Steel is 6.6% away.
- European steel companies with ambitious targets will struggle to meet them.
- For example, voestalpine needs to cut emissions by 22.3% (compared to 2023), thyssenkrupp – by 24.9% (compared to 2023), Salzgitter – by 55.3% (compared to 2024).

Many European decarbonization projects have stalled

DEFERRED GREEN INVESTMENTS BY EUROPEAN STEELMAKERS

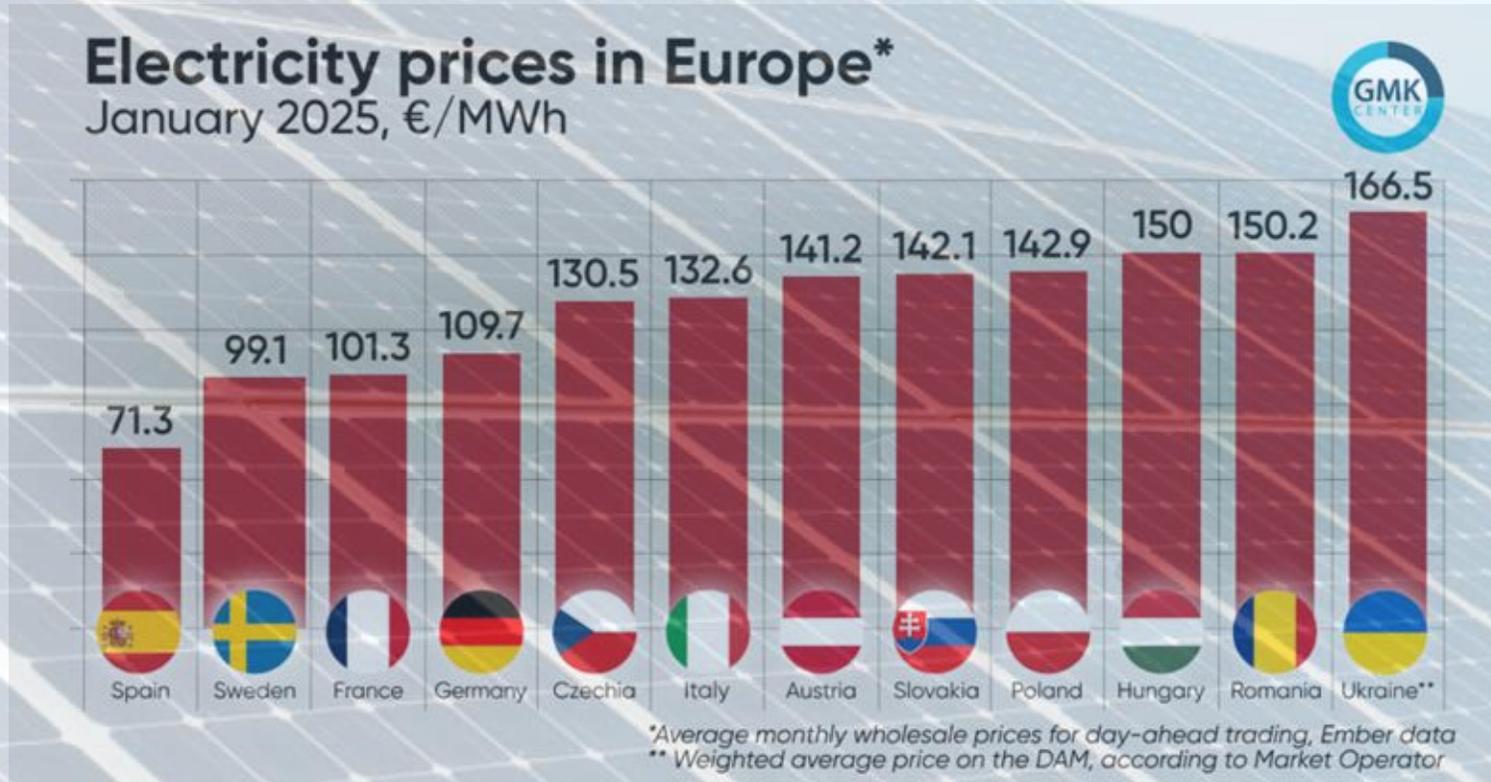


Green steel brands and certification alone can not drive decarbonization

Company	"Green" steel brand
thyssenkrupp Steel	bluemint
ArcelorMittal Europe	XCarb
voestalpine	greentec
Salzgitter	SALCOS
Kobe Steel	Kobenable
POSCO	Greenate
US Steel	verdeX
Nippon Steel	NS Carbolex Neutral
JFE Steel	JGreeX
Hyundai Steel	HyECOsteel
Tata Steel Ijmuiden	Zeremis Carbon Lite
Tata Steel UK	Optemis Carbon Lite
Arvedi	Arvzero
Acciaierie d'Italia	Penisola steel
Saarstahl	Pure Steel+
SSAB	SSAB Zero
Nucor	Econiq

- A lot of steel companies have already registered special brands for supplies of "green" steel. But there is no real green steel supplies in the market.
- Multiple competing certification schemes like Low Emission Steel Standard (LESS), Responsible Steel, Global Steel Climate Council don't support decarbonization progress.
- Branding and certifications schemes don't address fundamental market barriers for decarbonization of steel industry.

High electricity prices restrain decarbonization progress

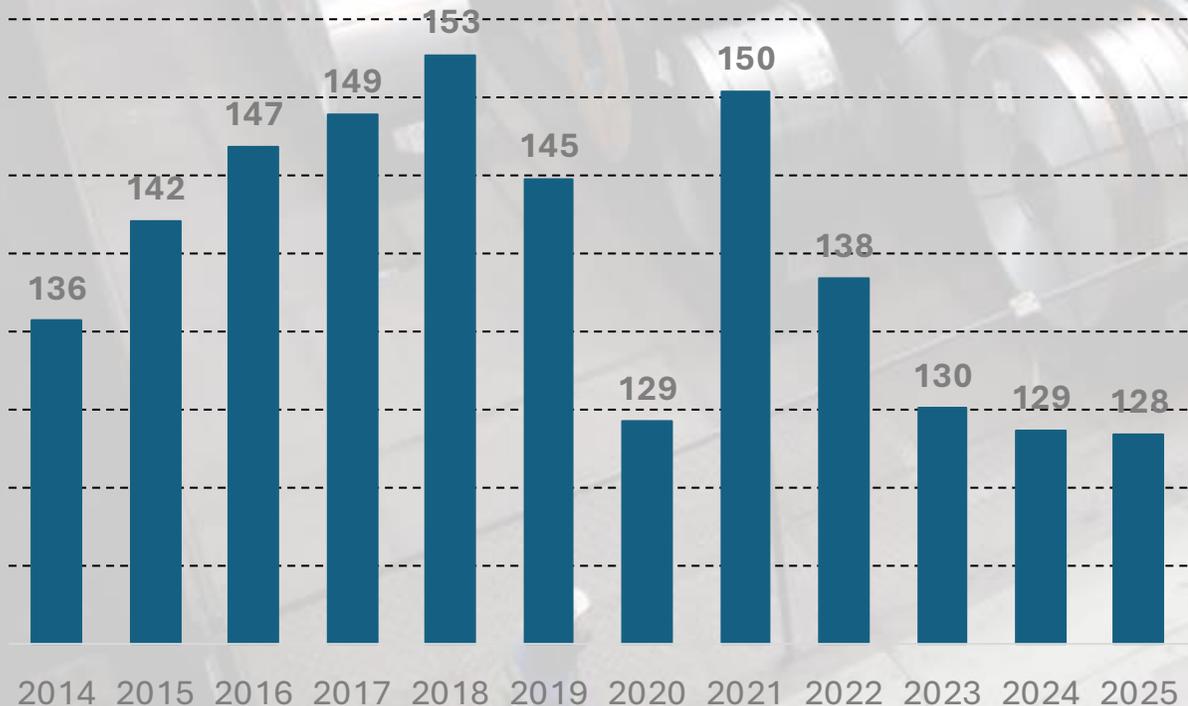


- Electricity prices above €100/MWh make green steel transition unsustainable.
- Lack of affordable low-carbon electricity blocks achievement of climate targets.
- Increasing share of renewables causes extreme price volatility: in 2022-2024, 70-90% of days per year saw intraday price swings over €50/MWh.
- The EU electricity market is fragmented. Limited cross-border interconnections raise local prices and limit availability of cheap power transmission.
- New generation capacities mainly replace old ones. We don't see such growth of generating capacities which could support increasing electricity demand.

In January 2026, average electricity prices in the EU reached €123/MWh.

Steel consumption doesn't grow in the EU

Apparent steel consumption in the EU, mln tonnes



Data source: Eurofer.

- In 2021-2025, apparent steel consumption decreased by 14.6% in the EU.
- According to GMK Center estimations, European green steel demand in 2030 may reach 20 mln t – just 15.6% of current consumption.
- Such market conditions don't create stimulus for steel producers to modernize or expand steel capacities.
- To drive decarbonization it is necessary to stimulate economic sectors consuming steel (construction, machinery, automotive).

Steel buyers don't want to pay large "green" premiums

"Green" steel premiums* in the EU

€200-300/t

asked premiums by
European EAF-based
producers

€120-180/t

average values of
premiums in 2025

- Current demand doesn't support the green premiums which EU producers ask.
- In current market conditions, decarbonization projects are not cost-effective.
- Steelmakers can't secure enough funding for decarbonization projects. Subsidies alone won't finance decarbonization.

* - These values reflect emissions limits of ≤ 0.8 tCO₂ per tonne of steel (including Scope 1, 2 and 3).

Data source: Fastmarkets.

Affordable scrap supply is essential for steel decarbonization

Additional scrap need

+8 mln tonnes of scrap supply



to increase **crude steel production in the EU** by **13-14%** in 2026

- Decarbonization leads to increasing scrap consumption.
- New EAF capacities, especially for flat/high-quality grades, will have to compete for low-residual, well-sorted scrap.
- In 2024, the EU exported **16.3 mln tonnes (Mt)** of scrap to third countries and imported **4.7 mln tonnes**. So, net export was **11.6 mln tonnes**.
- The EU is losing a double-digit Mt scrap stream to third countries each year.
- The future of European EAF-based “green” steel industry depends on possibility to ensure domestic scrap supplies at affordable prices.

Green H₂-based steelmaking isn't viable in short term

Installed capacities

2024 target **6 GWel***

June 2025 **571 MWel**

2030 target **53 GWel**

* GWel – GW of electrolysis capacities

Data source: Clean Hydrogen Monitor
2025.

- By June 2025, the EU met less than 10% of its 2024 hydrogen capacity target.
- To reach 2030 target Europe would need to more than double capacity every year until 2030. It is unrealistic in current conditions.
- In 2024, water electrolysis accounted for only 0.6% of total European hydrogen production capacity.
- The average renewable hydrogen cost was 7.1 €/kg in 2025. Industrial break-even levels are 1-3 €/kg.

Ukraine can contribute to “green” transformation of steel sector in the EU



- Ukraine is a traditional and well-known supplier of iron ore products for EU. Ukraine can also supply DR-grade iron ore pellets for DRI/HBI production.
- Metinvest and Ferrexpo have already launched production of DR-grade pellets. They also consider investment in HBI production.

For the EU, EAF route using scrap and HBI is the most feasible decarbonization solution

Projects focused on EAF transition (scrap + HBI-based)



Greenfield plant in Piombiono (2.7 mln tonnes).
Production start – 2027-2028.

voestalpine

EAF construction in Linz and Donawitz (2.5 mln tonnes).
Production start – 2027.



ArcelorMittal

EAF construction in Dunkirk (2.0 mln tonnes).
Production start – 2029.

 **MARCEGAGLIA**

EAF construction in Fos-sur-Mer (2.1 mln tonnes).
Production start – 2028.



EUROPE

EAF construction in Verona (0.5 mln tonnes).
Production start – 2027.

2 EAFs in planning stage (Belgium).

Decarbonization don't require just billion-euro projects

Potential to reduce CO₂ emissions in current production routes

- Agglomeration – by 25%
 - BF operation – by 40%
 - BOF operation – by 25%
 - EAF operation – by 25%
- Technologies decreasing carbon emissions by 5-10% matter too.
 - Scaling many “small” solutions can give more results right now than trying to push one mega project which isn't supported by market conditions.
 - It is necessary to support R&D and projects that deliver real, gradual cuts.
 - High-quality raw materials and modern equipment can cut emissions now — no need to wait for big projects.

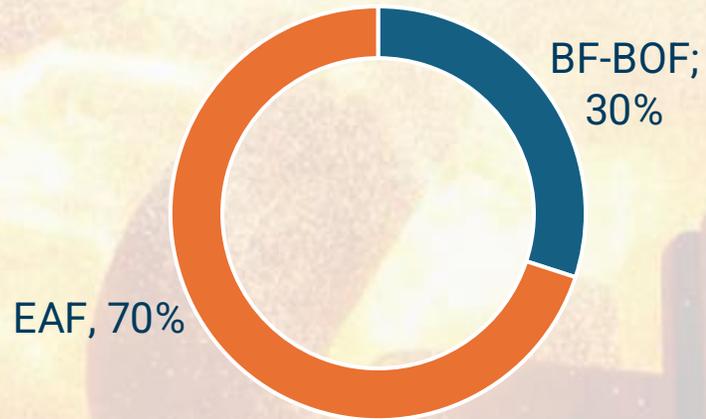
Data source: Primetals Technologies.

Global green steel progress overview



Turkiye: decarbonizing with scrap-based EAFs

Crude steel production in 2024



Carbon intensity (Scope 1), t CO₂/t steel

EAF – 0.2

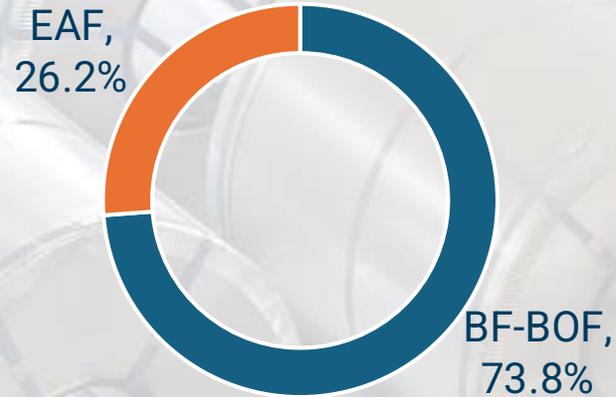
BF-BOF – 2.1

Supplier of low-carbon rebar to the EU

- Turkiye built its steel sector around EAF. In 2024, 75% of capacity was EAF-based.
- Three major BF-BOF plants (Erdemir, Isdemir, Kardemir) are the main sources of carbon emissions. They rely on own funds, focusing on construction of EAFs and increasing energy efficiency.
- Carbon intensity of Turkish steel matches EU average. Low-carbon rebar from Turkiye is already exported to the EU.

Japan: focusing on BF upgrades and CCUS

Crude steel production in 2024



Carbon intensity (Scope 1), t CO₂/t steel

EAF – 0.1

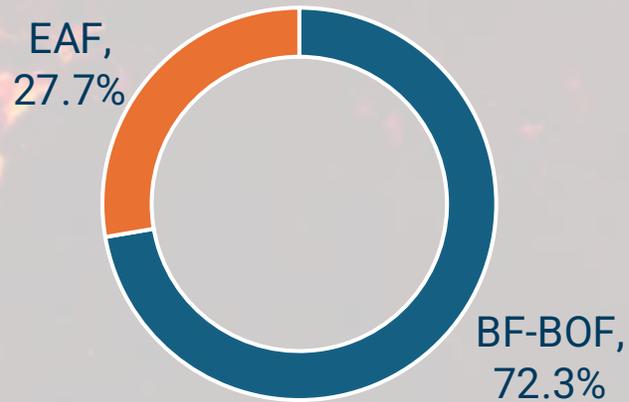
BF-BOF – 1.6

Supplier of low-carbon sheets to the EU

- Japan hasn't prioritized full EAF shift. Top steel companies aim to cut emissions from existing BF-BOF operations.
- To address residual BF emissions, Japanese steelmakers turn to CCUS.
- Due to limited domestic access to cheap renewables and green hydrogen, Japanese steelmakers plan to develop DRI projects overseas.
- Nippon Steel plans to build large-sized EAFs in Japan to process imported green HBI.
- Japan outperforms EU in steel carbon intensity. Low-carbon steel sheets are supplied to the EU.

South Korea: developing EAFs and international partnerships

Crude steel production in 2024



Carbon intensity (Scope 1), t CO₂/t steel

EAF – 0.1

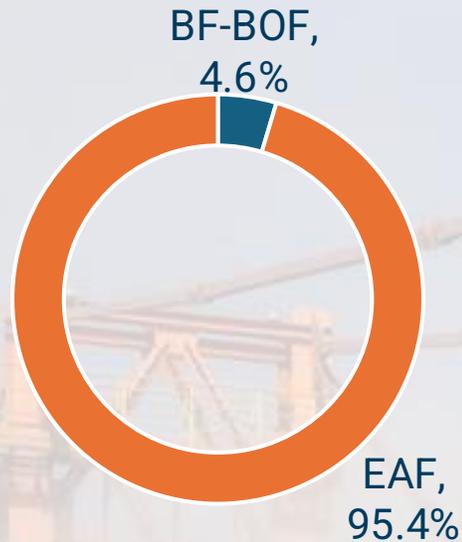
BF-BOF – 2.0

Supplier of low-carbon sheets to the EU

- POSCO plans to build two new EAFs by 2027 and shift more production to EAF over the next decade, but the shift is gradual.
- POSCO intends to supply its future EAFs with low-carbon HBI produced in Australia.
- Other Korean producers focus on EAF optimization and explore CCUS and partnerships in hydrogen production.
- Korean steelmakers have lower carbon intensity than EU average. South Korea supplies steel sheets to the EU.

MENA: transforming into global green HBI supply hub

Crude steel production in 2024 (Middle East)



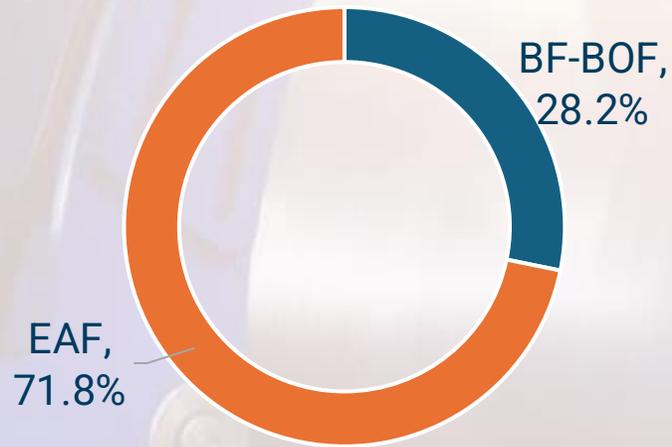
Carbon intensity (Scope 1), t CO₂/t steel

DRI-EAF – 0.8

**Supplier of low-carbon HBI, flats & longs
to the EU**

- Most MENA countries have built their steel industries around natural gas based-DRI-EAF route. Local EAF plants are integrated, with captive DRI modules.
- All announced or planned MENA steel projects avoid BF-BOF route.
- MENA has one of the world's highest solar energy potentials, which gives a unique competitive edge for producing green hydrogen and powering EAF operations.
- MENA countries see green DRI/HBI production as an export opportunity to supply low-carbon raw materials to Europe and Asia.

Crude steel production in 2024



Carbon intensity (Scope 1), t CO₂/t steel

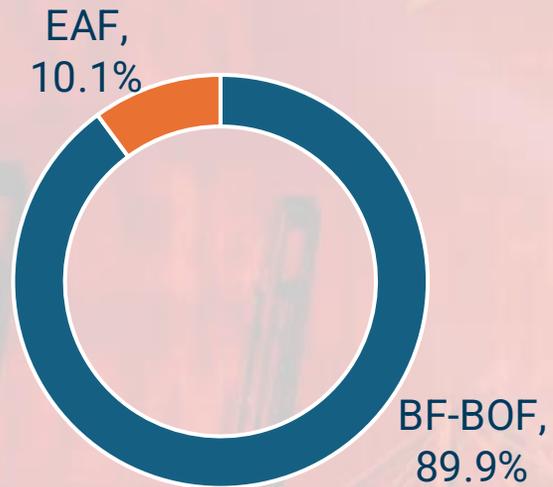
EAF – 0.3

BF-BOF – 1.6

- The US steel industry is already low-carbon. US steelmakers shifted from BF-BOF to EAF beginning in the 1980s, investing \$23 billion in EAF facilities over time.
- This transformation occurred independently of climate policy pressure, driven by market forces and scrap availability.
- The US protects its market with tariffs maintaining competitiveness of local steelmaking.

China: gradual but strategic decarbonization

Crude steel production in 2024



Carbon intensity (Scope 1), t CO₂/t steel

BF-BOF – 2.0

- No new BF-BOF in China – only EAF projects get approved.
- Scrap is added to the list of critical materials.
- Chinese steel companies invest in pilot green steel projects. HBIS runs H₂-DRI-EAF plant (600 ths t/year), with plans to double to 1.2 mln t/year.
- In 2024, 35 green hydrogen projects launched with 48 ths tonnes/year of capacity.

Conclusions: key policies for European steel decarbonization

1. **Stimulate steel demand**
2. **Protect market from excess imports**
3. **Ensure affordable prices of low-carbon electricity**
4. **Secure metallics supply**
5. **Support R&D and projects cutting carbon emission**

MEDIA

Free data source about iron&steel:

- ◆ up-to-date market analytics
- ◆ corporate news
- ◆ full picture of global iron&steel industry
- ◆ interviews and opinions of market leaders
- ◆ steel and raw material prices

THINK TANK

Think tank:

- ◆ fundamental studies on key challenges for iron&steel industry
- ◆ new ideas for decision making, public and expert discussion
- ◆ support of the dialogue between steel market stakeholders

RESEARCH AGENCY

Market studies:

- ◆ global steel markets coverage
- ◆ scrap market
- ◆ DRI/HBI and DR-grade feed
- ◆ CBAM/ETS/carbon prices impact
- ◆ macroeconomic modelling
- ◆ prices forecast



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