CLIMATE ANALYTICS

Decarbonising iron and steel in Albania, Bosnia and Herzegovina and Serbia

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About Climate Analytics

Climate Analytics is a global climate science and policy institute. Our mission is to deliver cutting-edge science, analysis and support to accelerate climate action and keep warming below 1.5°C.

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Summary

As fundamental building blocks of the modern world, iron and steel are key commodities with growing demand driven by population and economic growth globally. The industry presents a critical challenge to mitigating global greenhouse gas emissions, with the worldwide annual production of nearly 2 billion tons of steel directly producing roughly 7% of total GHG emissions, excluding emissions from coking coal and fugitive methane emissions. Improvements in energy efficiency and the introduction of new technologies has brought down the overall carbon intensity of the iron and steel industry slightly, with energy and emissions intensity reaching very close to theoretical limits in developed countries.

However, in the past ten years, total emissions from the iron and steel sector have grown, largely driven by increases in demand. Carbon Capture and Storage (CCS) has been a feature of future plans for the global iron and steel sector but remains technologically immature and economically infeasible and is unlikely to significantly contribute to the decarbonisation of the sector. Emissions reductions in the sector should be primarily achieved by reducing process and energy emissions and improving efficiency.

Successful decarbonisation of the iron and steel sector requires a comprehensive approach, addressing both the demand and supply side. Decarbonisation should be driven by both the private sector and public regulation, resulting in a fundamental reorientation of the global iron and steel supply chain. The European Union's Carbon Border Adjustment Mechanism (CBAM) is a critical part of this push to decarbonise industry – when combined with domestic carbon prices it can support decarbonisation and limit carbon leakages while complying with global free trade regulations.

Albania, Bosnia and Herzegovina and Serbia all export iron and steel goods to the EU. In order to continue to stay economically competitive and align with their climate goals, these countries will need to decarbonise the sector as they are covered by the CBAM. Producers in Bosnia and Herzegovina and Serbia are expected to be significantly impacted by CBAM due to the high emissions intensity of steel production and high emissions intensity of the electricity grid. Producers in Albania may be well positioned for a pivot to green steel, with the high share of hydropower supporting low grid emissions intensity and buffering energy-intensive sectors.

Technical pathways to decarbonised steel in the region in the near-term include pivoting production to using electric arc furnace (EAF) with either DRI or scrap as feedstocks, and integrating on-site renewables. Reducing the energy intensity of the electricity grid is a critical step to support full decarbonisation. In addition to pivoting to EAF-based production processes supported by renewables, integration of green hydrogen-based approaches in Western Balkan steelmaking may be economically feasible in the future.

Stakeholders are broadly aware of the need to decarbonise but often cite a need for further policy development and resourcing to transition to lower-carbon modes of production. A fundamental policy step to support decarbonisation in the steel sector is establishing a carbon price and integrating the sector into this program. Further policy steps include improving industry access to green finance, reforming permitting for on-site renewables, green public procurement, workforce capacity building, and implementing monitoring, reporting, verification and accreditation (MRVA) programmes. Longer-term interventions – including developing strong transition plans for the industry and demand reduction and circular economy measures – can support the reorientation of Western Balkan steel supply chains towards a low carbon, competitive future.

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Introduction

The global iron and steel industry is responsible for 7% of total annual GHG emissions, excluding emissions from coking coal and fugitive methane emissions. Decarbonisation of iron- and steelmaking is a critical step to achieving national emission reduction targets and aligning with the Paris Agreement's goal of limiting warming to 1.5ºC. While the steel sector is often described as 'hard-to-abate' due to the technical and process challenges in reducing emissions, this label is a misnomer. There are accessible and achievable routes to decarbonisation that address both supply and demand – using existing and emerging technologies and supported by robust policy frameworks.[1]

The European Union's Carbon Border Adjustment Mechanism (CBAM) is a fundamental shift for exporters of iron and steel to the EU market. The mechanism is designed to level the playing field between domestic producers of iron and steel, who are subject to the EU Emissions Trading System (ETS), and international producers in less stringent jurisdictions. The CBAM raises the cost of carbon-intensive imports by placing a tax on the embedded carbon of a traded good. The CBAM shifts the financial calculus for importers, where high-carbon products become relatively more expensive and lower-carbon products become relatively less expensive. When the CBAM is fully implemented in 2026, producers of lower carbon products will see a relative advantage.

Albania, Bosnia and Herzegovina (BIH) and Serbia all export iron and steel products to the EU but are expected to face varying impacts as a result of their different emission intensities of production. This paper is part of a series assessing decarbonisation options for CBAM-covered sectors in Albania, BIH and Serbia (also including **electricity, cement**, and **chemicals**) to support domestic industry maintaining competitiveness and contribute to national emissions reductions in alignment with the Paris Agreement.[2] We first overview the current state of steel production, examine emerging technologies and look at the fundamental challenges to decarbonising the sector. We evaluate the state of the sector in these three countries and present a number of strategies to shift the market towards green steel based on desk research and interviews with industry stakeholders in the target countries.

[1] Climate Analytics, *Hard-to-Abate: A Justification for Delay?* (2025), https://climateanalytics.org/publications/hard-to-abate-a-justification-for-delay.
[2] Climate Analytics (2025). https://climateanalytics.org/publications/decarbonising-electricity-cement-iron-and-steel-and-chemicals-in-albania-bosnia-and-herzegovina-and-serbia

The state of steel

The essential chemistry behind iron and steelmaking has not changed for over 2000 years. Iron ore is composed of iron and oxygen, producing iron oxide. Iron oxide needs to be reduced to metallic iron. This process, where iron ore is used to make steel is primary steelmaking, and accounts for roughly 70% of total global steel production.[3] The most commonly used reactor for primary steel production is the blast furnace. In a blast furnace, CO produced from the partial combustion of coke (produced from coking coal gasification) reacts with iron oxide to produce metallic iron and CO_2. The reaction occurs above the melting temperature of iron, which allows the removal of impurities (slag).

Primary steel production relies heavily on raw materials and fossil fuels

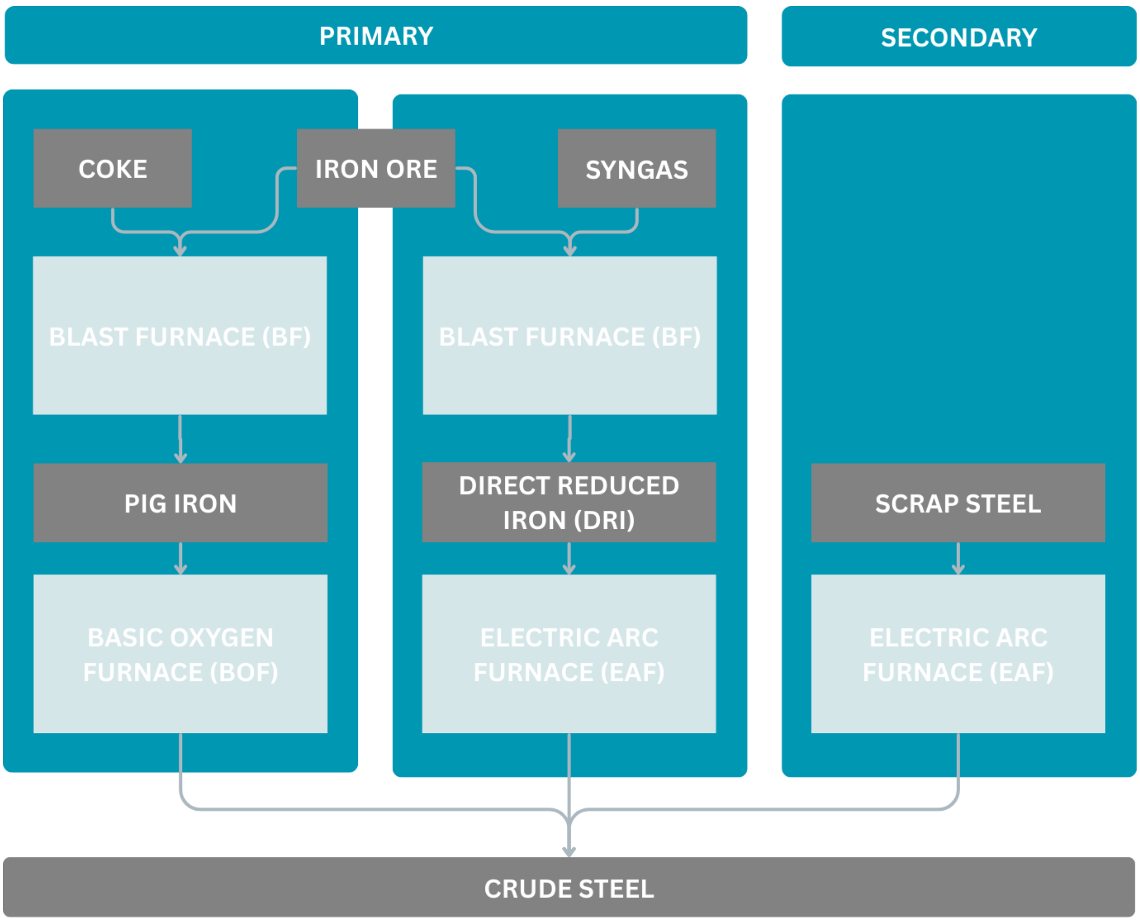

Figure 1: Basic steel production routes, adapted from Somers (2022)

[3] Global Energy Monitor, "Global Iron and Steel Tracker," *Global Energy Monitor*, July 18, 2024, https://globalenergymonitor.org/projects/global-iron-and-steel-tracker/.

Primary steel production is dominated by the **blast furnace-basic oxygen furnace (BF-BOF)** process. BF-BOF production accounts for roughly 70% of total steel production (see *Figure 1*). This process produces significant emissions – the global average CO_2 emissions intensity per tonne of crude steel in 2023 was estimated to be between 1.4-1.92 tCO2/t,[4] for BF-BOF processes this value was 2.33 tCO2/t (see *Figure 2*).[5] Ironmaking produces a majority of the CO_2 emissions in the primary steelmaking process.[6] The coke produced from coking coal and fossil gas are also a significant source of methane emissions, accounting for roughly 30% of the overall emissions of the steel and iron industry.[7] BF-BOF production is also one of the most energy intensive forms of steel production, requiring roughly 24 GJ/t steel in 2023.

Secondary steel production relies primarily on electrified processes, where natural gas and electricity are the main energy inputs into the **Electric Arc Furnaces (EAFs)** which can utilise scrap as a feedstock. Roughly 33% of total global steel is produced using EAF.[8] EAF processes are inherently less carbon intensive than BF-BOF routes and are the most direct way for the industry to pivot to electrification. As with the BF-BOF route, carbon emissions from EAF are highly variable.[9] The **scrap-EAF** route, which uses recycled steel as its main input, can produce steel at a rate of 0.2-0.5 tCO2/t crude steel depending on the relative efficiency and emissions intensity of electricity.[10] However, the carbon required to fine-tune the chemistry of the steel scrap and fossil fuels often

[4] Estimated emissions from iron and steelmaking are uncertain and can vary from plant to plant and based on data collection and methodological approaches. The World Steel Association estimates a global average 1.92 tCO2/t crude steel and the IEA estimates around 1.4 tCO2/t. Estimates from other sources are as high as 2.5-3.0 tCO2/t in specific regions.
[5] World Steel Association, *Sustainability Indicators 2024 Report* (Brussels, 2024), https://worldsteel.org/wider-sustainability/sustainability-indicators/.
[6] Julian Somers, *Technologies to Decarbonise the EU Steel Industry*, EUR 30982 EN (Publications Office of the European Union, 2022), https://publications.jrc.ec.europa.eu/repository/handle/JRC127468.
[7] Ember, *The EU's Steel Industry and Its Methane Problem*, 2025, https://ember-energy.org/latest-insights/the-eus-steel-industry-and-its-methane-problem; Amaury M. Souza et al., "How Upstream Methane Emissions Can Impact Cost and Emissions of Steelmaking Routes?," *Journal of Materials Research and Technology* 24 (May 2023): 7153–61, https://doi.org/10.1016/j.jmrt.2023.04.238.
[8] Global Energy Monitor, "Global Iron and Steel Tracker."
[9] Zhiyuan Fan and S. Julio Friedmann, "Low-Carbon Production of Iron and Steel: Technology Options, Economic Assessment, and Policy," *Joule* 5, no. 4 (2021): 829–62, https://doi.org/10.1016/j.joule.2021.02.018.
[10] Fan and Friedmann, "Low-Carbon Production of Iron and Steel."

used to power furnaces to reheat steel for rolling following production in an EAF lead to some embedded carbon emissions.[11]

Ironmaking is the main source of emissions in the steel production process, but emissions occur at multiple points.

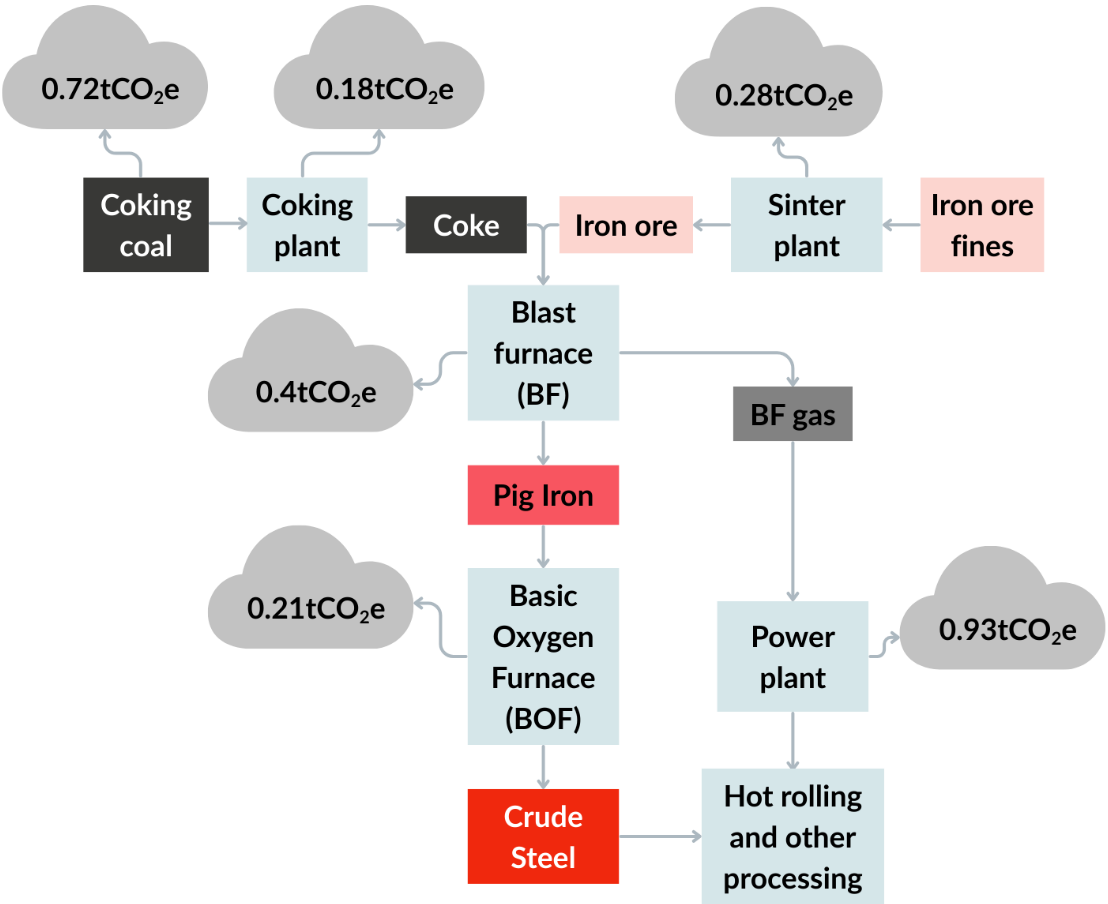

Figure 2: Primary iron and steelmaking emissions by step. Based on Agora (2024) reproduced under license CC BY 4.0.

Scrap-EAF is subject to supply limitations, unlike the primary route, due to its high dependency on scrap steel as a feedstock, which also may limit the quality of the end product.[12] However, trials of a "car to car" recycling program with Tokyo Steel and Toyota motors seems to have overcome the quality challenge and could act as an

[11] Derck Koolen and Danko Vidovic, *Greenhouse Gas Intensities of the EU Steel Industry and Its Trading Partners*, JRC Technical Report EUR 31112 EN (Publications Office of the European Union, 2022), https://op.europa.eu/en/publication-detail/-/publication/b70de3e7-fda3-11ec-b94a-01aa75ed71a1/language-en.
[12] Wanho Kim and Il Sohn, "Critical Challenges Facing Low Carbon Steelmaking Technology Using Hydrogen Direct Reduced Iron," *Joule* 6, no. 10 (2022): 2228–32, https://doi.org/10.1016/j.joule.2022.08.010.

example for other producers. Tokyo Steel altered its scrap-EAF production to use only scrap metal from recycled vehicles, resulting in automotive-quality steel at about one-fifth of the emissions of the BF-BOF route.[13] In addition to process and technology improvements, there are several policy steps that can help address these limitations (below), but the secondary route is fundamentally limited by the rate at which steel products reach the end of their lifetime.[14]

The **DRI-EAF** route which uses direct reduced iron (DRI) using fossil gas can produce steel at an emission intensity of 1.4-1.5 tCO2/t.[15] Direct iron reduction (DRI) is a process that reduces iron ore to iron in the solid state using reduction gases made of CO and H_2. Direct-reduced iron is then used as a feedstock for EAFs. Commercialised DRI operations tend to use vertical shaft furnace reactors, which use fossil gas to reduce higher-grade iron ore pellets and emits between 30-60% less CO_2 than BF-BOF iron production. India is the largest global producer of DRI, but does not typically use fossil gas, instead using coal-based DRI (produced in horizontal rotary kilns similar to the cement kilns). DRI production in coal-based rotary kilns is the most CO_2-intensive ironmaking process globally.

However, the high-grade iron ore pellets DRI relies on could prove to be a critical bottleneck in the expansion of DRI-EAF based production. DRI-grade pellets represent a small share of the total iron ore market and supply is projected to be limited.[16] Alternate routes could use an electric smelting furnace (ESF), which allows the use of BF grade pellets. The ESF allows for removal of impurities.

Approaches that utilise hydrogen (H_2) are being trialled extensively, with testing for market-readiness happening internationally. While the processes are colour-agnostic, effective decarbonisation of the steel value chain will require a significant amount of renewable energy and green hydrogen. This means greening steel necessitates a significant investment into green hydrogen, potentially re-orienting the hydrogen and

[13] Joanne Ju, "Tokyo Steel Supplies Low-Carbon Hot-Rolled Sheet to Toyota," S&P Global Commodity Insights, November 12, 2025, https://www.spglobal.com/commodity-insights/en/news-research/latest-news/metals/111225-tokyo-steel-supplies-low-carbon-hot-rolled-sheet-to-toyota.
[14] Julien Armijo, *Decarbonising Steel Production - Is Hydrogen the Only Lever?* (Zenon Research, 2025), https://www.zenon.ngo/en/insights/decarbonizing-steel-production.
[15] IEEFA, *The Facts about Steelmaking*, Fact Sheet (Institute for Energy Economics and Financial Analysis, 2022), https://ieefa.org/sites/default/files/2022-06/steel-fact-sheet.pdf.
[16] Agora Industry et al., *Low-Carbon Technologies for the Global Steel Transformation* (2024), https://www.agora-industry.org/publications/low-carbon-technologies-for-the-global-steel-transformation.

steel value chains around areas where renewable hydrogen can be produced economically.[17]

Challenges to decarbonising steel

Benchmarking green steel

Steel comes in a dizzying array of product types and grades with a wide range of carbon content – even when produced using the same route. Many products are marketed with a range of terminologies implying a certain level of decarbonisation from 'fossil free steel' to 'carbon neutral steel' to 'net zero steel'. Several voluntary international sustainability standards exist, establishing thresholds for classifying steel according to its emissions intensity. Further corporate, regional and national level standards add additional complexity to the situation and make it challenging to effectively evaluate the 'green-ness' of a steel product.

In this report, we use the IEA's 'near zero steel' (NZS) definitions as a reference point for green steel:

- for primary steel from 100% iron, generating 400 $kgCO_2e/t$
- for secondary steel from 100% scrap, generating 50 $kgCO_2e/t$[18]

Other organisations have developed definitions of near-zero emissions steel or similar. Some of these are presented in Annex 1.[19]

The EU's total carbon emissions intensity of iron and steel is estimated at roughly 1.15tCO_2/t, whereas the total carbon emissions intensity of iron and steel in Serbia is estimated at 2.11 tCO2/t, significantly higher than the EU.[20]

Residual emissions and CCS

As discussed above, there are significant opportunities to reduce emissions from iron and steelmaking – particularly in replacing energy intensive processes with renewable

[17] Soroush Basirat, *Hydrogen Unleashed: Opportunities and Challenges in the Evolving H2-DRI-EAF Pathway beyond 2024* (Institute for Energy Economics and Financial Analysis, 2024), https://ieefa.org/resources/hydrogen-unleashed-opportunities-and-challenges-evolving-h2-dri-eaf-pathway-beyond-2024.
[18] IEA, "Definitions for Near-Zero and Low-Emissions Steel and Cement, and Underlying Emissions Measurement Methodologies," IEA, November 8, 2024, https://www.iea.org/reports/definitions-for-near-zero-and-low-emissions-steel-and-cement-and-underlying-emissions-measurement-methodologies.

[20] Koolen and Vidovic, *Greenhouse Gas Intensities of the EU Steel Industry and Its Trading Partners*.

electricity and green hydrogen (see the electricity paper in this series for further details on decarbonising electricity). However, residual emissions from the steel production process continue to exist that cannot be fully addressed through carbon capture technologies. In the case of BOF routes, a small amount of carbon is required for furnace operation, and in EAF routes, carbon is produced in the EAF and smelter due to materials consumption.[21]

Retrofitting BF-BOF plants with Carbon Capture and Storage (CCS) or Carbon Capture Use and Storage (CCUS) systems is often touted as a key step to decarbonising the sector. However, CCS technologies are unproven at scale in the steel industry and are unlikely to be a key driver of decarbonisation in iron and steel. Across sectors, CCS tends to underperform, with research suggesting it would struggle to capture more than 50% of facility emissions due to the numerous sources of CO_2 in typical BF-BOF plants.[22] This is partly due to the fact that CCS units would only be installed on the main sources of CO_2 emissions (coking plants, onsite power plants and the blast furnace), not capturing emissions from other points which are not economically feasible to add CCS to – like sintering or other gas exhausts with lower levels of CO_2 concentration (see *Figure 2*).[23]

Even when existing BF-BOF plants are successfully retrofitted, in order to make the economics work, captured CO_2 is often then primarily used for enhanced oil recovery (EOR).[24] Enabling further extraction of fossil fuels cannot be regarded as a decarbonisation solution.[25] There are several operational CCUS projects in the iron and steel industry globally. The Emirates Steel Arkan DRI-EAF in Abu Dhabi has an announced CO_2 capture capacity of 800 ktCO_2/year. Despite limited public performance data, the facility is estimated to capture less than 20% of total Scope 1 and Scope 2 emissions.[26] What CO_2 is captured, is then used for EOR. In 2021, Tata Steel in India established a CCS facility with a capacity of 5 tCO_2/day.[27] The ArcelorMittal BF facility in Belgium began a pilot CCS project in 2024, intending to capture 300 kgCO_2/day.

[21] Agora Industry et al., *Low-Carbon Technologies for the Global Steel Transformation*.
[22] Climate Analytics, *Hard-to-Abate: A Justification for Delay?*
[23] Agora Industry et al., *Low-Carbon Technologies for the Global Steel Transformation*.
[24] Simon Nicholas and Soroush Basirat, *Carbon Capture for Steel?* (Institute for Energy Economics and Financial Analysis, 2024), https://ieefa.org/resources/carbon-capture-steel.
[25] Nicholas and Basirat, *Carbon Capture for Steel?*
[26] IEEFA, "CCUS for Steelmaking Rapidly Losing Its Lustre," 2024, https://ieefa.org/articles/ccus-steelmaking-rapidly-losing-its-lustre.
[27] Tata Steel, "Tata Steel Commissions India's First Plant for CO2 Capture from Blast Furnace Gas at Jamshedpur," 2021, http://www.tatasteel.com/media/newsroom/press-

At the same time, even if BF-BOF facilities can be equipped with cost-effective CCUS units, fugitive methane emissions from coal mining for coke would remain a significant and unaddressed challenge. Future projections for announced CCS projects show only a sliver of CCS development happening in the iron and steel sector – the World Steel Association finds that CCS will be unlikely to contribute significantly to decarbonisation in the industry now or in the future.[28]

Cost of energy and abatement technologies

While the scrap-EAF and DRI-EAF pathways are mature and compete in the market, abatement of emissions entails higher costs than the conventional BF-BOF process.[29] At the same time, conventional steel prices are slumping due to market distortion from subsidies and excess capacity, and profitability is decreasing. Currently in the EU, estimated green steel production costs are an additional 100-150 EUR per tonne. While a small share of consumers have shown willingness to pay a 'green premium' for less carbon intensive steel products, carbon pricing must work to level the playing field.[30] In the EU, the competitiveness of green steel is highly dependent on the evolution of the ETS and CBAM. With effective carbon pricing, estimates show that lower carbon primary and secondary steel production can become a competitive option.[31]

Increased integration of electricity also makes the cost of electricity a much more significant variable, both for direct costs and carbon accounting. This is a particular challenge in the Western Balkans, where households and firms receive electricity at artificially low prices, placing significant stress on public finances and artificially propping up the region's highly carbon-intensive electricity sector.[32] Electricity market reform in the Western Balkans is becoming a fiscal necessity. It is a requirement of further integration with the EU and will play a critical role in the balance sheets of iron and steel firms across the region.

releases/india/2021/tata-steel-commissions-india-s-first-plant-for-co2-capture-from-blast-furnace-gas-at-jamshedpur/.

[28] IEA, "CCUS Projects Database," 2025, https://www.iea.org/data-and-statistics/data-product/ccus-projects-database; Nicholas and Basirat, *Carbon Capture for Steel?*

[29] Xinyi Wu et al., "Technological Pathways for Cost-Effective Steel Decarbonization," *Nature* 647, no. 8088 (2025): 93–101, https://doi.org/10.1038/s41586-025-09658-9.

[30] Ulf Narloch, "How Carbon Prices Reshape the Economics of Steel," *Green Steel World*, July 22, 2025, https://greensteelworld.com/how-carbon-prices-reshape-the-economics-of-steel.

[31] Julia Attwood, "The Cost of Decarbonizing Industry Is High, But Within Reach," *BloombergNEF*, July 24, 2024, https://about.bnef.com/insights/industry-and-buildings/the-cost-of-decarbonizing-industry-is-high-but-within-reach/.

[32] OECD, *Energy Prices and Subsidies in the Western Balkans: Reforms for a Fair and Green Future, OECD Development Pathways* (OECD Publishing, 2025), https://doi.org/10.1787/082ea26a-en.

Iron and steel in the Western Balkans

Albania

Albania exported roughly EUR267 million worth of iron and steel products in 2024 – of which roughly EUR75 million was to the EU. While the production of steel products has declined, the EU remains a significant market for Albanian products. a Albania is projected to have a strategic advantage when CBAM is implemented as Albanian products will become relatively cheaper compared to its neighbours due to lower levels of embedded carbon.[33]

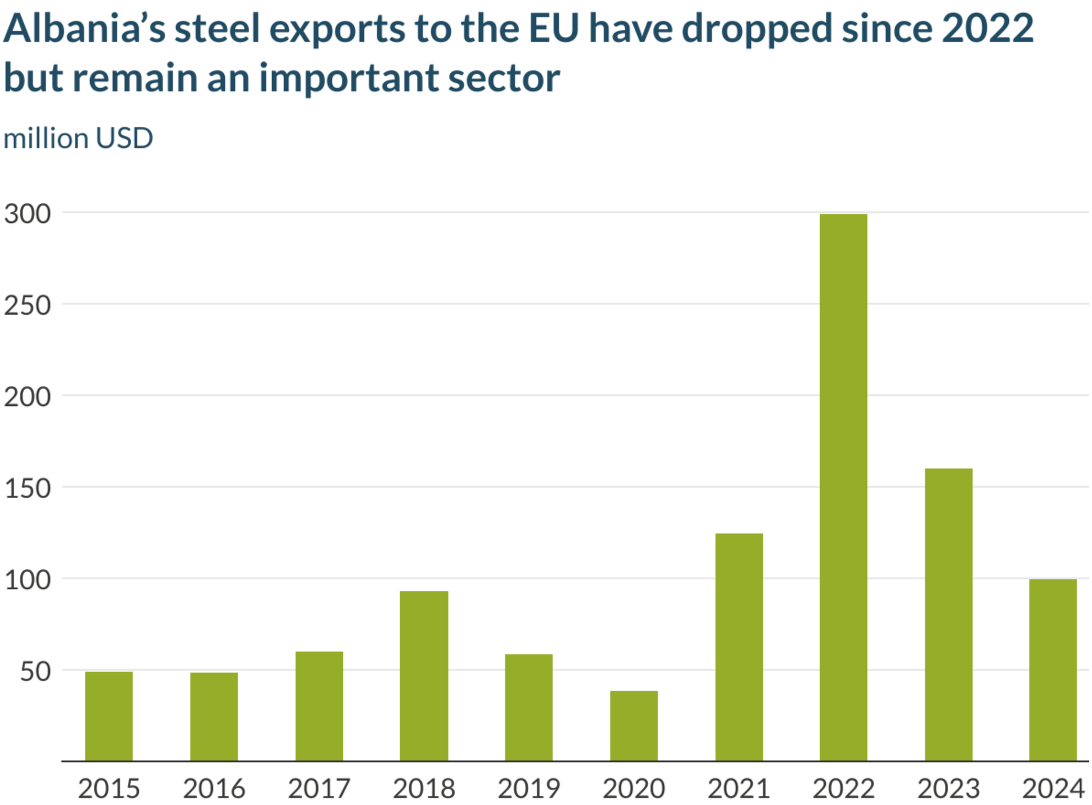

Figure 3: Albania's steel exports to the EU (million USD). Data from the UN Comtrade Database

[33] World Bank Group, *Albania Country Compendium*, Country Climate and Development Report, WESTERN BALKANS 6. (2024), https://openknowledge.worldbank.org/server/api/core/bitstreams/5a7fd970-4855-4ec0-8423-152cf0656ea8/content.

The Kurum International Elbasan steel plant is Albania's only major operational iron and steel complex, with an annual capacity of 700,000 tonnes and 60% of its products sold internationally at peak production levels. Since renovations in 2010, it primarily used scrap as a feedstock – with at least one EAF unit powered with on-site hydropower generation.[34] The Kurum steel plant has experienced some financial and legal difficulty, temporarily pausing production after significant financial issues in 2015 and facing charges of illegally exporting toxic waste in recent years.[35] While production resumed until 2024, as of November 2025, Kurum steel paused operations citing maintenance concerns while also facing charges of illegally exporting toxic waste.[36] While Kurum reports emissions data, details about emissions are not publicly available, and emissions are likely calculated with an estimation methodology rather than directly measured. Smaller firms specialised in production or finishing of specific steel products continue to operate but are reliant on imports of pig iron.

Estimates of Albania's overall iron and steel emissions intensity sit at around 1.2 kgCO_2/USD of product produced, roughly in-line with the EU's iron and steel emissions intensity.[37] In the context of the CBAM, Albania's steel exports to the EU would likely remain cost-competitive in the European market, having a similar carbon content to steel products made in the EU. Albania's high share of hydropower in electricity and lower overall emissions intensity of electricity means that successful adaptation to the CBAM will likely have to focus on process changes in iron and steel production supported by policy development that cultivates further decarbonisation.

[34] Global Energy Monitor, "Global Iron and Steel Tracker."
[35] EuroNews Albania, "Scandal with Hazardous Waste, Economic Crime 'Lands' in Kurum," 2024, https://euronews.al/en/scandal-with-hazardous-waste-economic-crime-lands-in-kurum/.
[36] Tirana Times, *Kurum Steelmaker, One of Albania's Biggest Investors, Files for Bankruptcy*, Business & Economy, 2025, https://www.tiranatimes.com/kurum-steelmaker-one-of-albanias-biggest-investors-files-for-bankruptcy/.
[37] World Bank Group, *Albania Country Compendium*.

Bosnia and Herzegovina

The steel and iron industry plays a key role in the economic development of Bosnia and Herzegovina. In 2024, Bosnia and Herzegovina's iron and steel export value was EUR197 million, with total production in 2024 at roughly 800,000 tpa.[38] While Bosnia and Herzegovina remains a net importer of steel products, EU member states remain key trading partners.[39]

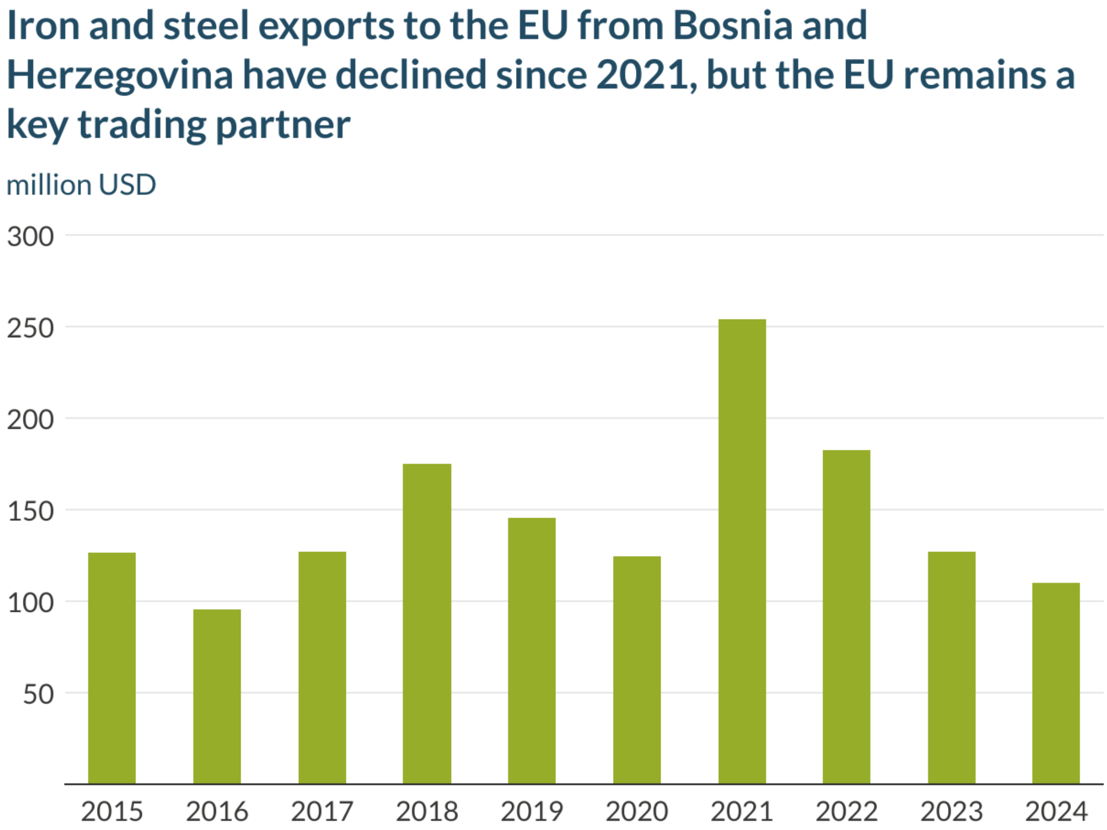

Figure 4: Bosnia and Herzegovina's exports of iron and steel products to the EU (million USD). Data from UN Comtrade Database.

Bosnia and Herzegovina has one major steel plant, supported by domestic mining and coking industries. Owned by ArcelorMittal until mid-2025, when it was sold to Bosnian

[38] Agency for Statistics of Bosnia and Herzegovina, *Robna Razmjena BiH s Inozemstvom 2024. [Trade Exchange for Bosnia and Herzegovina 2024]* (2025), https://bhas.gov.ba/data/Publikacije/Bilteni/2025/ETR_00_2024_TB_1_HR.pdf; Global Energy Monitor, "ArcelorMittal Zenica Steel Plant," Global Iron And Steel Tracker, https://www.gem.wiki/ArcelorMittal_Zenica_steel_plant.
[39] Observatory of Economic Complexity, "Bosnia and Herzegovina (BIH) Exports, Imports, and Trade Partners," 2025, https://oec.world/en/profile/country/bih.

firm Pavgord Group, the steel plant in Zenica operates multiple production pathways, including traditional BF-BOF and scrap-EAF.[40] It has a nominal iron production capacity of 1.1 mtpa and nominal crude steel capacity of 1.9 mtpa. Over the last five years it has produced between 600-800,000 tpa of crude steel – although the plant has not produced crude steel using its EAF in several years. The plant is primarily powered by a thermal power plant that was previously run on coal. However following renovations 2021, it uses fossil gas and waste gasses from the blast furnaces.[41] Renovations of the blast furnace in 2018 extended its lifetime to 2038.[42]

Steel production in Bosnia and Herzegovina faces challenges, especially in the context of global efforts to reduce GHG emissions. This sector plays a key role in the domestic economy, but if it does not adapt to the new standards, it could lose about 0.7% of its potential value in the first year of CBAM implementation period.[43] In the event of full CBAM rate calculation and reduction of free emission allocations in the EU ETS, the lost value would amount to 27.55%. The problems are further complicated by outdated technologies used in steel production, which make it difficult to modernise and comply with environmental standards – especially with increased production costs under CBAM. This change could have a serious impact on the competitiveness of the products on the European Union market. Countries that fail to meet the environmental criteria risk losing access to this market, which could lead to trade flows being diverted.

To adapt to the new challenges, steel producers in Bosnia and Herzegovina need to invest in new technologies and more efficient processes (green hydrogen, electric furnaces powered by renewables, and carbon capture technologies). This modernisation would not only allow them to remain competitive, but would also contribute to reducing CO_2 emissions, thereby meeting the new EU standards. It would, nevertheless, necessitate high investment costs. Recycling steel, modernising production, and investing in solar and wind energy can cut emissions and reduce dependence on fossil fuels. Large companies can transition to renewables more easily, while SMEs face higher transition barriers due to lack of capacity and access to capital.

[40] Global Energy Monitor, "ArcelorMittal Zenica Steel Plant."
[41] Vladimir Spasić, "Zenica Inaugurates Heating Plant Fueled by Waste Gases," *Balkan Green Energy News*, March 25, 2022, https://balkangreenenergynews.com/zenica-inaugurates-heating-plant-fueled-by-waste-gases/.
[42] Global Energy Monitor, "ArcelorMittal Zenica Steel Plant."
[43] Calculation based on current cost of CBAM certificate, value of steel exports in 2024, current price of steel per tonne and the 2.5% reduction of EU free emission allowances (where 97.5% is the CBAM factor added to ETS calculations for 2026).

Serbia

The main export market for Serbia's iron and steel industry is the European Union. Between 2019 and 2023, on average, 70% of the sector's export value was directed to the EU market, with the annual export amount reaching approximately one billion euros.

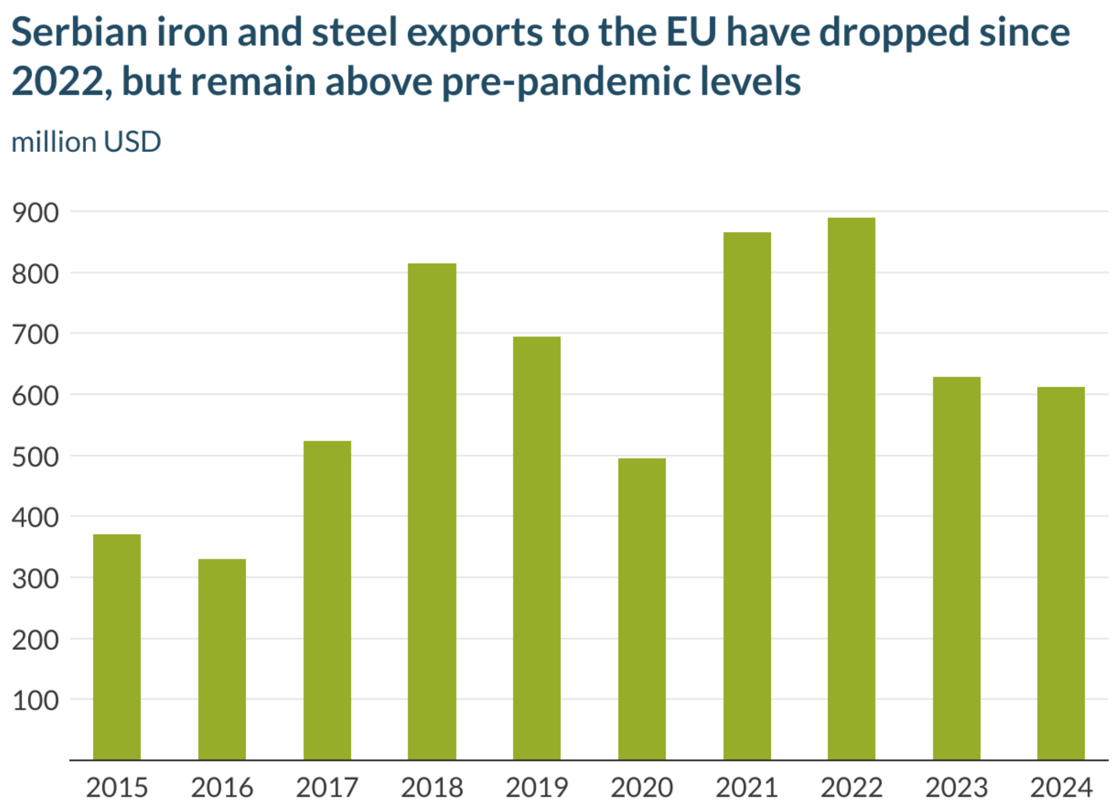

Figure 5: Serbia's iron and steel exports to the EU. Data from the UN Comtrade Database.

Around 60% of Serbia's total exports are expected to be directly affected by the CBAM. In the iron and steel sector, around 90% of exports to the EU are covered by CBAM. In 2023, the value of CBAM-regulated iron and steel exports to the EU amounted to EUR 925 million,[44] while in 2024, Serbia exported roughly EUR 556 million worth of iron and steel products to the EU, representing a 9.5% decrease compared to the previous

[44] A Vicentijevic et al., *Assessing Serbian Iron and Steel Exports to the EU under CBAM* (Faculty of Organizational Sciences, University of Belgrade, 2024), https://rfos.fon.bg.ac.rs/bitstream/handle/123456789/2831/bitstream_4143.pdf.

year.[45] According to the World Steel Association, crude steel production in Serbia in 2023 was approximately 1.4 million tonnes.[46]

From 2012 to 2022, emissions in the industry continuously increased as production grew (with the exception of 2020 due to the COVID-19 pandemic) reaching a 63% emissions increase in 2022 compared to 1990 levels. However, in 2023 emissions decreased 14% compared to the previous year, due to a partial stabilisation of the sector and other economic and industrial dynamics.[47] The total carbon emissions intensity of iron and steel in Serbia is estimated at 2.11 tCO_2/t for 2018, significantly higher than the EU, which was at 1.15tCO_2/t in the same year.[48]

HBIS Group Serbia, part of the Chinese company HeSteel Group, is the largest producer and exporter in Serbia's steel industry. The company acquired the steel plant in Smederevo in April 2016 for EUR 46 million, becoming a central player in the sector and an important export partner to the EU market.[49] The Smederevo steel plant has one mothballed and one operational blast furnace, and three BOF units. It utilises both primary iron ore and scrap in its iron and steel production.[50] Serbia's other major steel producer, Metalfer, runs entirely scrap-EAF, with a capacity of 500 ttpa.[51] With a grant from the EBRD, Metalfer integrated 4 MW of rooftop solar in addition to the renewable energy it purchases from the power utility.[52] Metalfer has additional plans to integrate a

[45] Valentina Bajic, "Serbia Seeks Exemption from EU's Proposed Steel Tariffs, Quotas," See News, October 15, 2025, https://seenews.com/news/serbia-seeks-exemption-from-eus-proposed-steel-tariffs-quotas-1283337.
[46] Bajic, "Serbia Seeks Exemption from EU's Proposed Steel Tariffs, Quotas."
[47] Republic of Serbia Ministry of Environmental Protection, *National Greenhouse Gas Inventory Report of Serbia 2025* (Ministry of Environmental Protection, Environmental Protection Agency, 2025), https://unfccc.int/sites/default/files/resource/NID_Serbia_2025_March_31th.pdf.

[48] Koolen and Vidovic, *Greenhouse Gas Intensities of the EU Steel Industry and Its Trading Partners*.

[49] "Serbian Govt, Chinese Company Sign Deal on Sale of Smederevo Steel Mill," China Daily, 2016, https://www.chinadaily.com.cn/bizchina/2016-04/19/content_24663026.htm.
[50] HBIS GROUP Serbia Iron & Steel llc, *General Information on Plant Facilities* (Belgrade, 2020), https://hbisserbia.rs/wp-content/uploads/Brosura%20General%20Info%2021%2010%202020%20ENG.pdf.
[51] Global Energy Monitor, "Global Iron and Steel Tracker."
[52] Eurometal, *EBRD Lends Eu21.4 Mil to Metalfer for Low Carbon Steel Production - EUROMETAL*, January 16, 2023, https://eurometal.net/ebrd-lends-eu21-4-mil-to-metalfer-for-low-carbon-steel-production/.

further 35-40 MW of on-site solar PV. Both firms cite the lack of sufficient scrap steel and CBAM as the biggest near-term challenges for production.[53]

The CBAM has significant implications for Serbian iron and steel production, due to Serbia's high level of embedded carbon in steel products exported to the EU. While Metalfer's pivot to scrap-EAF powered by renewables puts it already a step ahead, other firms will have to shift to less carbon-intensive production processes. Successful adaptation will require further decarbonisation of electricity, switching from coal to renewables. Development and implementation of policies to support both of these transitions will be key to effectively responding to the CBAM in Serbia and aligning with overall emissions targets.

[53] SteelRadar, "Interview with HBIS Serbia: 'Supply of Steel Scrap for Steel Production Is the Biggest Problem in Serbia,'" Steel Radar, 2023, https://www.steelradar.com/en/interview-with-hbis-serbia-supply-of-steel-scrap-for-steel-production-is-the-biggest-problem-in-serbia/.

Shifting the market from conventional to green steel

Implications of CBAM for steel exporters to the EU

Seeking to level the playing field between EU producers subject to the EU ETS and avoid carbon leakage (where production of carbon-intensive goods is offshored to countries with weaker governance), the CBAM places a tax on carbon-intensive goods imported to the EU.[54] Goods produced in countries which already have carbon pricing systems will face lower CBAM costs so that carbon isn't double taxed upon import.

Companies which produce CBAM-covered goods with a lower carbon intensity are expected to see a comparative advantage versus companies with high carbon intensity. The steel sector is expected to face the highest absolute costs under the CBAM, in addition to accounting for the largest share of certificates under the scheme due to high emissions intensity and high value. In the steel sector, the high energy demand of production is expected to give countries with lower emissions intensity electricity a further comparative advantage in the European market. This dynamic is highly apparent in the Western Balkans – Albania has a carbon intensity of electricity much lower than that of the EU (211 kgCO_2/kWh), whereas Bosnia and Herzegovina and Serbia are more than triple, at 639 and 667 kgCO_2/kWh.[55]

Western Balkan industry perspectives on CBAM

While importers face the direct cost of the CBAM, exporters will also feel an impact beyond shifts in competitiveness and the cost of their products in the European market. Increased reporting requirements are going to be shifted down the supply chain, as

[54] European Commission, "Carbon Leakage," 2021, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/free-allocation/carbon-leakage_en; European Commission, "Commission Implementing Regulation (EU) 2023/1773 of 17 August 2023 Laying down the Rules for the Application of Regulation (EU) 2023/956 of the European Parliament and of the Council as Regards Reporting Obligations for the Purposes of the Carbon Border Adjustment Mechanism during the Transitional Period," 2023, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023R1773.
[55] Ember, "Electricity Data Explorer," 2025, https://ember-energy.org/data/electricity-data-explorer/.

importers calculate the embedded carbon in their products.[56] This comes with added data collection and capacity requirements for firms producing products for export to the EU. Stakeholders in Albania, Bosnia and Herzegovina, and Serbia are already feeling this, albeit to a varying degree. A split emerged between subsidiaries of EU companies and purely domestic firms, where those with EU parent companies were able to lean on the capacities and experience of their EU colleagues when it came to emissions reporting, and on the wallets of their parent firms when it came to technology that supports data collection (ALB2, ALB5, BIH1, BIH3). Even so, many stakeholders feel that increased capacity building is needed to be able to effectively respond to new reporting requirements.

Carbon pricing is also significant point of discussion. Several industry stakeholders view the prospect of carbon pricing in response to the CBAM as a threat to their competitiveness in the EU market, raising their production costs. Others see an opportunity for potential revenue generation that could be funnelled back into industry decarbonisation efforts (BIH2).

Despite trepidation around carbon pricing and reporting requirements, industry actors in Albania, Bosnia and Herzegovina, and Serbia all see opportunity in decarbonisation. Representatives from the steel and metals manufacturing industry expect the CBAM to push industry into long-term decarbonisation by encouraging investments in green technologies, energy efficiency, and circular economy measures in order to maintain and increase competitiveness on the EU market (BIH2, SRB5).

Technical pathways and innovations in steel decarbonisation

Scrap-EAF

For those firms not already producing steel using the scrap-EAF pathway, shifting to scrap-EAF steel production and/or increasing the share of scrap in production can contribute to immediately reducing emissions from the steel sector. Technologies are already available and tested, requiring five to seven times less energy than primary (BF-BOF) steelmaking. Rapidly shifting to the scrap-EAF route requires a tandem strengthening of circular economy practices and policies to ensure reliable scrap flows. 30% of current steel is produced by recycling scrap, potentially rising to 50% by mid-

[56] Simon Goess, "Implications of the Carbon Border Adjustment Mechanism for the Iron & Steel Sector," *Carboneer*, October 23, 2023, https://carboneer.earth/en/2023/10/implications-of-the-carbon-border-adjustment-mechanism-for-the-iron-steel-sector/.

century (see here for further info). This may be constricted by availability of low-contaminant scrap should steel be exported for use in the automotive sector. This is likely to be a constraint primarily for Serbia, which produces automotive-quality steel at the HBIS Serbia facility and has a growing automotive sector.[57] Tokyo Steel and Toyota Motors' "car to car" recycling programme could offer a proof of concept and could be a key learning opportunity for further integration of scrap-EAF pathways for automotive applications.

Hydrogen in the Western Balkans

Currently, the market for hydrogen in the region remains nascent, facing financial and regulatory hurdles.[58] While Serbia has a hydrogen strategy, there is a lack of specific, enforceable frameworks around hydrogen production and trade. Development of green hydrogen capacity and supply in the Western Balkans is expected to support medium- and long-term decarbonisation in the region.[59] Hydrogen production in the region can be supported by the significant solar, wind and hydropower potential in Albania, Bosnia and Herzegovina, and Serbia. The region also has several key fossil gas pipelines and interconnectors which can be refitted for H_2 in addition to regional seaports and large navigable rivers like the Danube, which can support further hydrogen trade.

The governments of all three countries have been looking to develop hydrogen resources as a tool for decarbonisation, and are planning to do so through the integration of hydrogen-ready fossil gas infrastructure.[60] However, the addition of new fossil gas infrastructure, with a lifetime of 30-40 years, threatens to lock-in fossil fuel dependency. It may also lead to higher investment costs over time – the cost of green hydrogen is expected to decrease, driven by steep drops in the cost of electrolysers and increasing integration of renewable energy.[61]

[57] HBIS Serbia, *Our Products*, 2025, https://hbisserbia.rs/our-products/.
[58] Dinko Durdevic, "Why Hydrogen OEMs Hesitate to Enter the Balkans Market," Hydrogen, *Energy News*, August 6, 2025, https://energynews.biz/why-hydrogen-oems-hesitate-to-enter-the-balkans-market/.
[59] Julius Ecke et al., *Powering the Future of the Western Balkans with Renewables.*, Study on behalf of Agora Energiewende (Enervis, 2022).
[60] Fuel Cells Works, "Serbia Plans Hydrogen Transport Through Gas Pipelines," January 7, 2025, https://fuelcellsworks.com/2025/07/01/green-investment/serbia-plans-hydrogen-transport-through-gas-pipelines.
[61] Eliseo Curcio, "Techno-Economic Analysis of Hydrogen Production: Costs, Policies, and Scalability in the Transition to Net-Zero," *International Journal of Hydrogen Energy* 128 (May 2025): 473–87, https://doi.org/10.1016/j.ijhydene.2025.04.013.

H_2-DRI-EAF

H_2-DRI-EAF is seen as a promising option for decarbonised steelmaking in the longer-term – however only when green, renewable hydrogen is used.[62] DRI processes that use only green hydrogen instead of fossil gas will produce essentially zero direct CO_2 in the reduction process. H_2-DRI is colour-agnostic when it comes to the source of the hydrogen, however using hydrogen produced with renewable sources will support further emissions reductions.

Hydrogen-ready DRI plants are being trialled globally, typically built with the capacity to fuel-switch between H_2 and LNG or propane gas depending on the cost of either fuel.[63] A coalition based in Sweden launched the HYBRIT H_2-DRI-EAF pilot production plant in 2018, with the goal of demonstrating market-readiness of low-emissions steel production in the EU.[64] The project reached the demonstration phase in 2025, even as major producers pull back on European H_2-DRI-EAF projects.

The Oshivela Project in Namibia could serve as a template for introduction of hydrogen-based iron production in Albania, Bosnia and Herzegovina, and Serbia. The plant is powered entirely by onsite solar on a smart mini-grid and produces hydrogen using a 12 MW electrolyser unit from China's Peric Hydrogen systems.[65] The project was supported with an initial investment of EUR13.7 million from the German Federal Ministry for Economic Affairs and Climate Action and a further EUR 12 million from the Government of the Netherlands.[66]

[62] Michele Rimini et al., *Hydrogen in Steel: Addressing Emissions and Dealing with Overcapacity*, no. 174, OECD Science, Technology and Industry Policy Papers (OECD, 2025), https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/03/hydrogen-in-steel_f4d15f8d/7e2edc69-en.pdf.
[63] Danieli, "Jindal Steel Orders Second Hydrogen-Ready DRI Plant in Oman," 2025, https://www.danieli.com/en/news-media/news/Jindal-Steel-orders-second-hydrogen-ready-DRI-plant-in-Oman_37_997.htm; AIST, "Salzgitter Selects Energiron DR for Hydrogen-Ready DRI Plant," Association for Iron & Steel Technology, 2023, https://www.aist.org/salzgitter-selects-energiron-dr-for-hydrogen-ready-dri-plant; OECD, *A Roadmap towards Circular Economy of Albania* (n.d.), https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/03/a-roadmap-towards-circular-economy-of-albania_0fd9c3a4/8c970fdc-en.pdf.
[64] "Fossil-Free Steel Production Ready for Industrialisation," *Hybrit*, 2025, https://www.hybritdevelopment.se/en/fossil-free-steel-production-ready-for-industrialisation/.
[65] HyIron, *Oshivela - Green Iron - Zero Emissions*, 2025, https://hyiron.com/oshivela/.
[66] European commission Directorate General for International Partnerships, "Global Gateway: Namibia Becomes a Pioneer for Africa's Green Transition," 2025, https://international-partnerships.ec.europa.eu/news-and-events/news/global-gateway-namibia-becomes-pioneer-africas-green-transition-2025-04-11_en.

For a 200 ktpa plant, the total investment required (including solar, batteries and the electrolyser system) is around EUR 210 million. Further cost reductions can be achieved by installing a reactor that can use iron ore concentrates or fines instead of pellets, reducing the overall levelised cost of the end product.

Onsite variable renewable electricity (VRE)

All of the above technical options are further complimented by integration of onsite renewables. Onsite renewables supports process electrification and reduces the emission intensity of electricity consumed in the production process. In Bosnia and Herzegovina and Serbia, with their high emission intensity of electricity as a result of entrenched coal generation, onsite renewables enable firms to independently pursue decarbonisation. The Metalfer Group steel plant in Serbia is a clear example of the potential for success of onsite VRE in decarbonising steel production processes in the Western Balkans and the challenges as well. In a recent interview, Metalfer Group president Branko Zečević states that while Metalfer wanted to continue to expand their solar installation to meet their energy demand, they were often delayed due to missing or outdated regulation.[67]

In Albania, extensive hydro resources present an opportunity for decarbonising iron and steel and the Kurum plant's purchase and use of hydropower plants for baseload power could be used as a template for other firms. However, integration of hydropower alone is risky as the Western Balkans faces increasing drought and water restrictions.[68] Successful integration of onsite renewable energy features hydropower as a battery, relying on wind and solar for primary generation and utilising hydropower installations for storage.

Legal obligations and good policy practices

Effective transformation of the steel industry in Albania, Bosnia and Herzegovina, Serbia – and globally – requires a fundamental market shift away from highly carbon intensive steel and towards less carbon intensive steel. Shifting the market requires policy and

[67] eKapija, "Green Steel and Circular Economy as Key to Sustainability in Metal Industry," April 7, 2025, https://www.ekapija.com/en/people/5130982/branko-zecevic-president-of-the-metalfer-group-green-steel-and-circular-economy.
[68] European Commission, "EDO European Drought Observatory," accessed November 28, 2025, https://joint-research-centre.ec.europa.eu/european-and-global-drought-observatories/current-drought-situation-europe_en.

technology changes to support firms already producing low carbon steel and to push the phase-out of fossil fuel-based production.

On the supply side, existing and emerging lower-carbon iron and steel production processes and technologies are highly energy intensive, substituting electricity for fossil fuels. Countries with affordable, green electricity are likely to be able to price lower carbon steel more competitively, even within the context of higher carbon prices and the CBAM. The role of electricity in the Western Balkans' green transition and implications of CBAM on that sector are discussed in the first paper in this series more extensively.

Policy intervention to respond to the CBAM and support the shift towards a green steel market is a critical, and, in some cases, already legal obligation because of the countries' accession process to the EU and membership of the European Council. This shift will likely require further policy intervention and the use of multiple levers on both the supply and demand side. Already, stakeholders in carbon intensive industries in the Western Balkans generally cite a lack of government support, strategy or willingness to respond to CBAM and develop a low carbon steel market. A clear momentum shift is needed. Policy interventions that were specifically requested include establishing clear benchmarks and guidance, improving digitalisation and data collection, and increasing workforce capacity development efforts.

Carbon pricing and CBAM

For the Western Balkan region, introducing a carbon price is a condition of complying with the Energy Community Treaty, effectively responding to the CBAM, and decarbonising the iron and steel sector. The price of carbon is a critical variable determining the impact of the CBAM on Albanian, Bosnian and Herzegovinian, and Serbian iron and steelmaking. As signatories to the Energy Community Treaty, all three countries are committed to adopting the EU *acquis* and to strive to introduce a carbon pricing system with an ETS. Development of a carbon price in the Western Balkans region has been slow and is being primarily occurring in the context of energy market integration with the EU (see the electricity report in this series for further detail).

As part of its ongoing CBAM readiness tracking, the Energy Community Secretariat conducted an impact assessment on four different carbon pricing instruments for the region, with a particular focus on alignment with the EU ETS. Carbon price convergence with the EU ETS brings potential for short-term emissions reductions in the steel sector driven by energy and operational efficiency gains and fuel-switching in the power sector.[69]

Carbon pricing also offers an opportunity to support market demand for low-carbon steel by levelling the higher cost of producing lower carbon steel with the lower cost of the BF-BOF route. In a weakening steel market, price sensitive consumers may not be willing to pay a green premium – stakeholders from energy-intensive industries in Albania, BIH and Serbia have expressed concerns about price competitiveness, even before the introduction of CBAM places a tax on the carbon content of their materials in the EU market. Implementing a carbon price can support the economic competitiveness of lower carbon steel and further decarbonisation efforts by raising revenue which can be invested back into the economy.

Subsidies and funding

Several stakeholders further noted a need for subsidies to support the integration of green technologies into their processes (ALB1, BIH1, BIH2, BIH3, SRB2, SRB3, SRB5). Stakeholders explicitly noted a need for financial support for both capital and operational expenditures but were particularly focussed on the need to upgrade and integrate new technologies to decrease emissions. Government support in this area can help de-risk investments in low carbon technologies and support research and development efforts in particularly ambitious companies.

The European Union already offers some funding opportunities through programs like the Western Balkans Investment Fund, including significant support for the power sector.[70] Multilateral and regional development banks including the EBRD are active in the region and can offer financing opportunities to support industrial decarbonisation. For Albania, Bosnia and Herzegovina, and Serbia to independently raise revenues to support industrial decarbonisation, implementing a domestic or regional carbon pricing scheme is a key step.

Western Balkans countries already spend significant amounts on subsidies for fossil fuels in the energy sector, artificially deflating prices for consumers and pinching already tight fiscal resources. The OECD found that between 2018-2023 Albania spent

[69] Energy Community, "EU Assessment Highlights Carbon Pricing Options to Accelerate EU Integration and the Energy Transition in the Energy Community," 2025, https://www.energy-community.org/news/Energy-Community-News/2025/01/14.html.
[70] Christian Egenhofer and Damir Dizdarević, "To Unlock EU-Western Balkans Energy Investment, We First Need Accurate Emissions Data," *CEPS*, May 28, 2025, https://www.ceps.eu/to-unlock-eu-western-balkans-energy-investment-we-first-need-accurate-emissions-data/.

EUR 170.2 million, Bosnia and Herzegovina EUR 95.3 million, and Serbia EUR 2 billion on fiscal support for fossil fuels.[71] Adapting regulation to support renewable energy rather than fossil fuels will have the knock-on effect of supporting decarbonisation across sectors and can improve fiscal efficiency while supporting vulnerable segments of society.[72,73]

Monitoring, reporting, verification and accreditation

Monitoring, reporting, verification and accreditation (MRVA) in the iron and steel sector is a critical part of aligning with EU emission standards and implementing any ETS. Stakeholders cite a lack of data as a key short- and medium-term challenge to contend with in terms of both complying with CBAM reporting and potential implementation of a domestic or regional ETS.

As members of the Energy Community, Albania, Bosnia and Herzegovina, and Serbia are all obliged to transpose and implement the MRVA system. As of 2025, no country has fully implemented the MRVA system as required, although progress has been made by Serbia. In Serbia, HBIS and Metalfer have obtained a GHG emissions permit for their respective installations in late 2024.[74] Both are obligated to provide annual emissions reports to Serbia's accrediting body, although those reports are not publicly available currently.

[71] OECD, *Energy Prices and Subsidies in the Western Balkans: Reforms for a Fair and Green Future, OECD Development Pathways*.
[72] OECD, *Energy Prices and Subsidies in the Western Balkans: Reforms for a Fair and Green Future, OECD Development Pathways*.
[73] For further detail see the report "Decarbonising electricity in Albania, Bosnia and Herzegovina and Serbia", https://climateanalytics.org/publications/decarbonising-electricity-cement-iron-and-steel-and-chemicals-in-albania-bosnia-and-herzegovina-and-serbia
[74] Danilo Lukic- Republic of Serbia Ministry of Environmental Protection, "eGHG MRV Information System," eGHG MRV Information System, 2025, https://e-ghg-portal.ekologija.gov.rs/sign_in.

Implementation of MRVA systems remains slow, although progress is still being made

	Establish legal basis	Designate Competent Authority	Set scope for operators and gases covered	GHG emission permitting mechanism	Operators establish monitoring plans	Establish accreditation body	Accreditation process functioning
ALB	In progress	Done	In progress	Not started	Not started	In progress	Not started
BIH	In progress	Not started	Not started	Not started	Not started	Not started	Not started
SRB	Done	Done	Done	Done	In progress	Done	In progress

✓ *Done* ⊖ *In progress* ✕ *Not started*

Table 1: Progress on MRVA implementation. Adapted from Energy Community Secretariat (2025).

Short-term workforce capacity building

Stakeholders in carbon intensive industries in Albania, Bosnia and Herzegovina, and Serbia were emphatic about the need for short-term capacity building to immediately respond to the reporting requirements of the CBAM and eventual implementation of the national MRVA scheme (ALB1, ALB4, BIH1, BIH2, BIH5, SRB3, SRB5). Those with parent companies based in the EU were able to rely on the internal expertise and capacity of their EU-counterparts or parent companies while local SMEs faced the most significant capacity gaps. Specific interventions that could be deployed nearly immediately include hosting training workshops on CBAM reporting and publishing training materials online. Trainings on emissions reporting can also support successful implementation of MRVA systems. Governments in each country can also facilitate firm-firm exchanges, allowing industry leaders across countries to share experiences and knowledge to build capacity and regional cooperation.

While capacity-building efforts in the workforce will also need to focus on broader issues including retraining and upskilling for those impacted by the transition from traditional primary steelmaking to green steel, there is an immediate and critical need to respond to the skills and knowledge gap in emissions accounting and reporting in carbon-intensive industry in the Western Balkans which governments must respond to in order to support domestic industry maintaining access to the European market.

Circular economy policies

While municipal waste management in Albania, BIH and Serbia is a continual challenge and often highly informal, ferrous metal recycling is an outlier and tends to be fairly efficiently collected, recycled and traded on the secondary market.[75] Despite this, industry actors in the Western Balkans consistently cite the fact that domestic scrap flows fail to meet their needs, with steel manufacturers commonly importing scrap metal from Türkiye or elsewhere (SRB5).[76]

Albania, BIH and Serbia should work to improve waste management programmes and implement policies already in place. Policies that support contents labelling (e.g. passports or ecolabelling) during production and set clear requirements for sorting and shredding at the end of life can help ensure recycled material can be used across the broadest possible range of future applications. Albania already has legislation around eco-labelling, but critical implementation steps including establishing guidelines or a competent certification body have not yet been taken.[77]

Permitting for onsite VRE

Loosening permitting requirements can ease the way for companies to integrate onsite renewable energy projects. Permitting can be an arduous process – business surveys in the Western Balkans found that business owners commonly cite licensure and permitting as a major constraint. Bosnia and Herzegovina faces particular challenges in this area – firms in BIH reported wait times over 100 days for construction-related permits.[78]

Strategic loosening of bureaucratic red tape and prioritisation of permitting around onsite integration of VRE for energy-intensive industry supports sectoral decarbonisation by making it easier for domestic and foreign investment in decarbonisation. This would also demonstrate ongoing commitment to aligning with the EU and achieving climate goals, likely supporting further provision of financing from European entities.

Green public procurement

Green public procurement (GPP) requirements can be used by local and national governments in Albania, Bosnia and Herzegovina, and Serbia to support demand for lower-emission steel from local and regional manufacturers. Development in GPP policy is ongoing in the Western Balkans and is primarily driven by the Green Agenda for the

[75] World Bank Group, *Situational Analysis - Municipal Waste Management in Serbia* (2023), https://thedocs.worldbank.org/en/doc/8c0c355b685476cdcc2154a3ecf42768-0080012024/original/Situational-Analysis-Municipal-Waste-Management-in-Serbia.pdf.
[76] SteelRadar, "Interview with HBIS Serbia."
[77] OECD, *A Roadmap towards Circular Economy of Albania*.
[78] World Bank Group, "Enterprise Surveys Data," Enterprise Surveys, 2024, https://www.enterprisesurveys.org/en/data.

Western Balkans and other initiatives to align the region with EU standards in preparation for accession. High-representatives from the Western Balkans 6 issued a joint declaration and recommendations on developing regional GPP criteria after the latest Berlin Process meetings.[79] Serbian procurement guidelines already call for the inclusion of environmental impact considerations, and the Office of Public Procurement has hosted workshops for contracting officers on GPP principles. However, Bosnia and Herzegovina, and Albania have made more limited progress on integrating GPP into their public procurement frameworks.[80]

Further integration with the EU offers opportunity for policy learning and development based on successful practices in EU Member States and in the private sector from supranational to sub-national levels. The CO_2 Performance Ladder in the Netherlands is a GPP mechanism that certifies the climate commitment of companies – the more CO_2 companies reduce, the higher up the ladder they move and more incentives are unlocked.[81] Firms that are higher up the ladder receive a discount when bidding for a public tender. The CO_2 Performance Ladder helps to integrate decarbonisation on both the supply and demand side of public procurement by incentivising firms to decarbonise and incentivising procurement officers to award contracts to companies with higher climate ambition.[82] It relies on third party accreditors to ensure companies comply and does not introduce significantly higher transaction costs for procurement officers.

[79] Regional Cooperation Regional Cooperation CouncilCouncil, "Regional Green Public Procurement Criteria for the Western Balkans Six," 2025, https://www.rcc.int/docs/768/regional-green-public-procurement-criteria-for-the-western-balkans-six.
[80] European Commission, *Serbia Report 2025 - Enlargement and Eastern Neighbourhood* (2025), https://enlargement.ec.europa.eu/serbia-report-2025_en; European Commission, *Albania Report 2025 - Enlargement and Eastern Neighbourhood* (2025), https://enlargement.ec.europa.eu/albania-report-2025_en; European Commission, *Bosnia and Herzegovina Report 2025 - Enlargement and Eastern Neighbourhood* (2025), https://enlargement.ec.europa.eu/bosnia-and-herzegovina-report-2025_en.
[81] Irene Domínguez Pérez et al., "Green Public Procurement of Cement and Steel in the EU: An Overview of the State of Play," Bellona, 2024, https://eu.bellona.org/publication/gpp-of-cement-and-steel-in-the-eu/.
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Conclusions

The CBAM reorients the iron and steel market towards decarbonisation, where exporters with lower carbon content will gain a competitive advantage over highly carbon-intensive producers. Western Balkan exporters of iron and steel are already facing pressure to decarbonise. Early movers are likely to see a comparative advantage and illustrate that there are already accessible routes to decarbonisation. Serbia is likely to be the most impacted, with its exports expected to be less competitive in the European market. This is due to its highly carbon-intensive production and electricity, and largest overall exports of CBAM-covered iron and steel products to the EU..

Several producers in the region are already transitioning to green steel production, utilising scrap-EAF production processes supported by integrated renewables and green power purchase agreements. However, the industry still faces significant decarbonisation challenges as BF-BOF production pathways (which utilise coke and fossil gas as feedstocks) remain entrenched. Technical pathways to decarbonisation in the region include uptake of EAF-based production, using either scrap or DRI as inputs. Production of iron and steel using green hydrogen as an input is an option in the medium- and long-term. There are promising pilot projects that could be copied in Albania, Bosnia and Herzegovina and/or Serbia, taking advantage of the region's significant renewable energy potential.

Albania, Bosnia and Herzegovina, and Serbia will need to take decisive policy steps to support the reorientation of Western Balkan steel supply chains towards a low carbon, competitive future. One of the key policy options to support decarbonisation of the iron and steel sector in the Western Balkans region is establishment of a carbon price or ETS and integrating the sector into this program.

Further steps include improving industry access to green finance, updating permitting for on-site renewables, supporting capacity building and monitoring, reporting, verification and accreditation (MRVA) and leveraging public procurement to boost demand for green steel. Implementing an ETS and MRVA programme are critical steps to align with the EU and deepen regional cooperation. Reducing the embedded carbon in iron and steel products produced in Albania, Bosnia and Herzegovina, and Serbia offers multifaceted opportunity due to the comprehensive whole-of-system approach required. Reducing fossil fuel subsidies and supporting domestic industry can improve fiscal efficiency while making iron and steel more competitive in the EU market. Implementing circular economy policies can help formalise waste management and bring recycling rates in-line with the EU while supporting security of supply of a key feedstock for green steel.

The CBAM is already shifting the landscape for iron and steel producers in Albania, Bosnia and Herzegovina, and Serbia. Decisive action from the private sector accompanied by clear policy and regulatory support from national governments can support the region's competitiveness in the European market and alignment with the EU, opening further opportunity.

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Annex 1

Emerging definitions and standards for 'near zero steel' or similar.

	Product	Approach	Primary steel	Secondary steel
IEA	Crude steel	Sliding scale	**0.4 tCO_2-e/t** (0% scrap)	**0.05 tCO_2-e/t** (100% scrap)
Responsible Steel	Crude steel	Sliding scale	**0.4 tCO_2-e/t** (0% scrap)	**0.05 tCO_2-e/t** (100% scrap)
Low Emissions Steel Standard	Hot-rolled steel	Sliding scale	**<0.52 tCO_2-e/t** Reinforcing and structural: **<0.47 tCO_2-e/t** (both figures 0% scrap)	**<0.17 tCO_2-e/t** Reinforcing and structural: **<0.12 tCO_2-e/t** (both figures 100% scrap)
Climate Bonds Initiative	Finished steel product	Weighted pathway	**1.81 tCO_2-e/t** by 2030 **0.12 t CO_2/t** by 2050	**0.32 tCO_2-e/t** by 2030 **0.12 tCO_2-e/t** by 2050
Global Steel Climate Council	Hot-rolled steel	Product-based Pathway	Flat products: **1.31 tCO_2-e/t** by 2030 **0.12 tCO_2-e/t** by 2050 Long products: **1.11 tCO_2-e/t** by 2030 **0.12 tCO_2-e/t** by 2050	N/A
China Iron & Steel Association	Crude steel or hot-rolled steel	Sliding scale	**0.4 t tCO_2-e/t** (0% scrap)	**0.05 tCO_2-e/t** (100% scrap)

Table 2. Emerging definitions and standards for low-emissions steel. Source: European Commission[83]

[83] European Commission JRC, *Defining Low-Carbon Emissions Steel: A Comparative Analysis of International Initiatives and Standards* (Publications Office of the European Union, 2025), https://data.europa.eu/doi/10.2760/4271464.

Annex 2

List of industry interviewees

Interviewee	Country	Industry
ALB1	Albania	Cement
ALB2	Albania	Cement
ALB3	Albania	Cement
ALB4	Albania	Cement
ALB5	Albania	NGO
BIH1	Bosnia and Herzegovina	Cement
BIH2	Bosnia and Herzegovina	Metals and manufacturing
BIH3	Bosnia and Herzegovina	Cement
BIH4	Bosnia and Herzegovina	Metals and manufacturing
BIH5	Bosnia and Herzegovina	Metals and manufacturing
SRB1	Serbia	Chemicals
SRB2	Serbia	Mining and metals
SRB3	Serbia	Construction
SRB4	Serbia	Construction
SRB5	Serbia	Steel

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