OECD Steel Outlook 2025

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Foreword

The steel industry contributes significantly to economies, producing a vast array of products that are used to support investment in infrastructure, and manufacturing machinery and equipment, as well as a broad range of consumer items. The industry is now confronted with growing challenges in the form of rising excess capacity and the resulting serious trade and adjustment issues that have emerged.

The OECD's Steel Committee has played a vital role in advancing transparency in the above-mentioned areas, providing a platform for exchanging views and information and promoting international co-operation. This report highlights the important work recently undertaken by the Steel Committee in key areas. It provides a comprehensive assessment of the current situation and offers an informed outlook for the future, assessing capacity and market developments, government subsidies and other support measures, trade policy actions, and the efforts of the industry to enhance environmental performance by shrinking its carbon footprint.

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Abbreviations and acronyms

AD	Antidumping
ASEAN	Association of Southeast Asian Nations
BF	Blast furnace
BMB	Below market borrowing
BOF	Basic oxygen furnace
BRI	Belt and Road Initiative
CAGR	Compound annual growth rate
CCU	Carbon capture utilisation
CCUS	Carbon capture utilisation and storage
CIS	Commonwealth of Independent States
CFR	Cost and freight
CO_2	Carbon dioxide
CV	Coefficient of Variation
CVD	Countervailing duty
DRI	Direct reduced iron
EAF	Electric arc furnace
EBITDA	Earnings before interest, taxes, depreciation, and amortisation
FOB	Free on board
GDP	Gross domestic product
GFSEC	Global Forum on Steel Excess Capacity
HBI	Hot briquetted iron
HRC	Hot-rolled coil
IEA	International Energy Agency
IOE	Iron ore electrolysis
ISSB	International Steel Statistics Bureau
ITA	Investment tax allowance
JISF	Japan Iron and Steel Federation
LSEG	London Stock Exchange Group

MAGIC	MAnufacturing Groups and Industrial Corporation
ME	Middle East
MENA	Middle East and North Africa
MMBtu	Metric Million British thermal unit
mmt	Million metric tonnes
mt	Metric tonnes
n.d.	Undated
OECD	Organisation for Economic Co-operation and Development
PBOC	People's Bank of China
POE	Private-Owned Enterprise
PS	Pioneer status
R&D	Research and development
SEAISI	South East Asia Iron and Steel Institute
SOE	State-Owned Enterprise
worldsteel	World Steel Association
WSD	World Steel Dynamics
WTO	World Trade Organization

Executive summary

Steel industry woes will likely persist in 2025 and thereafter

Substantial increases in steelmaking capacity of up to 6.7% (165 million metric tonnes [mmt]) are planned worldwide from 2025 to 2027, which, if realised, will exacerbate global excess capacity. Asian economies are expected to account for 58% of the new capacity, led by substantial increases in the People's Republic of China (hereafter "China") and India. Cross-border investment is involved in about 16% of the total tonnage to be added from 2025 onward, with China playing a leading role in such investment.

With demand growth expected to be sluggish at best, capacity utilisation could once again decline towards 70%, putting enormous pressure on even highly competitive steelmakers. Already, steel prices have declined to their lowest levels in around four years, although they appear now to be bottoming out. Profitability has experienced a similar trajectory, falling sharply from the relatively strong 2021 level.

Steel demand prospects vary across regions. Solid growth in many emerging markets during 2024 was largely offset by a strong contraction in demand in China and a decline in the OECD area. Through 2030, world demand is expected to grow by 0.7% per year. Demand in the OECD area will remain roughly constant, while Chinese demand will decline appreciably due to the downturn in construction and structural shifts in China's economy. Prospects are brighter in the Association of Southeast Asian Nations (ASEAN) and Middle East and North Africa (MENA) areas, where demand will grow strongly.

Subsidies continue to distort competition and have contributed significantly to excess capacity in economies outside the OECD

Competition in the steel industry continues to suffer from a lack of a level playing field. Some governments intervene heavily with policies aimed at promoting industrialisation, strengthening and/or expanding the domestic steel industry, reducing steel import dependency and/or indirectly supporting downstream manufacturing in higher value added activities. Steel subsidies persist and have become increasingly prominent in regions where steelmaking capacity is growing the fastest, particularly in China and the MENA and ASEAN regions.

China's subsidisation rate is ten times that of OECD countries. In addition to below-market borrowings, measures include subsidised energy prices, direct grants and preferential tax treatment. The support measures distort competition by providing: 1) aid to facilities that might otherwise be closed; and 2) incentives for investment that might otherwise be commercially unjustified.

A surge in Chinese exports is leading to a sharp increase in trade measures globally

Europe and the Commonwealth of Independent States/Ukraine area have experienced sharp declines in exports in recent years. Exports from the Asian and African/Middle East areas have increased significantly, led by a rapid increase in exports from China. Chinese steel exports surged to a record level of 118 million tonnes in 2024.

The pressures that low-priced exports have had on countries have led to a surge in new antidumping cases. During 2024,19 governments initiated 81 antidumping investigations involving steel products, a five-fold increase from the 2023 level and near the 2016 steel crisis level. Almost 80% of the cases were initiated against Asian producers, with China alone accounting for more than one-third of the total. In addition to the product-specific dumping cases, a growing number of countries have introduced broader measures to protect their steel industries through sector-wide blanket increases in steel tariffs. This increase in product-specific and broader trade actions reflects the direct and indirect effects that sources of excess capacity are having on international trade flows of steel.

Steel producers subject to trade measures often seek to ease the impact by shifting their exports to other markets with no or less restrictive trade measures or exploring ways to circumvent them. They do so by selling upstream or downstream products not subject to the trade measures in the country imposing the trade measures and/or by shipping products to intermediary countries for further processing/finishing and eventual export to the countries where the trade measures are in force.

OECD analysis indicates that during 2013-20, the amount of suspicious trade (involving rerouting of steel trade) totalled 21.5 million metric tonnes (EUR 13.3 billion), representing 17.6% of the total steel trade targeted by antidumping/countervailing duty measures. Concern over circumvention has resulted in a growing number of countries developing mechanisms to discourage the practice.

There are challenges to achieving steel industry decarbonisation

The ongoing excess capacity problem is reducing the steel industry's profitability and the capital available for investing in new technologies, hampering the industry's efforts to decarbonise. Moreover, more than 40% of the 165 mmt of new steelmaking capacity entering the market during 2025-27 is expected to be based on the relatively emission-intensive blast furnace/basic oxygen furnace (BF/BOF) process. Reducing emissions in the steel industry requires profound and costly changes in steelmaking operations. The changes include: 1) improved performance through improved energy efficiency; 2) the switching of fuels away from gas and coal; 3) the development and deployment of new technologies to produce steel; and 4) expansion of carbon capture utilisation and storage efforts. Given the longevity of steelmaking equipment, investing in new production technologies requires confidence that the investments will be economically viable over the very long term, preconditions for which include healthy market conditions characterised by a level playing field and the absence of excess capacity.

The cost and methods to decarbonise steelmaking across and within countries will ultimately vary significantly depending on the steelmaking technologies employed and the condition of steelmaking facilities. A survey of major producers reveals that 74% of companies intend to use carbon capture, utilisation and storage technologies in their integrated (BF-BOF) facilities to control emissions, while 11% are exploring groundbreaking iron oxide technologies. With respect to electric furnaces, 52% of the companies intend to use hydrogen-based technologies to produce iron for electric furnace steel production.

Significant attention has recently been given to hydrogen-based processes for producing iron-intermediate products, such as direct-reduced iron and hot-briquetted iron. These technologies rely on high-grade iron ores and substantial renewable energy availability, both of which are unevenly distributed globally. As a result, steel production locations and international trade flows in iron and steel are likely to undergo significant shifts in the future.

Longer-term industry prospects would be improved by greater international co-operation

The surge in exports of low-priced steel from China has disrupted international markets, resulting in growing trade tensions that seem likely to persist in the near term in light of sluggish market growth and increased capacity. Efforts to address the root causes and consequences of the structural imbalance between global capacity and demand need to intensify to avoid further deterioration of the situation over the longer term. In the meantime, affected countries will benefit from working together to share data, knowledge and experiences to help mitigate the devastating impacts of global steel excess capacity on their economies.

On all fronts, enhanced international co-operation between governments and the industry could play a significant role in easing trade tensions and improving the longer-term prospects for the industry. The participation of all major players is key in this regard.

1 A level playing field is needed for a brighter outlook in the global steel industry

Trade and adjustment challenges in the steel industry are intensifying, exacerbated by growing global excess capacity. Subsidies and other non-market policies and practices are the root cause of the industry's current problems. Significant shifts in regional steel production and trade are occurring, and, with profitability in the industry weakening, progress in decarbonising steelmaking processes could be significantly undermined. Enhanced international co-operation to eliminate excess capacity and market distortions would help level the playing field and lead to a brighter long-term outlook for the global steel industry.

Steel is the backbone of developed and developing economies alike

Steel is ubiquitous – used in buildings and bridges, cars, railways, tanks and ships, medical equipment, power plants, rockets, nuts and bolts, needles and pins, pipes and tubes, hammers and drills, and much more. Close to 2 billion tonnes are produced worldwide every year, far exceeding all other metals combined. Innovation has been key to the continued prosperity of the industry; approximately 75% of the 3 500 grades of steel now on markets have been developed over the past 20 years (Worldsteel, 2025[1]). Moreover, technological advances have greatly enhanced the efficiency of the industry while curbing the environmental pollutants generated during production.

The industry is highly capital-intensive. Plants range in size from induction furnace-based facilities that produce several thousand tonnes to large integrated facilities with 14 million tonnes of annual capacity per year. Even for smaller facilities, investment costs for new plants can be high, topping USD 1 billion (US dollars). The larger a plant is, the more important it is as a source of employment, as it can provide thousands of jobs at the steel plant itself while generating significantly more employment in the communities where the plants are located. The sector employs around 6 million workers worldwide, with over 1 million steel workers in OECD countries alone.

The steel industries in OECD countries have long been highly innovative and productive, as revealed in patent data, labour productivity and the types of steel products they produce (de Carvalho and Sekiguchi, 2015[2]). Many of these products are essential for building the renewable energy systems needed to transition to low-carbon economies, such as advanced stainless steel for solar panels and high steel grades for lighter wind turbine towers. Corrosion-resistant steel provides opportunities in many emerging energy industries, including innovative, cost-effective new types of steel being developed for water electrolysis systems in hydrogen production (Shavit, 2024[3]). Thus, while the industry is making significant efforts to reduce its carbon emissions from steel production, its products support the green transition across many other economic activities.

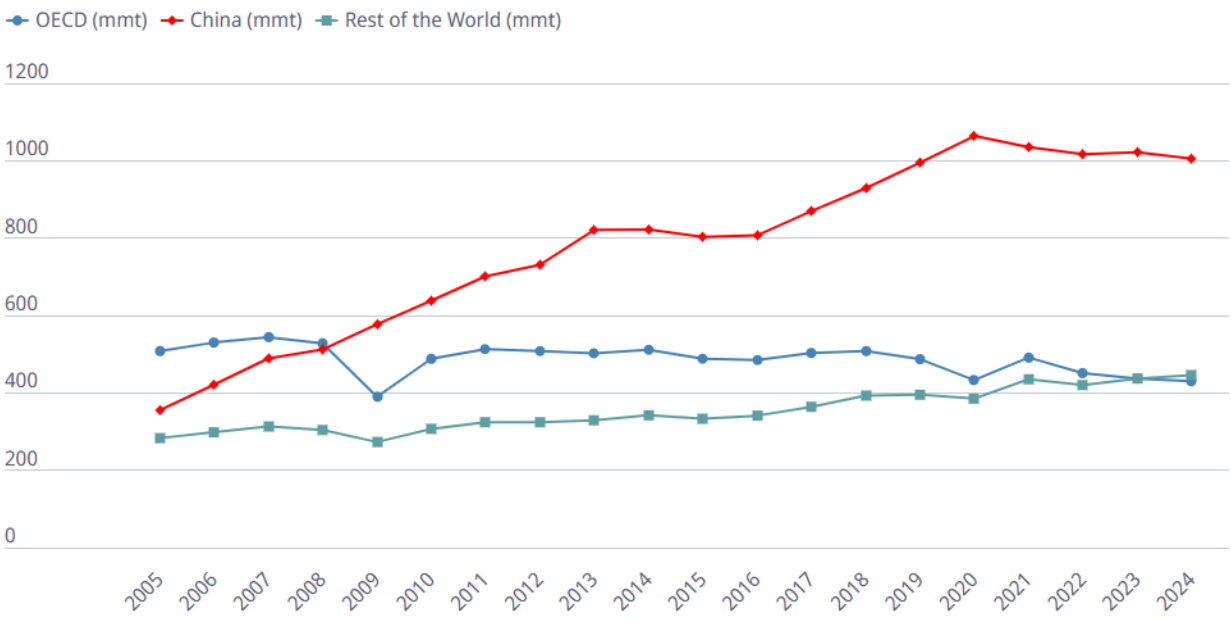
Once led by OECD countries, the steel industry has experienced a surge in investment in emerging economies

Interest in investing in steelmaking is keen worldwide despite the high capital costs and expertise required. Close to 100 countries produce molten steel. Investments in the People's Republic of China (hereafter "China") have propelled the country from a moderate production of 26 million tonnes in 1975 (6% of world production at the time) to a capacity capable of producing well over 1 billion tonnes of steel per year (accounting for more than half of world production now), though production has recently shown some signs of stabilisation. At the same time, the role of steel producers in OECD countries has diminished considerably (Figure 1.1), with the collective share of OECD countries in world production halving over the past two decades to 22% in 2024, even as some OECD countries like Korea and Türkiye have expanded, and the number of OECD countries has increased.

Even though most Chinese steel production goes to domestic use, the sheer size of China's steel sector means that movements in its industry have huge effects on world markets. Since the peak in Chinese steel demand in 2020, the contraction in construction demand has not been accommodated by proportionate adjustments in steel production, fuelling its steel exports abroad (Figure 1.2). The rise in China's position in the global steel industry is not a purely market-driven outcome. Instead, it reflects a steel industry expansion driven by market-distorting subsidies and other non-market policies and practices.

Figure 1.1. Steel production in OECD countries, China and the rest of the world, 2005-24

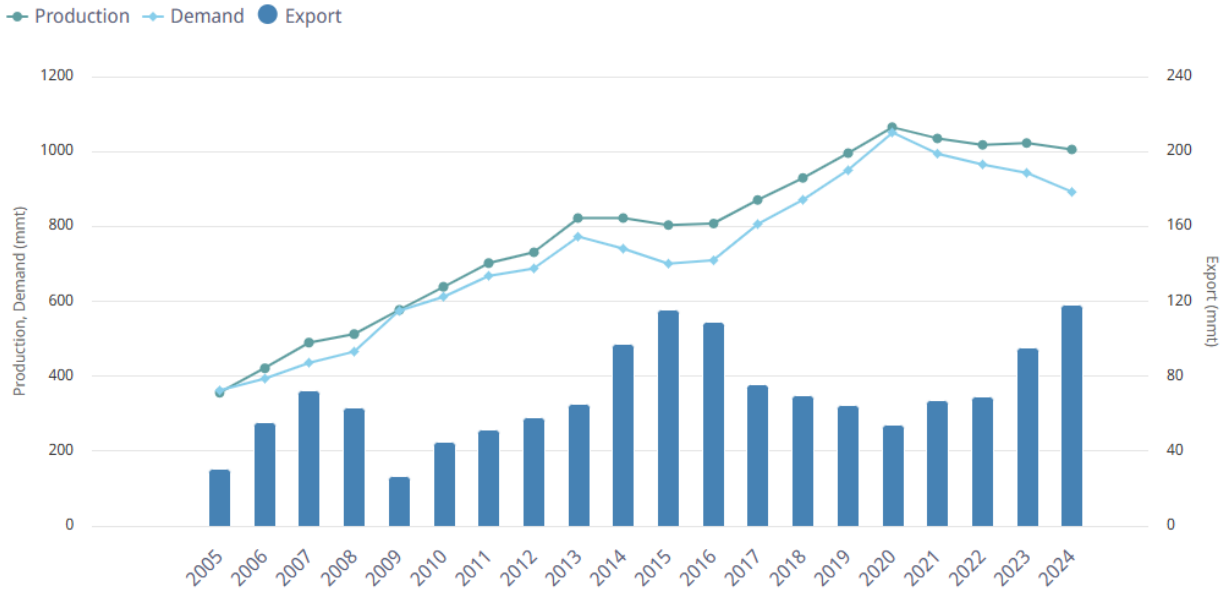
In million metric tonnes (mmt)



Source: World Steel Association (2024[4]), *2024 World Steel in Figures*, https://worldsteel.org/wp-content/uploads/World-Steel-in-Figures-2024.pdf; and OECD, based COMTRADE and ISSB.

Figure 1.2. China's steel production, demand and exports, 2005-24

In million metric tonnes (mmt)



Source: World Steel Association (2024[4]), *2024 World Steel in Figures*, https://worldsteel.org/wp-content/uploads/World-Steel-in-Figures-2024.pdf; and OECD, based COMTRADE and ISSB.

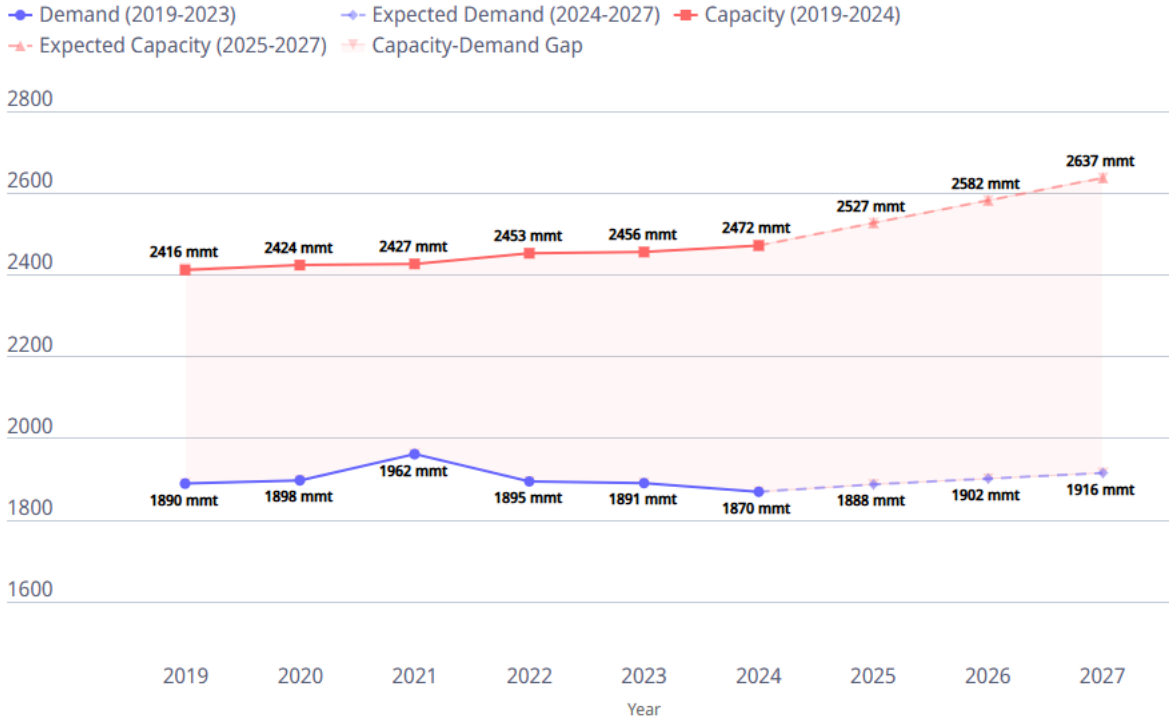
Steel producers are facing significant challenges as a result of growing excess capacity

The global steel market is currently in a precarious state. Excess capacity is growing from unsustainably high levels, fuelled by market-distorting subsidies and other non-market practices, mainly in countries outside the OECD. Substantial increases in capacity are planned worldwide over the next three years, with 165 million metric tonnes (mmt) of new capacity additions projected during 2025-27, despite only modest global steel demand growth.

Asian economies are expected to account for 60% of the new capacity, led by substantial increases in China, India and the Association of Southeast Asian Nations (ASEAN). Capacity growth is being further fuelled through cross-border investments involving Chinese steel companies. Most future cross-border investments are expected to occur in Asia and Africa. In recent years, Southeast Asia has been the primary destination for China's foreign investment, which has contributed to the region's growing excess capacity. Looking ahead, almost three-quarters of future global cross-border investments will be directed towards the construction of blast furnace/basic oxygen furnace (BF/BOF) steelmaking, which is a relatively high generator of carbon emissions.

Figure 1.3. Recent (2019-24) and forecasted (2025-27) global steel excess capacity

In mmt



Source: OECD desk research for capacity data and demand and OECD estimates of steel demand derived from its long-term steel demand model (see Chapter 4), taking into account the *Short-Range Outlook* published by the World Steel Association (https://worldsteel.org/). Linear interpolation was employed.

With the outlook for global capacity growth outpacing demand, the gap between capacity and demand is expected to increase worldwide to 721 mmt by 2027 (Figure 1.3). This level of excess capacity would exceed the current production in all OECD countries combined by 290 million tonnes. With demand growth

expected to be sluggish, capacity utilisation could once again decline towards 70%, putting enormous pressure on the viability of even highly competitive steelmakers.

Steel-using downstream industries in OECD countries, such as automotive or machinery manufacturing, also feel the impact of global excess capacity, as cheaper inputs give unfair, non-market advantages to competitors in countries that are sources of global steel excess capacity. Global excess capacity can thus inflict significant long-term economic damage throughout the steel supply chain in countries that do not engage in market-distorting policies and practices. This underscores the importance of the work of the Global Forum on Steel Excess Capacity to address global excess capacity and its consequences.

Steel excess capacity puts jobs, investments and supply chains at risk

The combination of excess capacity, oversupply and price pressures is eroding steel companies' profit margins globally. Steel industry profitability margins have declined noticeably over the last few years and are currently close to historic lows.

The need to level the playing field is more urgent than ever. Global excess capacity and the subsidies and other non-market policies and practices that contribute to it have significant negative impacts on market-oriented steel industries that suffer from its effects. Global excess capacity leads to steel job losses, weaker industrial supply chains and reduced investment in innovation and next-generation steel technologies.

Downstream industries that are heavily reliant on steel, including energy and other strategic sectors, face risks as well. In particular, there is a longer-term risk of market dependence and economic vulnerability for these industries as excess capacity depresses steel prices and encourages the production of indirect exports of steel-containing goods. As OECD countries become more reliant on foreign-subsidised steel, critical infrastructure and manufacturing could face risks in times of crisis.

Subsidies and other support measures are fuelling excess capacity while distorting competition

Market-distorting subsidies and the host of other government supports and interventions are driving excess capacity and distorting competition. Some governments, mostly outside of the OECD, intervene heavily with non-market policies and practices targeting the steel industry, which aim to create national champions, expand domestic steelmaking capacity regardless of market fundamentals, maintain failing firms, or indirectly support higher value added production of steel-intensive goods further downstream. As a result, the steel industry is one of the most heavily subsidised industrial sectors globally.

China's steel subsidisation rate (as a percentage of firm revenues) is five times higher than the average for other partner economies, with Chinese state-owned enterprises (SOEs) receiving even more than private firms in China.[1] The subsidisation rate in partner economies is, in turn, double that of OECD countries (Figure 1.4). Government supports for the steel sector have become increasingly prominent in regions where steelmaking capacity is rapidly expanding, such as in China, Middle East and North Africa (MENA) and ASEAN areas. The OECD Steel Committee regularly reviews recent subsidy developments in areas where capacity is growing rapidly and publishes its findings each year. Two recent reports examined Chinese financial incentives to encourage technological upgrades and value-added steel production as well as energy and other subsidies in the MENA and ASEAN areas.[2]

Subsidies have a significant effect on capacity expansions in countries outside the OECD. Where subsidies are used, measures include below-market borrowings, government grants, subsidised energy prices and preferential tax treatment. New research presented in this Outlook finds that a grant worth USD 1 million annually sustained over a number of years is associated with an increase of some 5 000-10 000 metric

tonnes in steel production capacity in partner economies. Grants are cash infusions to improve the financial situation of companies. Other types of subsidies received by steel firms and covered by OECD estimates are below-market borrowings (loans provided at better conditions than what the market would offer absent government intervention or government implicit guarantees) and tax concessions (special provisions for selected firms that lower the taxes that would otherwise be payable).

Figure 1.4. Steel subsidisation rates in China, OECD countries and other countries, 2006-22

As a percentage of firm revenues

Note: Subsidies indicated in the figure above are the sum of the subsidies entailed in cash grants, below-market borrowings and income tax concessions.
Source: OECD Manufacturing Groups and Industrial Corporation (MAGIC) database.

There are, however, many other support measures for which estimates are difficult to obtain, due to both governments' lack of transparency and methodological difficulties. They include equity infusions inconsistent with market-based conditions, non-market-based equity swaps, government provision of goods and services for less than adequate remuneration, export-contingent subsidies, and input support at preferential or non-market rates, including land, energy and raw materials to steel companies at preferential rates.

Pervasive subsidisation leads to capacity expansion that would not occur under market conditions, or keeps loss-making steel producers in the market, encouraging them to maintain their steel production levels. Subsidies distort markets by generating excess capacity and fuelling oversupply of steel. The surplus steel from the subsidising countries is then exported at prices that do not reflect the true production costs. The underpriced steel, in turn, displaces the steel production of market-oriented steel producers in importing regions, reducing their profitability and depressing their market share at home and in third

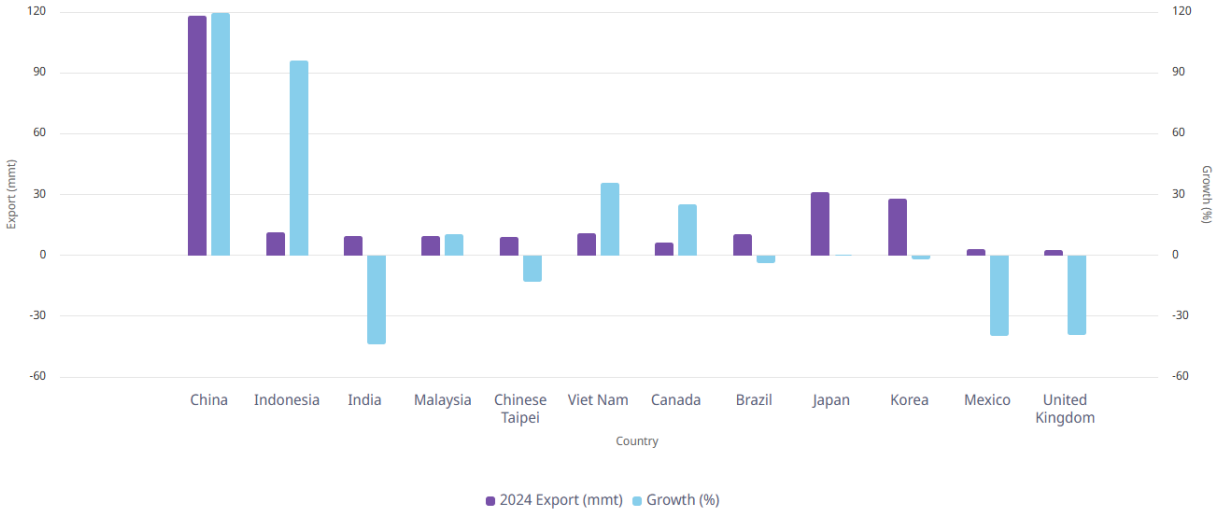
markets abroad. Given the long lifespans of steel plants, coupled with the extremely high monetary and social costs of closing those plants once they are put in place, the excess capacity generated by these policies can, unfortunately, have negative effects that linger on for decades.

These interventions create structural advantages for firms benefiting from them and undermine fair competition and supply chain resilience. The result is a global steel market distorted by non-market forces, where producers which do not benefit from the subsidies cannot compete on equal footing. Recent OECD analysis of subsidies reveals that the steel industry is one of the largest sectoral recipients of subsidies, a result that is also clear from the prominence of steel in countervailing duty trade remedy cases.

Trade actions have increased as steel trade flows shift significantly

The continued problems of excess capacity and subsidisation have led to significant shifts in steel trade flows. Chinese steel exports have more than doubled since 2020 (Figure 1.5), reaching a record-high 118 mmt in 2024, while the country's steel imports have plunged by almost 80% to 8.7 mmt. Some other economies with rapidly growing capacity are also posting rapid export growth, though from much lower levels. These changes concerning China's steel exports and imports pose a significant trade-related challenge for many OECD and other market-oriented economies, as their exports declined while imports surged. Since 2020, steel imports increased by around 13% in the European Union and the United Kingdom, 18% in Japan and Korea, 40% in North America, 52% in Türkiye, 60% in South America, and by as much as 77% in Oceania.

Figure 1.5. Steel export volumes (2024) and growth (2020-24) in selected countries



Source: OECD, based on COMTRADE and ISSB.

The trade-related challenges of excess capacity go beyond the direct effects in importing markets – where imports from sources of excess capacity can significantly displace domestic steel production and reduce opportunities for exporters from countries that are not the source of excess capacity – and can involve harmful indirect effects across many OECD countries. For example, exports from China also surge to third markets, some of which are also grappling with growing excess capacity, such as Northern Africa, the Middle East and Southeast Asia, which in turn increase their exports, particularly to OECD countries,

because their domestic markets are saturated with surplus steel. These trade disruptions lead to increased trade actions that target not only the direct sources of excess capacity but also broader trade measures due to the harmful indirect effects occurring across markets.

Reflecting these challenges, trade actions have multiplied. In 2024, 81 antidumping investigations involving steel products were initiated by 19 governments, taking the level of trade actions to a level near that observed during the steel crisis of 2015-16. Almost 80% of the cases were filed against Asian producers, with China alone accounting for more than one-third of the total. The number of new cases was up sharply from 2023 when only 16 cases were initiated by five countries for the entire year. In addition to the product-specific dumping cases, a growing number of countries have introduced broader measures to protect their steel industries through sector-wide blanket increases in steel tariffs.

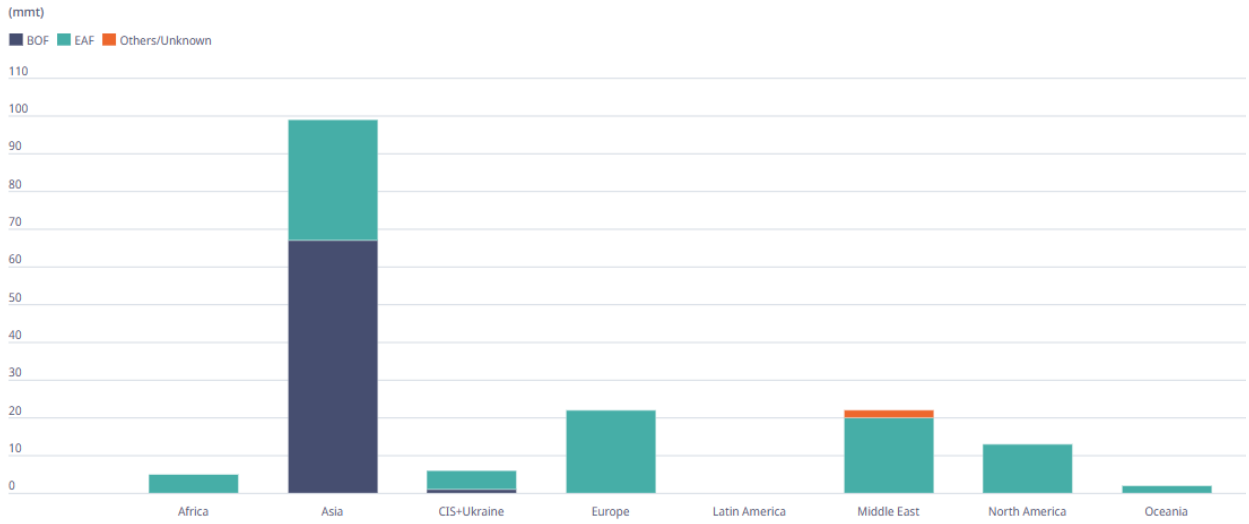
While trade actions are on the rise, the effectiveness of these measures may be limited as exporters circumvent those measures or transform the excess capacity of steel into downstream products containing steel. OECD research shows that indirect steel exports to OECD and other market-oriented economies are growing rapidly, sourced mainly from China, South Asia and the ASEAN region. Identifying the source of the steel excess capacity that is driving these trends can be complicated, however. For example, Chinese steel companies that have invested heavily in new steel plants in the ASEAN region may produce steel for local downstream manufacturing.[3] ASEAN countries will then export the metal products, electrical equipment, machines, cars and domestic appliances made from that steel to trading partners in Asia and beyond.

Market imbalances are slowing the industry's decarbonisation efforts

Steel is a carbon-intensive industry with direct emissions accounting for approximately 8% of global carbon dioxide (CO_2) emissions. On average, 1.9 tonnes of CO_2 are emitted per tonne of steel produced. BF-BOF production, which relies largely on coking coal and iron ore to produce steel, emits 2.3 tonnes, while scrap-intensive electric arc furnace (EAF) production emits 0.7 tonnes on average. Reducing emissions is thus a fundamental structural challenge the industry needs to address. However, the transition of steelmaking assets towards low-carbon production methods is taking place in a context where the industry is affected by other major structural challenges linked to excess capacity and related market distortions.

Much of the current excess capacity and future capacity growth sits in countries that rely on integrated steel production processes that generate relatively high levels of carbon emissions. For example, over 90% of China's steel production is based on the BF-BOF production route. Moreover, slightly more than 40% of the 165 mmt of new capacity entering the market during 2025-27 is expected to be based on the BF/BOF process (Figure 1.6). By extending the life of emission-intensive assets beyond what is dictated by market forces and stifling investment, the current surge of excess capacity creates a barrier to deploying breakthrough technologies, including hydrogen-based steel production solutions, that would help countries reach their climate goals.

Figure 1.6. Projected steelmaking capacity increase from 2025 onward, by technology and region



Note: The capacity data contain both underway and planned projects and do not take into account possible closures that may occur during the period. BOF: Basic oxygen furnace; EAF: Electric arc furnace.
Source: Metal Expert, Platts, Kallanish, and steel company websites.

The magnitude and scope of decarbonisation efforts depend on the availability of capital and the impact of the decarbonisation efforts on costs. The ongoing excess-capacity-related market difficulties that reduce the steel industry's profitability and capital available for investment create a barrier to costly decarbonisation efforts. Even if governments were to support the cost burden of the transition and thriving markets for low-carbon steel eventually emerge and expand, steelmakers cannot return to sustained, healthy levels of profitability until global excess capacity and its consequences are meaningfully addressed. Industries and governments need to be confident that the new, low-carbon steel plants invested in today will be economically viable over the very long term, given the lifetimes of steel plants that can span a generation or more.

Excess capacity and emissions also have an important export dimension. Market-distorting subsidies that boost excess capacity also encourage production to run at high levels, with the excess production being exported to foreign markets. So long as the excess capacity problem can be exported to other countries without implementing actual closures, it will be difficult to reduce emissions in the steel sector.

Recent OECD Steel Committee work reviews China's extensive support programs to encourage the shift to low-carbon steel production. Although China's policies may encourage a significant shift towards lower-carbon steel production (as is the case for many other countries), subsidies may continue to promote non-market capacity increases and thus result in further excess capacity, which exacerbates the level playing field problems that have negatively impacted the global steel industry for several years already.

Global co-operation is needed for a level playing field in the global steel market

The latest OECD steel capacity and demand projections covered in this report suggest that global excess capacity is expected to continue rising in the coming years, highlighting the importance of accelerating national and international efforts to address the root causes of steel excess capacity and its consequences.

As steel demand has stopped growing in China, the country's share in global steel demand is estimated to decline to around 45% by 2030 as demand continues to rise strongly in other emerging economies, notably in Asia, but also in Africa and the Middle East. Meanwhile, with steel production levels sustained

by government policies in China, the country's export volumes and dominant role on the world market are set to continue unabated towards 2030. Consequently, global excess capacity is set to remain a severe obstacle for a sustainable steel sector. Even with world steel demand estimated to rise by almost 70 mmt towards 2030, a number of new plants are now being constructed that are expected to add 165 mmt of capacity, keeping global excess capacity at high levels.

Without policy reforms in countries that are fuelling the excess capacity or disincentives for them to export their surplus steel either directly or indirectly (in the form of steel-intensive goods), global steel industry problems will intensify. Market imbalances would grow, steel prices and profitability would remain under pressure, and countries would continue to face problems in their steel industry. Without concrete action, this could, over time, further hollow out the steel and some downstream manufacturing sectors across the OECD, threatening economic resilience and security.

The challenges facing the steel industry have an international dimension that can be addressed by governments and the industry working together across borders. The OECD facilitates the Global Forum on Steel Excess Capacity (GFSEC) to consider collective solutions to the challenge of excess capacity and enhance market functioning in the steel sector. To this end, a set of principles (the "Berlin Principles") to guide the development of policy responses was reaffirmed during the GFSEC Ministerial Meeting in October 2024. Following these principles ensures that government policies do not distort markets and contribute to excess capacity in the steel sector.

Enhancing international co-operation to address excess capacity and market distortions will improve the economic viability of the industry and facilitate its efforts to move forward on steel decarbonisation. Enhancing transparency and working towards a level playing field with key steel-producing countries that suffer from excess capacity and/or its consequences will support this process.

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Notes

1. For example, SOEs with more than 50% state ownership receive more than three times the level of below-market borrowings compared to firms with less than 10% state ownership, after adjusting

for size. See Chapter 3 for further details. Please note that the term “partner economies” is used for any group of countries/economies that are not members of the OECD.

2. For the full reports, see the spring and autumn 2024 Steel Market Developments. See DSTI/SC(2024)1/Final at https://one.oecd.org/document/DSTI/SC(2024)1/FINAL/en/pdf and DSTI/SC(2024)13/Final at https://one.oecd.org/document/DSTI/SC(2024)13/FINAL/en/pdf.

3. Some of these cross-border investments may be problematic from a level-playing-field perspective, as seen in countervailing duty cases involving transnational subsidisation. For a specific case involving Chinese preferential financing for stainless steel production capacity in Indonesia, see https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1774.

2 Growing global steel excess capacity threatens the viability of the global steel industry

Excess capacity has weighed heavily on steel markets in recent years, resulting in capacity utilisation rates typically well below the benchmark for a healthy capacity utilisation rate of 80%. Substantial increases in capacity are planned worldwide in the next several years despite only modest global steel demand growth. Asian economies are projected to account for 60% of the new capacity, led by substantial increases in the People's Republic of China ("China"), India and the Association of Southeast Asian Nations. In most regions, the new facilities will be electric furnaces; however, a significant number of new basic oxygen furnace facilities are planned in Asia. Cross-border investment is involved in about 16% of the total tonnage to be added from 2024 onward, with China playing a leading role in such investment. Over 90% of cross-border investments are concentrated in Asia, with the remainder directed towards Africa.

The current situation: Global capacity continues to increase rapidly despite weak demand

Global steelmaking capacity has grown steadily since 2019, in contrast to the decline in world demand for steel during most of this period. Global capacity reached 2 472 million metric tonnes (mmt) in 2024 (Table 2.1). Since 2019, OECD countries have reduced capacity slightly by 0.2%, while partner economies have seen capacity increase by 3.4%. The Chinese steel industry has by far the largest capacity, accounting for 46% of the world's total in 2024. In 2024, the People's Republic of China (hereafter "China") had a comparatively high-capacity utilisation rate as subsidies and exports helped it maintain a higher capacity utilisation rate than foreign competitors.

Table 2.1. Steelmaking capacity, by largest economy, 2020-24

In mmt, % change and % share of total

Region	2020	2021	2022	2023	2024	2024 Annual % change	2024 Share, %
China	1 147.9	1 146.5	1 149.9	1 141.5	1 141.5	0%	46.2%
European Union	205.6	205.6	205.6	205.7	205.7	0%	8.3%
India	142.3	143.9	154.0	161.2	179.5	11.4%	7.3%
United States	113.6	113.9	118.9	119.3	119.3	0%	4.8%
Japan	128.5	122.4	122.4	117.8	117.0	-0.7%	4.7%
Russia	88.8	90.1	90.8	90.8	90.8	0%	3.7%
Korea	81.6	81.6	81.6	81.6	81.6	0%	3.3%
Iran	50.3	54.8	57.4	58.2	59.2	1.7%	2.4%
Türkiye	53.4	54.0	55.2	57.4	59.0	2.8%	2.4%
Brazil	50.9	50.9	50.9	50.9	50.9	0%	2.1%
World total	2 424.4	2 427.4	2 453.8	2 456.3	2 472.1	0.6%	100.0%

Source: OECD desk research based on publicly available information.

The divergence between capacity and demand growth has led to significant market imbalances, which are putting downward pressure on steel prices and the industry's profitability. Compounding these challenging market conditions is the surge in China's steel exports, which jumped to their highest level of 118.2 mmt in 2024, surpassing their previous peak seen during the global steel crisis of 2015-16. The surge in Chinese exports, stemming from the country's excess capacity and its deteriorating steel demand situation, has created significant problems for steel producers worldwide, depressing their utilisation rates and leading to some plant closures and capacity reductions of otherwise efficient steel production.

Regional developments during 2019-24 are presented in Table 2.2. The table shows that capacity increased by 59 mmt (2.5%) over the last six years. By region, Asia – particularly India – and the Middle East, notably Iran, have been key areas of capacity expansion. India alone increased its capacity by 37.3 mmt (26.2%) in the wake of strong domestic steel demand developments. Iran grew its capacity by 10.9 mmt (22.6%). The Association of Southeast Asian Nations (ASEAN) area, North America, and Türkiye have recorded capacity gains ranging from approximately 8-9 mmt since 2019.

In contrast, developed Asian and European Union countries have seen significant capacity reductions since 2019. China has reduced its capacity by 6.7 mmt since 2019 but still adds significantly to excess capacity growth, with a demand decline estimated at 41 mmt during this period.

Table 2.2. World steelmaking capacity, by region, 2019-24

In mmt and change

Region	2019	2020	2021	2022	2023	2024	Change 2019-24 %	Change 2019-24 Qty
Asia	1 630.0	1 636.1	1 632.7	1 646.2	1 643.0	1 660.6	1.9%	30.6
China	1 148.3	1 147.9	1 146.5	1 149.9	1 141.5	1 141.5	-0.6%	-6.8
India	142.2	142.3	143.9	154.0	161.2	179.5	26.2%	37.3
Japan + Korea	210.1	210.1	204.0	204.0	199.4	198.6	-5.5%	-11.5
ASEAN	74.6	78.7	80.4	80.4	82.9	82.9	11.1%	8.3
Other Asia	54.8	57.2	57.9	57.9	58.0	58.1	5.9%	3.2
Europe	279.6	279.7	280.3	281.5	283.7	280.5	0.4%	1.0
European Union (27) and United Kingdom	220.3	217.7	217.7	217.7	217.8	213.0	-3.3%	-7.3
Türkiye	50.7	53.4	54.0	55.2	57.4	59.0	16.4%	8.3
Other Europe	8.6	8.6	8.6	8.6	8.6	8.6	0.0%	0.0
United States, Mexico and Canada	154.2	157.5	157.7	162.8	163.3	163.3	5.9%	9.1
Commonwealth of Independent States and Ukraine	143.4	142.6	143.9	145.0	145.0	145.0	1.1%	1.6
Middle East	80.7	84.1	89.0	92.3	93.9	94.9	17.7%	14.2
Central and South America	73.9	73.4	73.9	73.9	74.2	74.2	0.4%	0.3
Oceania	6.4	6.4	6.4	6.4	6.4	6.4	0.0%	0.0
Africa	44.6	44.7	43.5	45.8	46.9	47.3	5.9%	2.7
Others	0.0	0.0	0.0	0.0	0.0	0.0		0.0
World	2 412.7	2 424.4	2 427.4	2 453.8	2 456.3	2 472.1	2.5%	59.4
World excluding China	1 264.4	1 276.5	1 280.9	1 303.9	1 314.8	1 330.6	5.2%	66.1
OECD	641.9	645.3	640.0	646.3	644.4	640.4	-0.2%	-1.5
Non-OECD	1 770.8	1 779.1	1 787.4	1 807.5	1 811.8	1 831.6	3.4%	60.8

Note: "Qty" denotes quantity in mmt.
Source: OECD desk research based on publicly available information.

The capacity outlook to 2027: Further pressure on excess capacity

Table 2.3 provides estimates of capacity additions through 2027 by region. Investment projects characterised as "underway" are those that are likely to be completed during the projection period; "planned" projects are less certain. Projects underway include those already under construction or for which equipment contracts have been awarded, and a major financial or state commitment has been made. Planned projects, on the other hand, are more uncertain because they are either at the feasibility or early planning stage or have not yet received financial or state backing to the best of the OECD's knowledge.

Table 2.3. Nominal capacity and potential gross capacity additions, by region, 2023-27

In mmt and change

Region	Nominal capacity		(B)/(A) (%)	Potential gross capacity additions, 2025-27 (mmt)			Capacity in 2027e (mmt)		Increase 2027/2024	
	(A) 2023	(B) 2024		(C) Underway	(D) Planned	(C)+(D) Total	Low (B)+(C)	High (B)+(C)+(D)	Low (%)	High (%)
Asia	1 643.0	1 660.6	1.1%	29.8	66.8	96.6	1 690.4	1 757.2	1.8%	5.8%
China	1 141.5	1 141.5	0.0	15.4	31.9	47.3	1 156.9	1 188.8	1.3%	4.1%
India	161.2	179.5	11.4%	9.2	21.2	30.4	188.7	209.9	5.1%	16.9%
Japan + Korea	199.4	198.6	-0.4%	2.5	1.0	3.5	201.1	202.1	1.3%	1.8%
ASEAN	82.9	82.9	0.0	2.7	12.1	14.8	85.6	97.7	3.3%	17.8%
Other Asia	58.0	58.1	0.2%	0.0	0.6	0.6	58.1	58.7	0.0%	1.0%
Europe	283.7	280.5	-1.1%	8	13.8	21.8	288.5	302.3	2.9%	7.8%
European Union (27) and the United Kingdom	217.8	213.0	-2.2%	4.1	4.1	8.2	217.1	221.2	1.9%	3.9%
Türkiye	57.4	59.0	2.8%	0	9.7	9.7	59.0	68.7	0.0%	16.4%
Other Europe	8.6	8.6	0.0	3.9	0	3.9	12.5	12.5	45.4%	45.4%
United States, Mexico and Canada	163.3	163.3	0.0	8.7	3.8	12.5	172.0	175.8	5.3%	7.7%
Commonwealth of Independent States and Ukraine	145.0	145.0	0.0	3.8	2.8	6.6	148.8	151.6	2.6%	4.6%
Middle East	93.9	94.9	1.1%	9.4	12.3	21.7	104.3	116.6	9.9%	22.9%
Central and South America	74.2	74.2	0.0	0	0	0.0	74.2	74.2	0.0%	0.0%
Oceania	6.4	6.4	0.0	1.5	0	1.5	7.9	7.9	23.5%	23.5%
Africa	46.9	47.3	0.9%	2.3	2.2	4.5	49.6	51.8	4.9%	9.5%
Others	0.0	0.0	0	0	0	0.0	0.0	0.0		
World	2 456.3	2 472.1	0.6%	63.5	101.7	165.2	2 535.6	2 637.3	2.6%	6.7%
World excluding China	1 314.8	1 330.6	1.2%	48.1	69.8	117.9	1 378.7	1 448.5	3.6%	8.9%
OECD	644.4	640.4	-0.6%	17.4	18.6	36.0	657.8	676.4	2.7%	5.6%
Non-OECD	1 811.8	1 831.6	1.1%	46.1	83.1	129.2	1 877.7	1 960.8	2.5%	7.1%

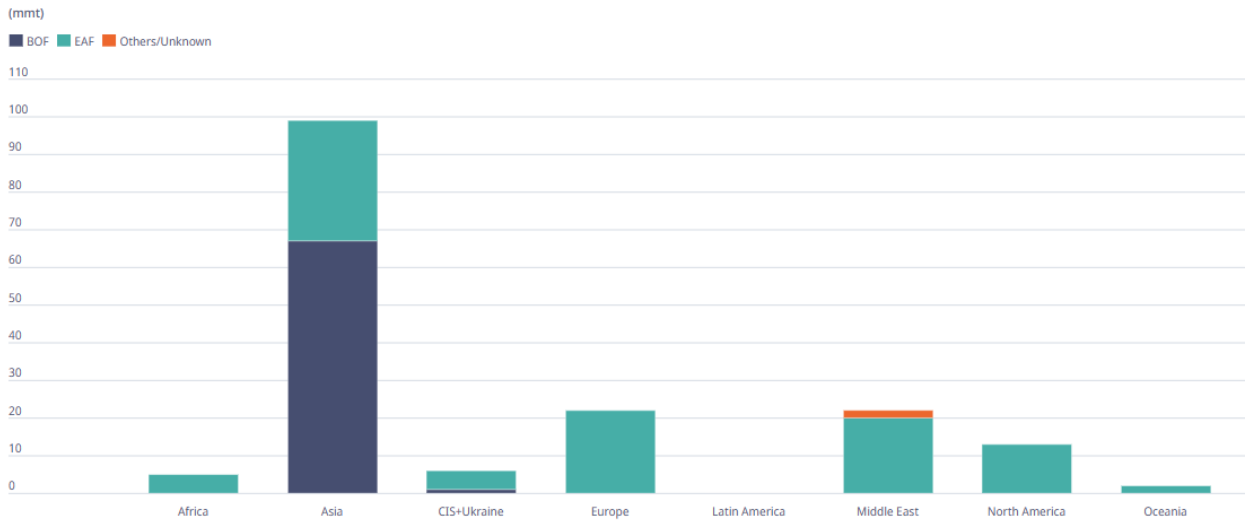
Note: “e” denotes estimate. The capacity data reflect information up to December 2024. “Europe” includes both OECD countries and partner economies. Estimates regarding steelmaking capacity in 2027 and expected percentage changes are based on gross additions only; actual capacity levels will be lower if closures occur during the period.
Source: OECD desk research based on publicly available information.

Information on announced investment projects indicates that 63.5 mmt of gross capacity additions are currently underway worldwide and are therefore expected to come on stream during the next three-year period (2025-27). A further 101.7 mmt of capacity additions are currently in the planning stage for possible commissioning during the same period.

Figure 2.1 shows capacity growth by technology. Of the world total of 165.2 mmt of capacity currently underway or in the planning stages for completion over the next three years, basic oxygen furnace (BOF) projects, which rely largely on coking coal and iron ore to produce steel, account for 40.5% of the total. Electric arc furnace (EAF) projects, which rely on ferrous scrap metal, pig iron, and directly reduced iron to produce steel, account for nearly 60% of the total. The predominance of electric furnace capacity additions will change the profile of the industry, which in 2023 used electric furnaces to produce 28% of crude steel (World Steel Association, 2024[1]).

Figure 2.1. Projected steelmaking capacity increase from 2025 onwards, by technology and region

In mmt



Note: BOF: Basic oxygen furnace; EAF: Electric arc furnace. The capacity data contain both underway and planned projects and do not take into account possible closures that may occur during the period.
Source: OECD desk research based on publicly available information.

When viewed by region, there is a clear difference in the choice between BOF and EAF. BOF construction, which is generally associated with large-scale operations, is concentrated in Asia (China, India, Indonesia, the Philippines, and Viet Nam) and the Commonwealth of Independent States (CIS) (Kazakhstan); no new BOF projects are planned in other regions over the next three years. Factors influencing the choice of production processes include production objectives, the availability and cost of energy and raw materials and the regulatory climate. In this regard, the environmental challenges facing integrated steelmakers (i.e. those using BOFs) are far higher than those of electric furnace operators (OECD, 2023[2]).

Examining capacity developments by region, Asia is projected to see significant increases in steelmaking capacity over the next three years, assuming all ongoing projects are realised and not offset by closures. The region currently has 29.8 mmt (+1.8%) of capacity additions underway for commissioning in 2025-27, with an additional 66.8 mmt (+5.8%) in the planning stage. China and India are projected to account for 80.4% of Asia's steelmaking capacity additions.

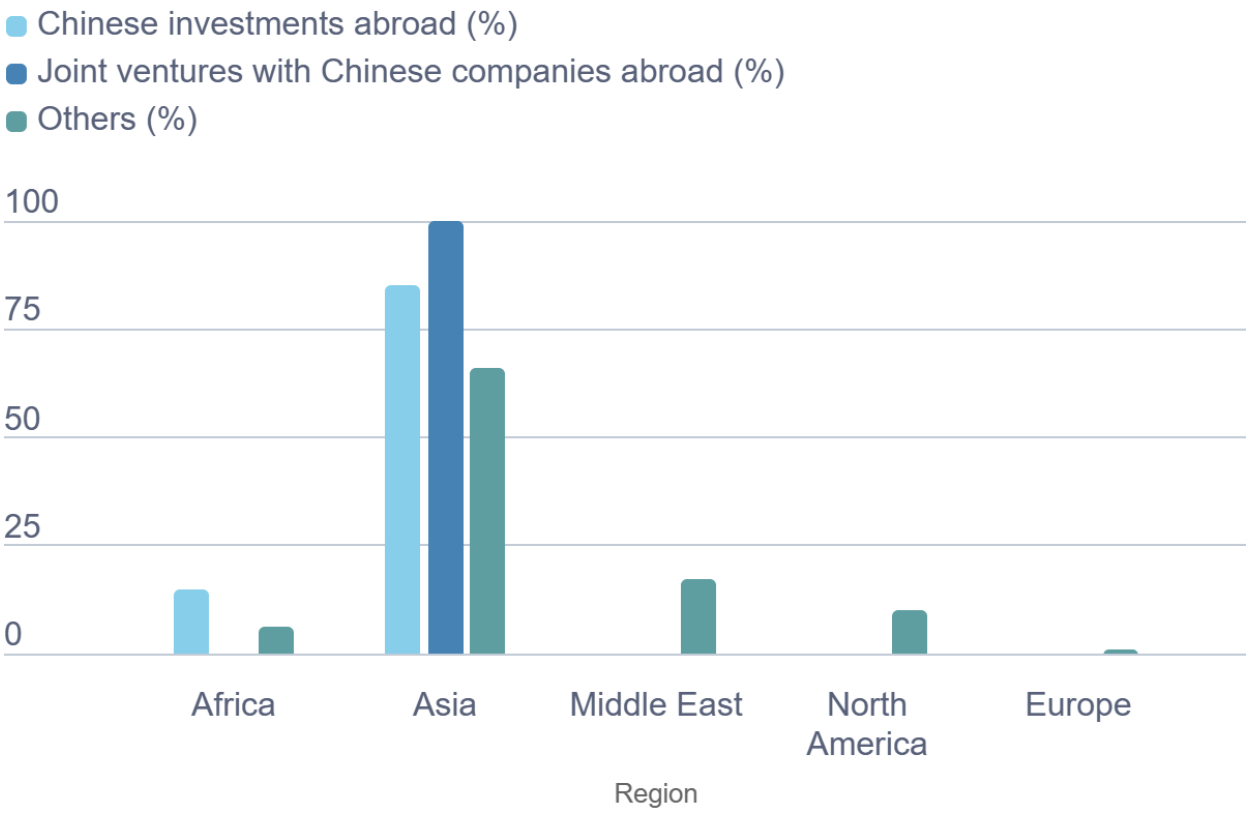
China's capacity replacement policy has encountered challenges, raising questions about achieving planned capacity reductions. Despite efforts since 2018, there have been instances of non-compliance, leading to temporary suspensions of new project approvals, most recently in August 2024. These developments suggest that further efforts may be needed to effectively address capacity reductions in China. With steel demand having already peaked, the potential for continued growth in the gap between domestic demand and capacity could continue to influence the international market.

In other regions, steelmaking capacity additions are projected to increase over the next three years as follows: an increase of 4.5 mmt (+9.5%) in Africa; 6.6 mmt (+4.6%) in the CIS and Ukraine; 12.1 mmt (+5.9%) in the European Union; 21.7 mmt (+22.9%) in the Middle East; 12.5 mmt (+7.7%) in North America; and 1.5 mmt (+23.5%) in Oceania. In Latin America, there are currently no specific ongoing projects to start capacity investments in 2025-27. Some of this growth, particularly across the OECD, reflects a transition to lower-carbon steelmaking and capacity replacements from BOF to EAF steelmaking.

Cross-border investment

Cross-border investment in steelmaking capacity is occurring worldwide, accounting for about 16% of the total tonnage to be added from 2025 onward. China is leading in such investment, accounting for half of the cross-border total, either as a sole investor or through joint ventures (Figure 2.2). More than 90% of the cross-border investment will occur in Asia, with the remainder in Africa. Almost three-quarters of the cross-border investment is being directed towards BOF steelmaking. Among global cross-border investments involving Chinese companies, 65% include at least one state-owned enterprise (SOE). Most of the Chinese cross-border investments to the ASEAN region are associated with government support from the host country (Box 2.1). Furthermore, the average capacity per project for SOE-involved investments is 3.5 mmt, significantly higher than the 1.8 mmt average for private-owned enterprises (POEs), indicating a tendency for larger-scale investments by SOEs.

Figure 2.2. Global cross-border investment in crude steelmaking capacity from 2025 onward, by region and source of investment



Source: OECD desk research based on publicly available information.

Excess capacity is expected to grow further by 2027

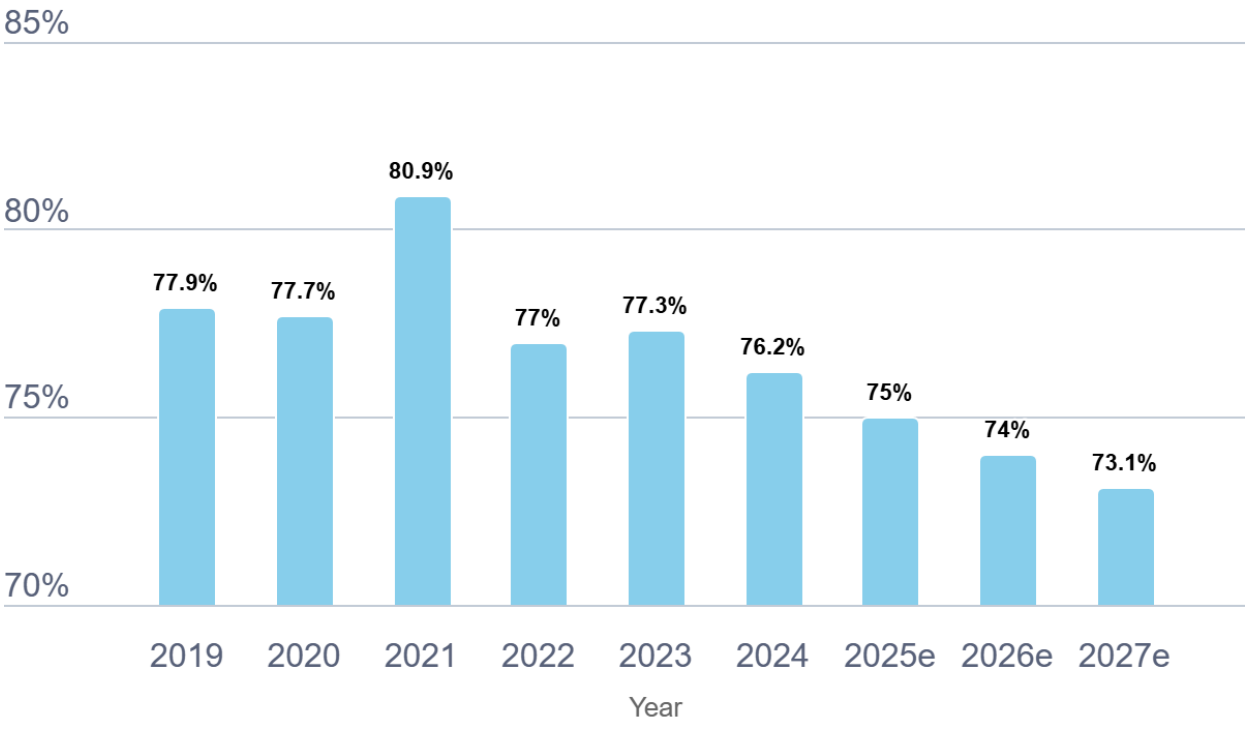
Global excess capacity has risen over the last three years, reaching slightly over 600 mmt in 2024, representing 24% of total capacity. This gap exceeds the steel production of all OECD countries combined by 171 mmt and creates significant risks for the viability of market-oriented steel industries worldwide.

The projected global capacity expansion of 6.7% over the next three years is faster than growth in global steel demand (see Chapter 4). If this capacity expansion is realised, global excess capacity could increase

to 721 mmt by 2027. The widening excess capacity gap would put significant downward pressure on the industry's capacity utilisation rate (Figure 2.3) to 73% by 2027

Given the economies of scale in steel production, utilisation rates this low raise unit production costs. Combined with price pressures stemming from the growing excess capacity levels, this trend would depress steel industry profitability even further from the currently difficult levels.

Figure 2.3. Crude steel production as a percentage of capacity, 2019-27



Note: "e" denotes estimation. Capacity data reflect information up to 2024. All production data are from the World Steel Association.
Source: OECD for crude steelmaking capacity and World Steel Association for crude steel production.

Box 2.1. The Southeast Asian steel industry attracts significant foreign investment

Southeast Asia is a region that has attracted significant foreign investment in new steel plants in recent years, with more capacity coming on stream in the future.

Table 2.4 summarises the foreign investment in capacity expansions, most of which are driven by Chinese companies. In 2013, China launched its "Belt and Road Initiative" (BRI), accompanied by a strategy encouraging Chinese enterprises to "go global" as part of their development and foreign policy agenda (Belt and Road Initiative, 2013[3]). This approach aimed to address China's domestic overcapacity by utilising it to fill production gaps in other countries, presenting itself as a "win-win" solution. The BRI and the "going global" strategy have significantly boosted Chinese investment in ASEAN member states, a trend that intensified with the onset of the US-China trade conflict in 2018. Chapter 3 further details government support measures for capacity expansions in the region.

Table 2.4. Foreign investment in capacity expansion in ASEAN countries

In mmt and USD billions

Country	Firm	Ownership	Type	Capacity	Operation year	Investment	Government support
Chinese investment							
Indonesia	Dexin Steel	Private	BOF	4	2020	4	Tax benefits
		Private	BOF	3	2023		
		Private	BOF	13	(1)	(1)	
Malaysia	Alliance Steel	Private	BOF	3.5	2018	1.6	Tax benefits
		Private	BOF	6.5	2026	1.8	
	Eastern Steel	State-owned (2)	BOF	0.7	2015	(1)	
		Private	BOF	2	2023	1.7	
		Private	BOF	2.3	2027	(1)	
	Wenan Steel	Private	BOF	10	2025	3.3	Tax benefits, lower than market pricing related to land use and others
Philippines	Panhua Group	Private	BOF	12	2026	3.5	Tax benefits
	Baowu Steel	State-owned	BOF	3	(1)	2	(1)
Viet Nam	Yongjin Metal	Private	(1)	0.25	2022	0.1	Tax benefits
		Private	(1)	0.26	2025	0.1	
Other country investment							
Indonesia	Krakatau Steel	State-owned (3)	BOF	3	2013	3	Debt instrument placements, debt forgiveness and debt restructuring
		State-owned	BOF	3	2027	3.5	
		State-owned	BOF	4	2030	(1)	
Viet Nam	Formosa Ha Tinh Steel	Private	BOF	7.5	2017	9.9	Tax benefits, lower than market pricing related to infrastructure and land use

Notes: (1) Not available. (2) In 2015, Hiap teck (Malaysian POEs) owned 55%, and Shougang (Chinese SOEs) owned 40%. In early 2018, Shougang sold its stake in Eastern Steel to Beijing Jianlong, a private Chinese steelmaking company. (3) In 2013, POSCO (Korean POEs) owned 70%, and Krakatau Steel (Indonesian SOEs) owned 30%. In 2022, Krakatau Steel increased its share ownership to 50%. BOF: Basic oxygen furnace.
Source: OECD desk research based on publicly available information.

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3 Steel subsidies fuelling excess capacity

The steel industry is one of the most subsidised industrial sectors, benefiting in particular from preferential loan terms due to its reliance on debt for funding. Subsidies to steel firms have varied significantly over time, with their overall level rising sharply during crisis periods. Within the industry, larger steel firms have been more subsidised than smaller ones, and state-owned enterprises have received more subsidies than other firms. The People's Republic of China's ("China") subsidisation rate is ten times that of OECD countries. Government support for the steel sector has become increasingly prominent in regions where steelmaking capacity is rapidly expanding, such as in the Middle East and North Africa, the Association of Southeast Asian Nations, and China. In addition to government grants and below-market borrowings, measures include subsidised energy prices and preferential tax treatment.

Governments use support measures in the steel industry to influence or dictate the actions taken by firms in a variety of areas, as well as measures influencing competitive conditions in the market. The measures have in the past ranged from advisory guidance to mandatory controls over certain actions taken by firms. Specific interventions have included production and price controls, export restrictions, investment co-ordination and a wide range of subsidies, including: 1) cash grants; 2) below-market borrowing costs; and 3) tax policies that favour the steel sector and/or individual steel firms (Mercier and Giua, 2023[1])

Subsidies to steel industries in OECD countries and partner economies

The key types of subsidies examined here are defined below:

- **Grants** are cash infusions to improve the financial situation of companies or support specific investment projects.
- **Below-market borrowings** (BMB) comprise loans that are provided at better conditions than what the market would offer absent government intervention or government implicit guarantees.
- **Tax concessions** are special provisions for selected firms that lower the taxes that would otherwise be payable.

While the focus of this chapter is on these three categories, due to more readily available data for purposes of analysis and cross-sector comparisons, it should be noted that the steel sector benefits from many other types of subsidies, such as equity infusions inconsistent with market-based conditions, non-market-based equity swaps, government provision of goods and services for less than adequate remuneration, export subsidies, and input support at preferential or non-market rates, including the provision of land, energy and raw materials to steel companies at preferential rates (see Figure 3.1). Those subsidies do not exist in a vacuum but within important and very different national contexts (Mercier and Giua, 2023[1])

Subsidies can have significant effects on competitive conditions in the industry. On the one hand, subsidies received by steel firms can contribute to overinvestment in production capacity while generating significant market and trade distortions. Moreover, subsidies can provide support that would enable firms to maintain production at high levels even when markets weaken. Such subsidies can thus contribute to price declines, discourage the exit of inefficient firms from the market and otherwise disadvantage non-subsidised firms. Subsidies can, as indicated above, also lead to higher levels of investment and capacity expansion that is not in line with market conditions, thus exacerbating the problem of global excess capacity (OECD, 2024[2])

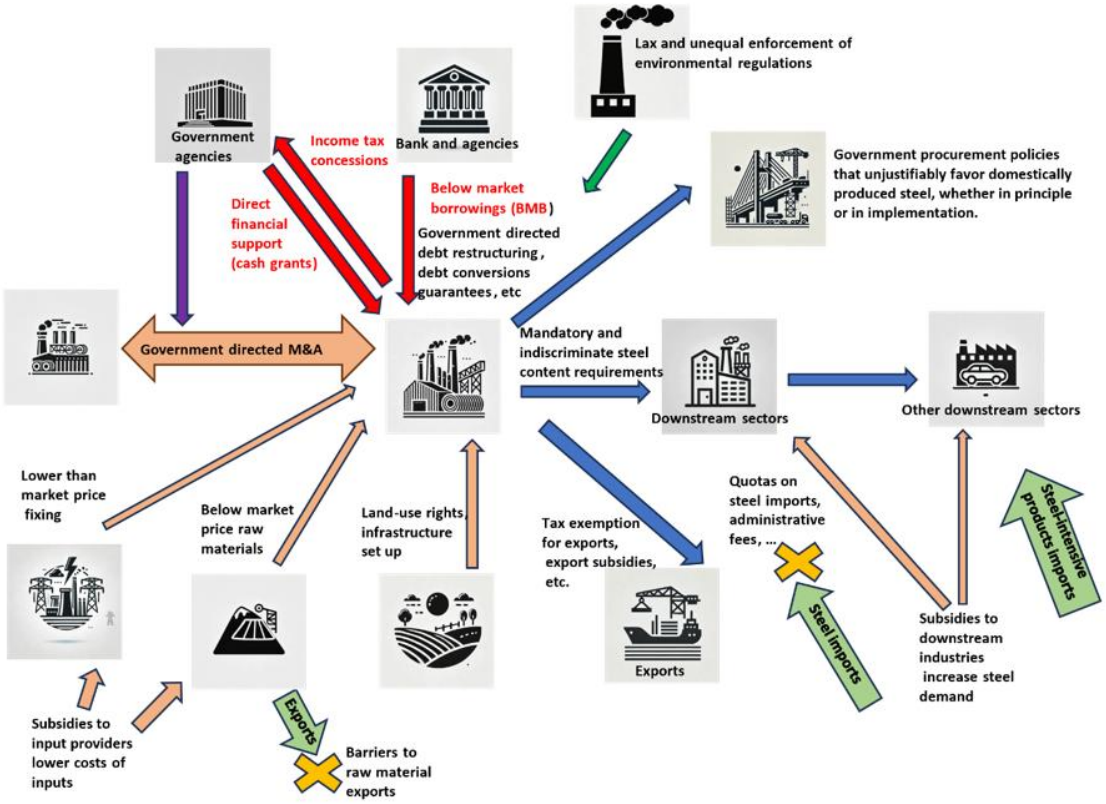
On the other hand, subsidies and government interventions can help to address market failures such as those stemming from high barriers to exit, environmental externalities and research and development (R&D) spillovers. Steel firms that want to shut down a plant may be discouraged from doing so if closure costs are high, which is often the case with respect to steel plants (Rimini et al., 2020[3])

Furthermore, subsidies to support investment and innovation in green technologies can counter the negative externalities arising from pollution and intensive energy consumption. There is, however, some evidence that green subsidies may have the opposite effect by enabling obsolete capacity to continue operating, thereby resulting in higher overall carbon dioxide (CO_2) emissions (Garsous, Smith and Bourny, 2023[4])

Moreover, there is evidence that well-designed R&D tax credits and subsidies can be effective in stimulating R&D and innovation, and that skill and knowledge transfer policies are key complementary instruments (Criscuolo et al., 2022[5]). They can be distortive in some cases, however, particularly when they boost competitiveness and disadvantage foreign competitors.

Figure 3.1. Typical subsidies to steel firms: A multitude of instruments with different impacts

Only the transfers in red, namely cash grants, BMB and income tax concessions (to some extent), are captured in the data used



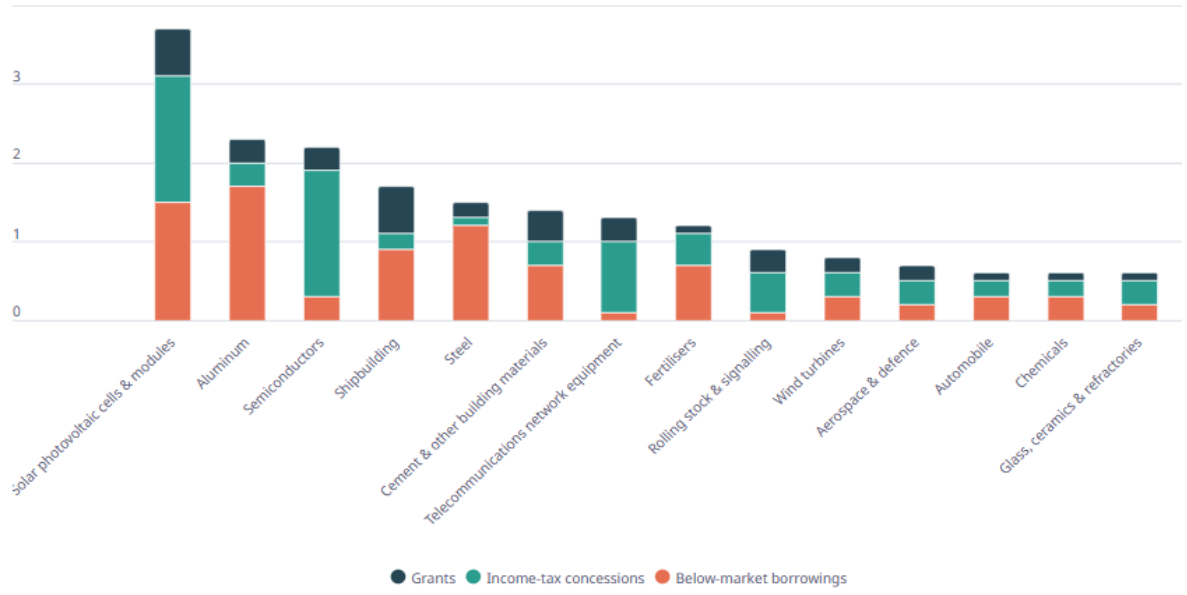
Note: M&A denotes mergers and acquisitions.
Source: OECD steel secretariat desk reseach

Recent OECD analysis of subsidies reveals that the steel industry is a relatively large recipient of subsidies (OECD, 2025[6]). The sector is comparable in this regard to other heavy industries, such as aluminium, cement and shipbuilding (Figure 3.2). BMB is extensive in the steel industry, both as a share of steel subsidies and in comparison, to other industries. However, the evidence of subsidisation is not based only on OECD work but is confirmed by the numerous countervailing duty measures in place in the steel sector.

The subsidies provided to steel have varied significantly over time, with their overall level rising sharply during crisis periods, spurred by increases in BMB (Figure 3.3). The two last major steel crises occurred during the 2008-09 global financial crisis and the 2015-16 steel crisis, when global excess capacity peaked, and market conditions deteriorated significantly. Both crises were characterised by sharp declines in global and domestic steel demand, leaving steel companies in financial distress. In both instances, BMB was used extensively to channel subsidies to steel firms. The reliance on BMB could reflect the speed at which the aid could be deployed by lending institutions, as these institutions usually already have established lending relationships with concerned steel firms, have an interest in avoiding their bankruptcy, and do not require any specific framework to provide BMB to their client steel firms.

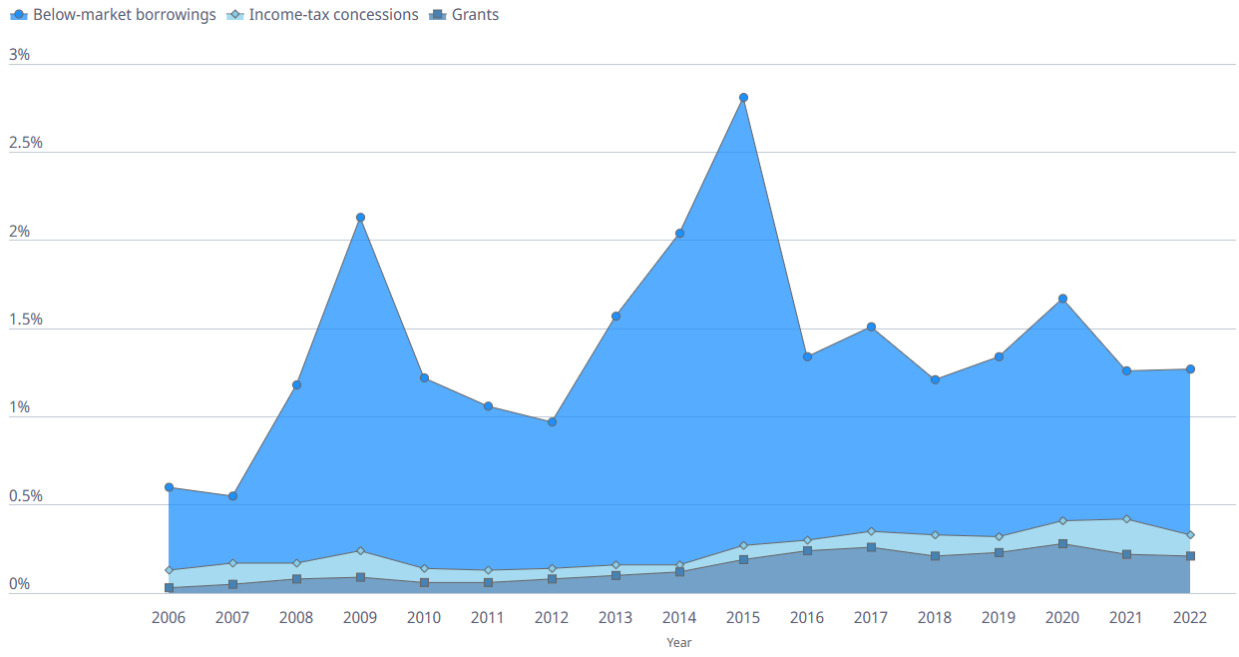
Figure 3.2. Industrial subsidies by sector, 2005-22

Percentage of annual firm revenue



Note: Sector averages use weights based on annual firm revenue.
Source: OECD MAnufacturing Groups and Industrial Corporation (MAGIC) database

Figure 3.3. Steel subsidisation as a percentage of total firm revenue, 2006-22

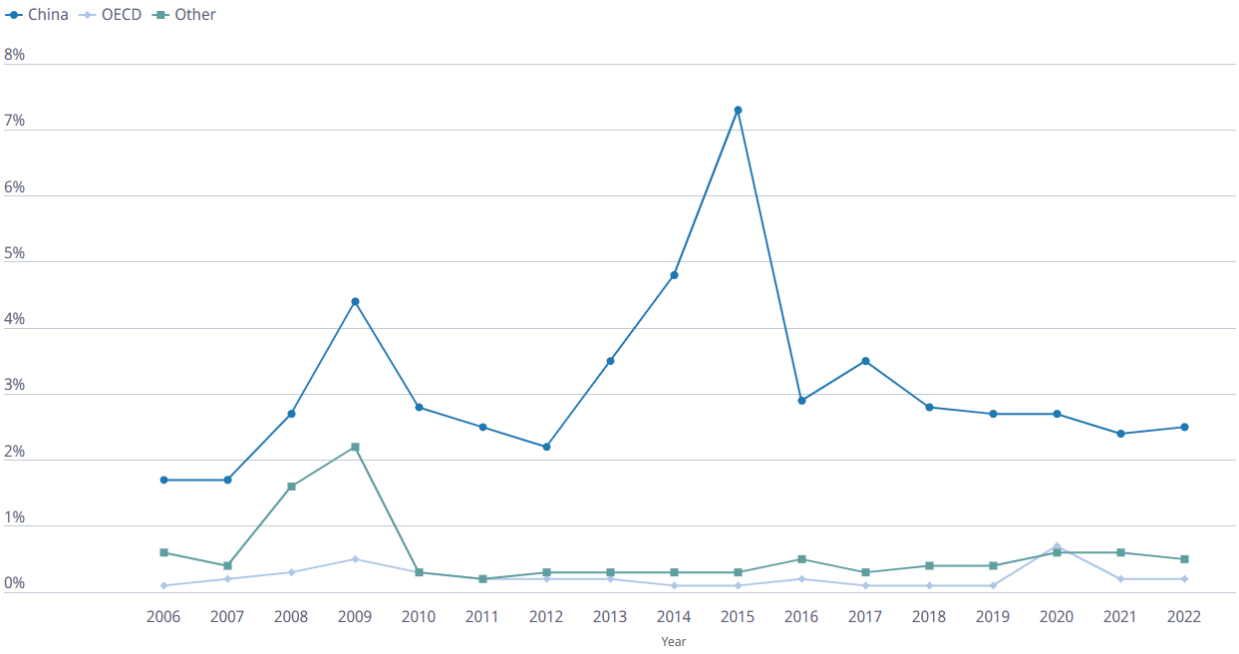


Source: OECD MAnufacturing Groups and Industrial Corporation (MAGIC) database.

The level of subsidisation also differs by country and country groups (Figure 3.4). China's subsidisation rate is five times higher than the average for other partner economies, which, in turn, are double the rate of subsidisation in OECD countries.

Figure 3.4. Steel subsidisation rates in China, OECD countries and other countries, 2006-22

As a percentage of firm revenues



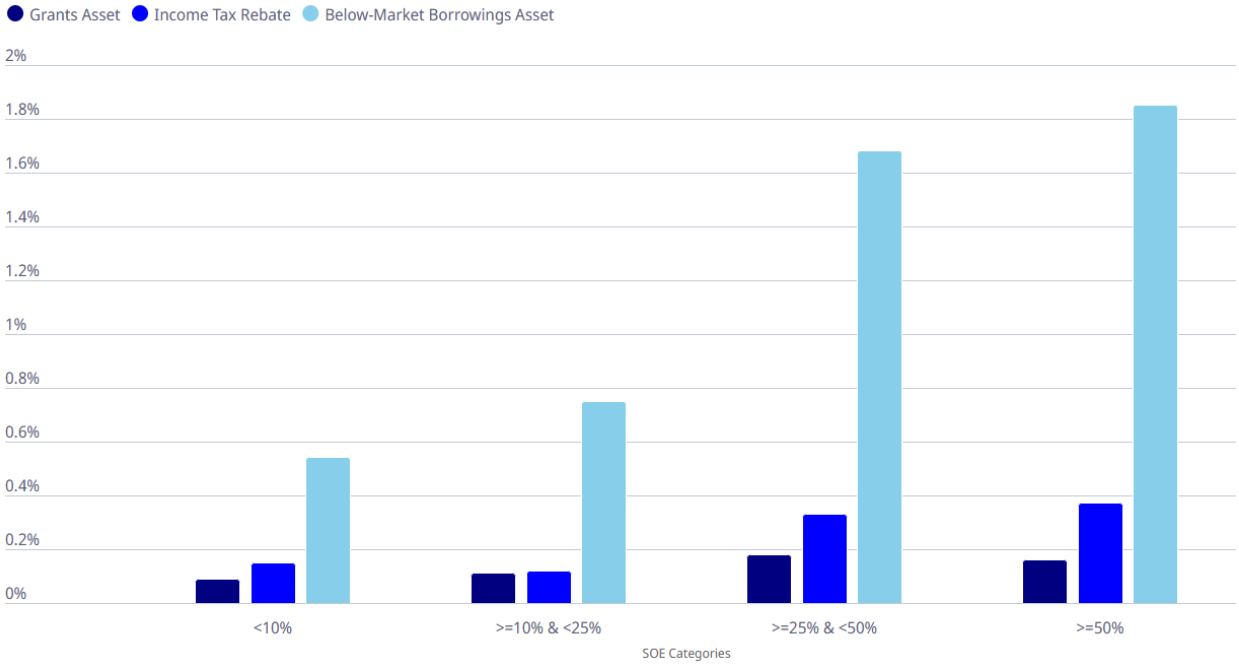
Note: Subsidies indicated in the figure above are the sum of the subsidies entailed in cash grants, below-market borrowings and income tax concessions.
Source: OECD MAnufacturing Groups and Industrial Corporation (MAGIC) database.

Moreover, the distribution of steel subsidies among firms is uneven. Larger firms receive more subsidies per unit of their crude steelmaking capacity than smaller firms. The level of subsidisation is also linked to state ownership in firms (Figure 3.5). Those firms with state ownership equal to or exceeding 25% received more than double the level of subsidies (as a share of assets) as compared to firms with smaller government stakes during 2006-22. When measured in terms of subsidies as a percentage of revenues, state-owned enterprises (SOEs) with 25% or more state ownership received four to six times the level given to firms with lower levels of state ownership.

An OECD econometric analysis of the factors that could be driving subsidisation found, in the case of partner economies, that the level of government ownership in a firm, its size and indebtedness are all positively correlated with grant and BMB subsidies. In the case of OECD countries, the level of government ownership in a firm was found to be positively correlated with BMB, while total revenues were positively correlated with grants.

The OECD analysis finds an overall positive relationship between grants and capacity expansion, with differences between OECD and partner economies. Grants, based on the OECD MAnufacturing Groups and Industrial Corporation (MAGIC) database, significantly affect capacity expansions in partner economies: a grant worth USD 1 million (US dollars) annually sustained over a number of years[1] is associated with an increase of about 5 000 to 10 000 metric tonnes in steel production capacity in partner economies.

Figure 3.5. Steel subsidisation rates by category of state-owned enterprise, 2006-22



Source: OECD MAnufacturing Groups and Industrial Corporation (MAGIC) database.

Government support measures in selected countries and regions

Government supports for the steel sector have become increasingly prominent in regions where steelmaking capacity is rapidly expanding, such as in the Middle East and North Africa (MENA) region, where Iran's steel industry is expanding rapidly, and the ASEAN area and China. These areas are witnessing significant government involvement aimed at fostering industrial growth, safeguarding local producers and enhancing global competitiveness. Through subsidised energy prices, BMB and preferential tax treatment, governments are shaping the future of the steel industry, with implications for both domestic markets and international trade in steel products.

MENA

Algeria

Algeria is currently 30th in global crude steel production and is the 3rd largest producer in the MENA region, with 4.5 million metric tonnes (mmt) of production in 2024. Its rapid growth in crude steel production in recent years far surpasses that of Egypt, Saudi Arabia and the United Arab Emirates. From 2019 to 2023, Algeria's crude steel production surged 83.3%, compared to Egypt's 42.7%, Saudi Arabia's 21.4%, and the United Arab Emirates' 1.4%. Furthermore, Algeria's direct reduced iron production, which is a key ingredient in electric furnace steelmaking, soared by 160.0% over the same period (World Steel Association, n.d.[7])

Support for Algeria's steel industry has been significantly influenced by Decree No. 15-247, issued on 16 September 2015, which sets out specific procedures for the pricing of public utilities, such as water, gas and electricity (Republique Algerienne Democratique et Populaire, 2015[8]). The decree allows the government to offer these services to industries at prices well below even cost recovery levels, effectively providing a substantial subsidy. Under this framework, public contracts are designed to fix prices or

establish mechanisms for setting prices for successive deliveries, creating an environment where steel producers can benefit from significantly reduced energy costs.

This discriminatory pricing structure is, in practice, implemented by Sonatrach, the Algerian SOE that controls the majority of the country's natural gas production and supply. Sonatrach's dominance in the energy sector ensures that natural gas, which accounts for nearly all of the country's electricity generation, is supplied at prices over 90% below cost recovery levels.[2]

This preferential pricing led to an average electricity cost for industrial users of USD 12.46/MWh in 2022, compared to the overall average for residential and commercial users of USD 27.54/MWh (BloomergNEF, 2023[9]). The low energy prices are believed to be an important factor in spurring Algeria's steel production.

Egypt

Egypt is the largest steel producer in Africa and the second largest in the African and Middle East region, producing 10.7 mmt in 2024. In 2023, the country's steel exports surged to USD 2.33 billion, a 65% increase compared to USD 1.41 billion in 2022. Meanwhile, iron and steel imports declined by 18%, dropping from USD 5.1 billion in 2022 to USD 4.2 billion in 2023. This reduction in imports is closely linked to the substantial increase in domestic production capacity, which helped spur a crude steel production rise of 60%, from 6.5 mmt in 2014 to 10.4 mmt in 2023 (Arab Iron and Steel Union, 2024[10]). Government subsidies and various forms of support to domestic producers seem to have been instrumental in this expansion. Energy subsidies, in particular, enabled domestic steel firms to benefit from energy prices well below their market value, thus enabling steel to be produced at a lower cost.

In 2013, the Egyptian government's expenditure on energy subsidies reached 22% of the total government annual budget and 7% of gross domestic product (GDP) (ISSD-GSI, 2014[11]). To put this into perspective, the expenditure for energy subsidies exceeded the combined expenditure on education, health and infrastructure, three sectors that significantly improve a country's sustainable growth prospects. In light of high government deficits, overvalued exchange rates and declining gross international reserves, which resulted in low economic growth, the government decided to gradually phase out the energy subsidies from 2014 until December 2025 (World Bank, 2020[12]). However, due to the coronavirus (COVID-19) pandemic and global and regional challenges, the government reconsidered its position on subsidy policies, deciding to extend the policy indefinitely (Egypt Oil & Gas, 2024[13]). Table 3.1 provides information on the impact of the subsidy for steel during 2019-21. A subsidy amount of EGP 154.5 billion (Egyptian pounds) was announced for 2024/25, the highest value since 2015/16.

Table 3.1. The Egyptian government's intervention on gas prices for the industrial sector in 2019-21

Programme years		Programme description	Gas prices (USD per MMBtu)	
Start	End		For the steel sector	General price
2019	2020	Prime Minister Decision No. 1884 intended to offset the surge in operating costs, bodes for industrial output and export of manufactured goods for the cement, metallurgy and ceramic industries.	5.5	7
2020	2021	Intended to soften the economic impact of COVID-19, Prime Minister Decision No. 744 was designed to benefit all industrial sectors, including steel.	4.5	5.5

Note: MMBtu: Metric Million British thermal unit.
Source: Arab Republic of Egypt (2019[14]); (UNIDO, 2020[15]), DOI available in bibliography.

ASEAN

The ASEAN area is witnessing a rapid expansion in steel production capacity. As of 2024, existing capacity stood at 82.9 mmt, but with new projects, an additional 14.8 mmt could come on line during 2025-27, raising concerns about worsening excess capacity in the region. Government support measures have made it financially attractive for companies to invest in large-scale projects while benefiting from low-cost financing, tax incentives and reduced energy prices. While these measures aim to bolster industrial growth and attract investment, they also contribute to a growing risk of unsustainable excess capacity.

Support for foreign investment in steel production capacity

The ASEAN-6[3] countries are generally optimistic about their future economic growth since their economies are expected to continue being driven by robust private consumption, infrastructure development, tourism recovery, and a rebound in the electronics sector. Declining inflation further supports this outlook. In this context, governments are promoting foreign investment in the steel industry through support measures (see Box 3.1 for further details).

Indonesia

Since 2018, the Indonesian government has exempted corporate income taxes ranging from 50% to 100% for a period ranging from 5 to 20 years for foreign firms that invest at least USD 33 million in the country. This policy supports foreign steel firms, including POSCO and Dexin, in expanding their steelmaking capacity in Java and Sulawesi (SEAISI, 2023[16]).

In addition to encouraging the expansion of steelmaking capacity, the government has implemented supportive fiscal policies to incentivise importing essential raw materials for export-oriented production since 2020. Through these measures, the government seeks to strengthen the industry's resilience and capacity to meet both domestic and international demand. The policies exempt companies from raw materials' import duties and value added tax collection when the finished products are destined for foreign markets while also providing for duty drawbacks when imported raw materials are used in exported products (Direktorat Jenderal Bea dan Cukai, 2023[17])

Support measures for the industry have also included preferential prices for natural gas (ESDM, 2023[18]). Under a 2016 plan, the government provides subsidies for natural gas to the fertiliser, petrochemical, oleochemical, steel, ceramics, glass and rubber gloves industries. The plant gate price for qualifying firms ranges from USD 6 to USD 6.5/MMBtu (Metric Million British thermal unit), while market gas prices range from USD 9.16 to USD 11.99/MMBtu.

The state-owned steel firm Krakatau Steel, the largest steel company in the country, has also benefited from firm-specific government support. Facing financial difficulties, the company restructured its USD 2 billion debt with various creditors in 2019 with the help of government-backed guarantees. State-owned banks held 70% of the debt (The Jakarta Post, 2020[19]). The restructuring cut interest payments to USD 466 million from USD 847 million and was expected to cut costs by around USD 685 million through 2027 (Krakatau Steel, 2024[20])

On 6 October 2020, the government agreed to invest USD 142 million in Krakatau as part of its investment programme (DJKN, 2020[21]). Krakatau issued mandatory convertible bonds with a maturity period of seven years. The company serves as the issuer, with the government as the investor and PT Sarana Multi Infrastructure (Persero) acting as the investment executor under the Ministry of Finance's assignment. Persero manages all the investment processes and assesses the feasibility of projects from financial, legal and economic perspectives. This initiative was implemented to address the significant decline in operational and production activities in the steel sector and user industries.

Malaysia

In Malaysia, direct and indirect tax incentives are provided under the Promotion of Investments Act 1986, the Income Tax Act 1967, the Customs Act 1967, the Excise Act 1976, and the Free Zones Act 1990 (MIDA, 2021[22]). Two types of tax incentives are available (Pioneer Status [PS] and Investment Tax Allowance [ITA]), which are designed to encourage investment and job creation. PS offers a five-year 70% income tax exemption based on specific criteria, like technology use and local employment. ITA allows a 60% allowance on qualifying capital expenditures to be offset against 70% of their statutory income.

Viet Nam

In 2015, the Vietnamese government provided support to the steel industry through tax incentives, import duty exemptions, and land rental subsidies under its Investment Law decree.[4] Steel companies benefit from reduced corporate income tax rates as low as 10%, tax holidays for up to four years and 50% tax reductions for the following nine years (Vietnam Briefing, 2024[23]). Additionally, companies importing machinery and raw materials not produced domestically benefit from import duty exemptions, and those located in special economic zones receive land rental fee exemptions for up to 15 years.

China

Since 2006, Chinese steel firms have been working at shifting their focus from the production of high-volume, commercial-quality products to higher-quality steel, a move supported by the central government and by provinces, in line with nationwide objectives. Financial incentives, including tax breaks, grants and research funding from both central and regional government bodies, have facilitated the transition. The Steel Industry Development Policy that was part of the country's 11th Five-Year Plan (2006-2010) highlighted the importance of technological advancement, innovation and sustainable development in the industry (Gov.cn, 2006[24]). This policy marked a decisive move from mass production towards a more quality-centric approach, reflecting a deepening commitment of the government to upgrading the industry's technological base and product standards. In support of the policy, the government provided financial support to encourage the production of specialised steel types, such as military, bearing, gear, and corrosion-resistant steels, with a view to enhance the quality and technical standards of products and to foster innovation and research within the industry while supporting enterprises to develop R&D programmes.

Although progress was made, steel firms struggled to improve the quality and variety of their steel products. In 2011, only about 30% of the steel products met international advanced levels, and imports continued to play a key role in the supply of high-performance materials (Gov.cn, 2011[25]). The government stepped up its efforts, establishing financial funds to support technological upgrades, modernise production equipment and adopt advanced manufacturing processes. Additionally, the government implemented stricter regulations and quality control measures to ensure that steel products met domestic and international standards.

On the innovation front, the government urged companies to increase their R&D investment to at least 1.5% of their main business revenue, a significant increase from the previous level of 1.1%. This increase was in pursuit of reaching the levels of developed countries, which typically invest around 3% (Gov.cn, 2011[25]).

Under the current five-year plan (2021-2025), the Chinese government is providing financial incentives and support mechanisms focusing primarily on energy efficiency, emission reduction technologies and the development of advanced materials, aligning with the nation's commitment to begin to slow carbon emissions before 2030, with a view to achieving carbon neutrality by 2060 (Gov.cn, 2022[26]). With respect to standards, guidelines have been released aimed at boosting intelligent manufacturing (Gov.cn, 2023[27]). The government also increased fiscal, taxation and financial support aimed at driving industrial value

growth in the steel industry. These programmes focus on achieving a target growth of over 4% industrial value growth in 2024 by supporting high-end, intelligent and green manufacturing (MIIT, 2023[28]).

At the provincial level, governments are providing further support to the industry, tailoring this support to the specific needs in the region. For instance, the Yunnan government is focusing on tackling the issues of excess capacity of steel and high energy consumption (Yunnan Provincial Ecological and Environmental Protection Inspectorate, 2023[29]). In Jiangxi, among other priorities, officials are focusing on boosting the province's R&D investment in the steel sector, as it is comparatively lower than in other provinces (Qingshan Lake District People's Government, 2023[30]); (Department of Economy and Information Technology of Hubei Province, 2023[31]). In Shanxi, the government is trying to address its low steel industry concentration (Low Carbon China, 2023[32]). On the other hand, Jiangsu is confronting challenges related to slow progress in decarbonising the industry and is implementing policies to meet the growing demand for skilled professionals (Jiangsu Government, 2023[33])

The provinces are also paying attention to specific segments of the industry. Zhejiang province, for example, known for structural steel, is focusing on increasing the production capacity and quality in this market segment (Zhejiang Provincial Department of Housing and Urban-Rural Development, 2023[34]). Meanwhile, Hubei and Hunan provinces are advancing the production of steel used in automobiles and appliances, transportation, energy, offshore engineering and shipbuilding (Hubei Government, 2023[35]). In contrast, officials in Jiangxi mandated a reduction in structural steel production by less than 50% by 2026, shifting provincial firms' focus to producing high-quality silicon steel and thick plates (Qingshan Lake District People's Government, 2023[30]). Finally, the government in Anhui financed multiple projects focused on developing and producing high-end stainless-steel products (General Office of the People's Government of Anhui Province, 2023[36])

Box 3.1. Selected Chinese support measures for innovation and product upgrading

Digitalisation and green transition

Chinese provinces are setting significant objectives for 2025 for digitalisation and transition to green technologies. Shanxi aims to achieve over 90% advanced process equipment in its steel production (Shanxi Provincial Department of Industry and Information Technology, 2023[37]). Hunan, Hebei and Jiangxi will upgrade smaller blast furnaces, converters and electric arc furnaces to obtain 80% automation in key processes and 55% digitalisation in production equipment (Hunan Provincial Department of Industry and Information Technology, 2023[38]); (Hebei Government, 2023[39]). Bridging these ambitious goals and their practical implementation, provincial programmes offer substantial support to drive this transformation. For instance, Shaanxi province provided grants of up to CNY 5 million (yuan renminbi) for steel firms that buy advanced equipment and rewarded smart factories, smart workshops, and smart production lines for their innovation (Baoji Hi-Tech Industrial Development Zone, 2023[40]). Steel firms undergoing technological upgrades in Fujian received government support provided in the form of differential electricity prices of up to CNY 20 million (Fujian Provincial Department of Industry and Information Technology, 2023[41])

Substantial reductions in energy and resource consumption are also underway. The government in Henan plans to cut total energy consumption by over 5%, decrease energy intensity by over 15%, lower water consumption intensity by 10%, and utilise 10 mmt of scrap steel annually (Henan Government, 2023[42]). Officials in Hunan are targeting a 14.5% reduction in value added energy consumption compared to 2020, a 57% utilisation rate of industrial solid waste, a 12% decrease in water consumption per unit of industrial added value, and aims to recycle 30 mmt of renewable resources (Hunan Provincial Department of Industry and Information Technology, 2023[38]).Jiangxi's and Shandong's major steel enterprises will ensure that over 30% of their steel production capacity meets energy efficiency

benchmarks and adheres to ultra-low emission standards by 2025 (Qingshan Lake District People's Government, 2023[30]); (Shandong Provincial Department of Industry and Information Technology, 2023[43])

Capacity replacement and capacity relocation

Provincial programmes are also driving a transformative shift in steelmaking capacities to enhance efficiency and environmental sustainability. The government in Henan is targeting the phase-out of blast furnaces below 1 200 cubic metres and converters and electric arc furnaces below 100 tonnes by the end of 2024, transferring the capacity toward the coast (Henan Government, 2023[42]). Officials in Jiangxi aim to increase electric furnace steel output to over 15% of its crude steel production, optimising product structure (Qingshan Lake District People's Government, 2023[30]). Similarly, in Shaanxi and Sichuan, the governments are implementing capacity replacement for smaller blast furnaces, converters and electric furnaces, in line with long-term goals set by the government (Baoji Hi-Tech Industrial Development Zone, 2023[40]); (Sichuan Provincial and Economic and Information Department, 2023[44])

Innovation

Chinese provinces are implementing measures to foster innovation in the steel industry. Officials in Henan are increasing the industry's R&D investment intensity to over 1.5%, aiming for breakthroughs in more than 15 core technologies and enhancing the production of advanced materials (Henan Government, 2023[42]). SOEs in Hebei enjoy preferential policies and large deductions for R&D expenses, with the aim of achieving an annual R&D investment growth of over 10.5% by 2025 (Hebei Government, 2023[39]). Officials in Shaanxi required manufacturing enterprises, including steel firms, to increase their annual R&D investment by 5%, offering up to CNY 5 million in subsidies for acquiring domestic equipment (Baoji Hi-Tech Industrial Development Zone, 2023[40]).

Higher-grade products

Provincial programmes are intensifying their focus on the development of high-value steel products. Officials in Hebei are supporting the production of high--value--added products, such as special alloy steel, high-purity iron and rare earth corrosion-resistant steel, and high-quality plates for automobiles and appliances. They are also encouraging R&D in high-end wire rods and structural steel. To incentivise excellence in these areas, Hebei offers significant support, with national-level manufacturing champions receiving a one-time grant of CNY 2 million (Hebei Government, 2023[39]). Similarly, officials in Hubei are dedicated to optimising the province's steel products structure, setting ambitious targets for special steel to comprise about 70% of the province's total capacity. This includes specific production goals for silicon and bearing steels (Hubei Government, 2023[35]). In Henan, the government has a goal of achieving 50% of its steel production to be high-quality special steel, with over 15% coming from electric furnaces by the end of 2025 (Henan Government, 2023[42]).

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Notes

1. In accounting, a grant tied to an asset will often be reported in the profit and loss statement of the company at an amortised rate similar to the rate of amortisation of the asset. The analysis relies on the OECD MAGIC (MAnufacturing Groups and Industrial Corporations) database, which is a confidential firm-level database combining basic financial and economic data and estimates of government support at the level of each industrial group covered. It is meant to help improve understanding of the scope and scale of government support in manufacturing and to enable analysis of how this support affects firms' decisions and markets. The database covers more than 500 firms of the world's largest manufacturing groups across 15 key industrial sectors (including steel) and over the period 2005-23. For each sector, the firm sample is selected starting from the top firms by revenue or capacity such that the resulting coverage accounts for a sizable, meaningful portion of global sales or capacity. The geographical origin of firms in each sector is therefore largely determined by which jurisdictions occupy relatively large shares of global production. As of 2024, the OECD MAGIC database includes estimates of government support taking the form of governments grants, corporate income-tax concessions, and below-market borrowings.

2. Based on the International Monetary Fund's (IMF) estimates using the Climate Policy Assessment Tool (CPAT)4 developed jointly by the IMF and World Bank (IMF. Middle East and Central Asia Dept., 2024[45]).

3. The ASEAN+6 group comprises the ten countries of the Association of Southeast Asian Nations (ASEAN) and six other countries in the Asia-Pacific region: Australia, China, India, Japan, Korea and New Zealand.

4. Decree No. 118/2015/ND-CP of 12 November 2015. In Viet Nam, land is owned by the state. The government provides rent exemptions, and reductions apply to a number of investment projects that satisfy certain conditions, such as being directed towards the development of sectors or business areas encouraged by the government in specifically determined geographical locations. Foreign companies can enjoy land rent exemptions for at least three years, and up to the whole operation period.

4 Steel market outlook: Slow growth in the medium term

After peaking at a record level in 2021, world steel demand has weakened over the last three years. A sharp decline in demand in the People's Republic of China ("China") largely offset solid steel demand growth in many emerging markets during 2024. In many advanced economies, steel producers experienced slowdowns due to weaker demand, economic uncertainty and high energy costs. As with demand, world steel production reached a record level in 2021, then generally declined through 2024. Growth of slightly less than 1% per year is expected for world steel demand and production through 2030. However, emerging markets, except for China, are expected to see a rebound, driven by infrastructure projects and government-led industrial growth. Steel prices trended lower in 2024, but the rate of decline has slowed, and prices seem to have stabilised recently at their lowest levels since 2021. Steel industry profitability margins are close to historic lows. Profitability is noticeably lower for steel firms in partner economies than for steel firms in OECD countries.

Recent developments

Steel demand and production

Steel is one of the most versatile and widely used materials worldwide. Demand in recent years (as measured by apparent steel use in crude steel equivalent) has been close to 1.9 billion tonnes per year (Table 4.1). The largest single market is for steel used in construction (including infrastructure), which accounts for about 50% of total consumption. Still, hundreds of millions of tonnes are also used to manufacture many types of machinery, equipment and other metal products. Over time, the People's Republic of China (hereafter "China") has emerged as the world's largest country market, accounting for approximately 50% of total demand; small changes in Chinese demand can thus have significant implications for world markets, particularly with respect to international trade flows and prices.

Table 4.1. World crude steel demand by region, 2019-23

In mmt and % change

Region	2019	2020	2021	2022	2023	% change in 2023
Asia	1 314.6	1 373.6	1 359.0	1 328.7	1 318.8	-0.7
China	949.9	1 050.8	994.2	965.3	942.8	-2.3
India	109.0	93.9	113.0	123.9	140.7	13.6
Japan + Korea	125.2	107.2	122.0	114.2	113.3	-0.8
Association of Southeast Asian Nations	90.4	81.2	83.1	83.6	82.4	-1.4
Other Asia	40.1	40.5	46.8	41.6	39.6	-5.0
Europe	208.3	191.1	223.8	207.7	200.1	-3.7
European Union (27) and United Kingdom	172.6	152.0	180.4	165.7	151.7	-8.4
Türkiye	27.8	31.4	35.6	34.6	40.6	17.2
Other Europe	7.9	7.7	7.9	7.4	7.8	5.5
United States, Mexico and Canada	150.4	128.9	153.3	148.2	147.8	-0.2
Commonwealth of Independent States and Ukraine	61.4	60.4	61.7	56.5	62.6	10.8
Middle East	54.8	51.6	55.4	55.4	58.1	4.9
Central and South America	46.4	43.1	56.5	50.4	50.8	0.8
Oceania	7.0	6.5	7.7	7.7	8.0	4.3
Africa	38.5	35.3	38.2	33.9	34.9	3.0
Others	9.0	7.5	6.9	6.5	9.7	48.5
World	1 890.5	1 898.0	1 962.6	1 895.1	1 891.0	-0.2
World excluding China	940.6	847.2	968.5	929.8	948.2	2.0
OECD	490.2	432.4	507.8	476.3	467.9	-1.8
Non-OECD	1 400.3	1 465.6	1 454.8	1 418.8	1 423.0	0.3
Developed	420.7	366.6	430.4	401.3	386.0	-3.8
Emerging	1 469.8	1 531.4	1 532.3	1 493.8	1 504.9	0.7

Source: World Steel Association (2024[1]), *2024 World Steel in Figures*, https://worldsteel.org/wp-content/uploads/World-Steel-in-Figures-2024.pdf.

After peaking at a record level in 2021, steel demand eased during 2022-24. Monthly indicators suggest that many emerging markets experienced solid demand growth during 2024, but that was largely offset by a significant decline in demand in China and slow growth in developed markets.

Similar to demand, world crude steel production has been on a downward trend for several years (Table 4.2). World production reached a record level of 1 963 million metric tonnes (mmt) in 2021 but declined by 3.8% in 2022. A slight increase was recorded in 2023, but further weakening occurred in 2024 as global production declined 0.8%. The Asian region accounted for almost 75% of the world's total steel production, with China alone accounting for over 50% of the total in recent years.

Table 4.2. World crude steel production by region, 2019-24

In mmt and % change

Region	2019	2020	2021	2022	2023	2024	% change in 2024
Asia	1 348.7	1 391.0	1 407.6	1 382.2	1 398.2	1 385.8	-0.9
China	995.4	1 064.8	1 035.2	1 018.0	1 022.5	1 005.1	-1.7
India	111.4	100.3	118.2	125.4	140.8	149.6	6.3
Japan + Korea	170.7	150.3	166.8	155.1	153.7	147.5	-4.0
Association of Southeast Asian Nations	40.1	45.5	52.6	50.6	51.4	55.5	8.0
Other Asia	31.2	30.2	34.8	33.1	29.9	28.1	-6.0
Europe	196.9	180.1	206.0	182.9	170.7	175.3	2.7
European Union (27) and United Kingdom	157.6	139.5	160.2	142.5	132.1	133.7	1.2
Türkiye	33.7	35.8	40.4	35.1	33.7	36.9	9.4
Other Europe	5.5	4.9	5.4	5.2	4.9	4.7	-4.0
United States, Mexico and Canada	119.0	100.5	117.2	111.0	110.0	105.4	-4.2
Commonwealth of Independent States and Ukraine	100.2	99.8	106.7	85.3	89.8	86.1	-4.1
Middle East	46.3	48.1	49.8	54.2	54.2	54.4	0.5
Central and South America	42.3	39.2	46.2	44.6	42.1	42.4	0.6
Oceania	6.2	6.1	6.4	6.2	6.0	5.4	-10.6
Africa	19.2	18.5	22.5	22.8	25.8	26.4	2.6
Others	0.3	0.3	0.3	0.3	1.4	1.7	20.1
World	1 879.0	1 883.6	1 962.8	1 889.5	1 898.2	1 882.9	-0.8
World excluding China	883.6	818.8	927.5	871.6	875.7	877.8	0.2
OECD	487.9	433.2	491.7	451.3	437.9	431.1	-1.6
Non-OECD	1 391.1	1 450.4	1 471.1	1 438.2	1 460.3	1 451.8	-0.6
Developed	435.9	381.6	433.9	399.5	389.4	383.3	-1.6
Emerging	1 443.1	1 502.0	1 528.8	1 490.1	1 508.7	1 499.6	-0.6

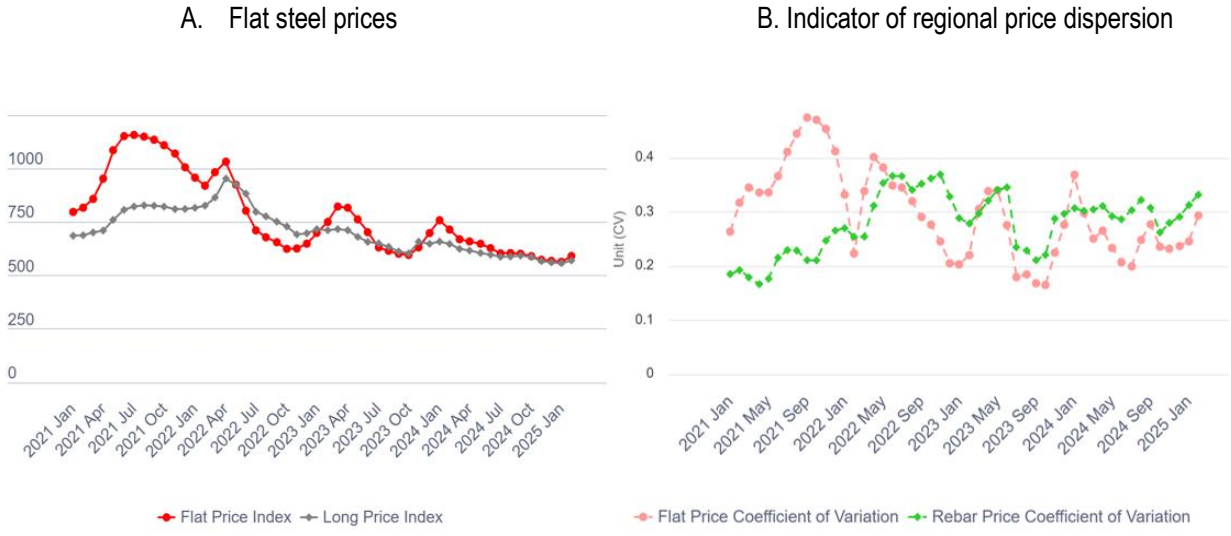
Source: World Steel Association (2024[2]), *Steel Statistical Yearbook*, https://worldsteel.org/wp-content/uploads/Steel-Statistical-Yearbook-2023.pdf.

Developments in steel prices

Flat steel and rebar prices have continued their downward trend that began in July 2021 but appear to have stabilised in early 2025. In February 2025, rebar and flat prices were 12% and 17% lower than one year earlier, respectively (Figure 4.1). This is 31% and 49% lower than their July 2021 peak. Although steel prices were historically elevated during 2021-22, it is noteworthy that steel prices in January 2025 were the lowest they had ever been since 2021.

The coefficients of variation (CV) in Panel B of Figure 4.1 indicate price dispersion across regions. Price dispersion fell significantly towards the end of 2024 as steel prices converged around the globe but started to increase again in 2025. Although wider price dispersion seems to be historically associated with future price increases, during the July 2024 increase in price dispersion, steel prices stayed flat and did not increase.

Figure 4.1. Price indices for flat and long steel categories and their variation, 2021-25



Note: The flat price and long steel price indices are defined as the arithmetic average of the individual regional Platts price series for the United States, North Europe, China, Japan and India, when available. The coefficients of variation (CV) are the ratio of the standard deviation of the regional Platts price series making up the indices to their mean, which captures price dispersion across regions.
Source: S&P Global Commodity Insights, ©2025 by S&P Global Inc.

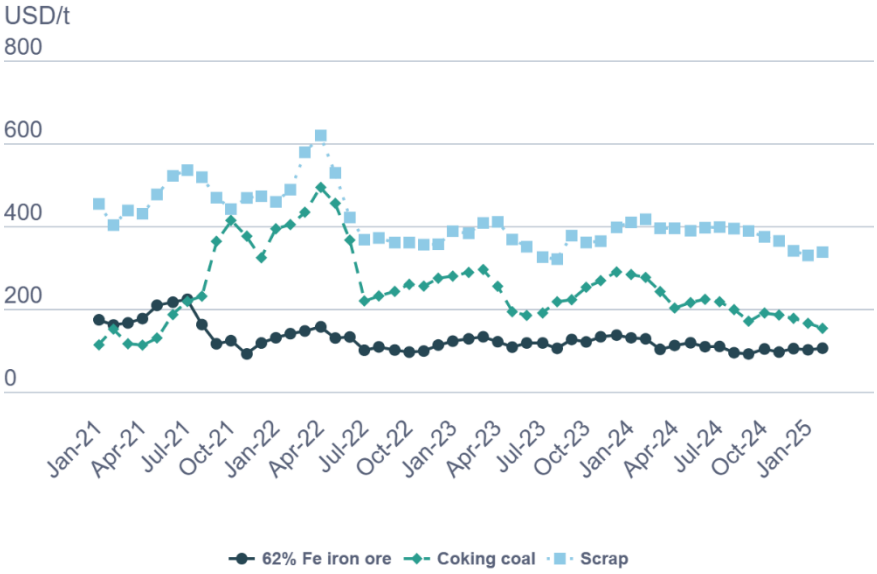
In February 2025, regional flat prices ended up falling between 14% and 21% across all regions, year-on-year, except for Brazil, where the decline was smaller, at 7%. Although US prices have been more volatile than other regional prices, they are in line with other prices in terms of their downward trend, experiencing a 16% decrease in February 2025, year-on-year. Regional rebar prices have dropped between 9% and 15% across all regions. Overall, although price differences between regions remain elevated, the same dynamics seem to have affected all regional prices over the past year.

Steelmaking raw materials prices

The price of a typical basket of raw materials used for steelmaking[1] decreased during 2024, essentially due to a large decline in the price of coking coal (Figure 4.2). In February 2025, prices were, year-on-year, 18% lower for iron ore, 44% lower for coking coal, and 19% lower for scrap.

Figure 4.2. Prices for key steelmaking raw materials, 2021-25

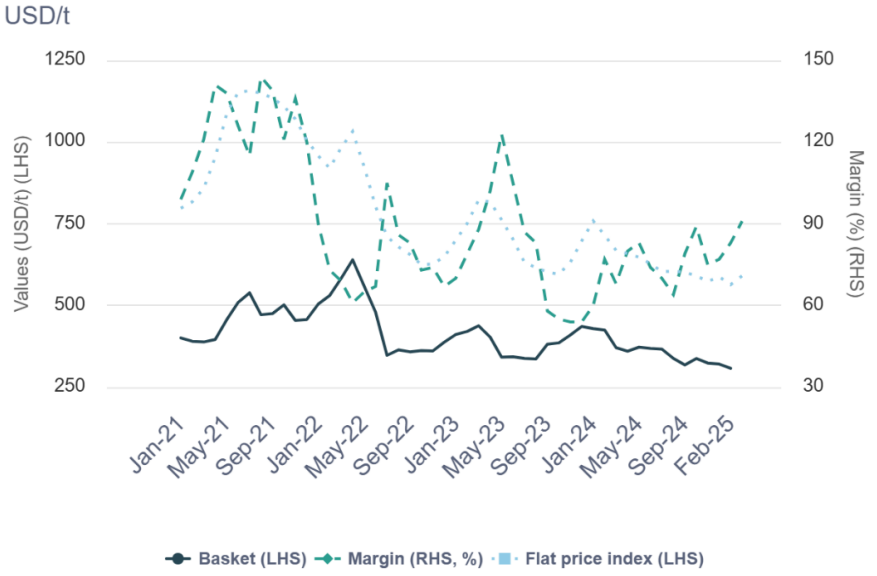
In USD per tonne



Note: The iron ore price series is Platt's "Forwards / SGX 62% Fe Iron Ore cash-settled swaps (dry metric tonne) / China import CFR Tianjin port USD /t"; the coking coal price series is LSEG's "Premium Coking Coal Australia"; the scrap price series is Platts "Scrap / Shredded / N. Europe domestic delivered UDS /t".
Source: S&P Global Commodity Insights, ©2025 by S&P Global Inc; LSEG (2025[3]), London Stock Exchange Group, www.lseg.com.

Consequently, the margin between steel and raw material prices, measured by the difference between the price of steel and the basket of raw materials, has recently been increasing (Figure 4.3).

Figure 4.3. Difference between the price of steel and the basket of raw materials, 2021-25



Note: The last data point is February 2025. Prices used are as follows: Iron ore Fines, 62% Fe, spot, CFR China; Hard coking coal spot, FOB Australia; Scrap, shredded North Europe domestic price. The basket is compared against HRC world prices. The margin is defined as the percentage difference between the steel flat price and the raw materials basket price.
Source: OECD, based on data from S&P Global Commodity Insights, ©2025 by S&P Global Inc. and LSEG (2025[3]), London Stock Exchange Group, www.lseg.com.

As the price of raw materials has fallen quicker than the price of steel products, this will bring some breathing space to previously pressured profitability margins of steel producers.[2]

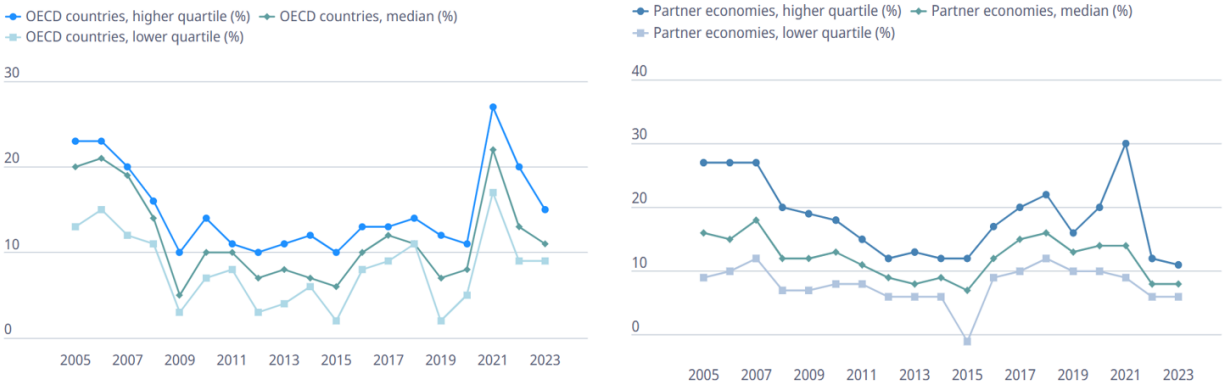
However, material costs, particularly energy costs, have not been uniform across countries. In 2023, electricity prices for energy-intensive industries in the European Union, for example, were nearly double those in the United States and China (IEA, 2024[5]), which were already more elevated than in many other regions. The increasing production expenses in Europe put downward pressure on steel producers, manufacturing activity and, consequently, steel demand. In contrast, economies with more stable or lower energy prices, like those in Asia, have continued to maintain a more favourable environment for their steel industries.

High energy prices in the European Union have fuelled higher inflation, which in turn prompted the European Central Bank to raise interest rates (European Central Bank, 2024[6]). These elevated interest rates have significantly dampened demand in steel-intensive sectors such as construction and automotive, as higher borrowing costs made it more expensive to finance new projects. While energy prices have since moderated in 2024, interest rates have remained elevated for an extended period, prolonging the negative impact on demand.

Financial situation in the steel industry

Profitability of a representative sample of steelmakers fell significantly in 2022, as the speculative price swings observed during the pandemic dissipated and then continued to weaken in 2023 for the median firm (Figure 4.4). Indicators of profitability suggest that margins may have declined further in 2024 for the median steel company to levels that are not seen as sustainable for many firms. Profitability is also noticeably lower for steel firms in partner economies than for steel firms in OECD countries, both in terms of gross profit ratios and in terms of earnings before interest, taxes, depreciation, and amortisation (EBITDA) over total sales.

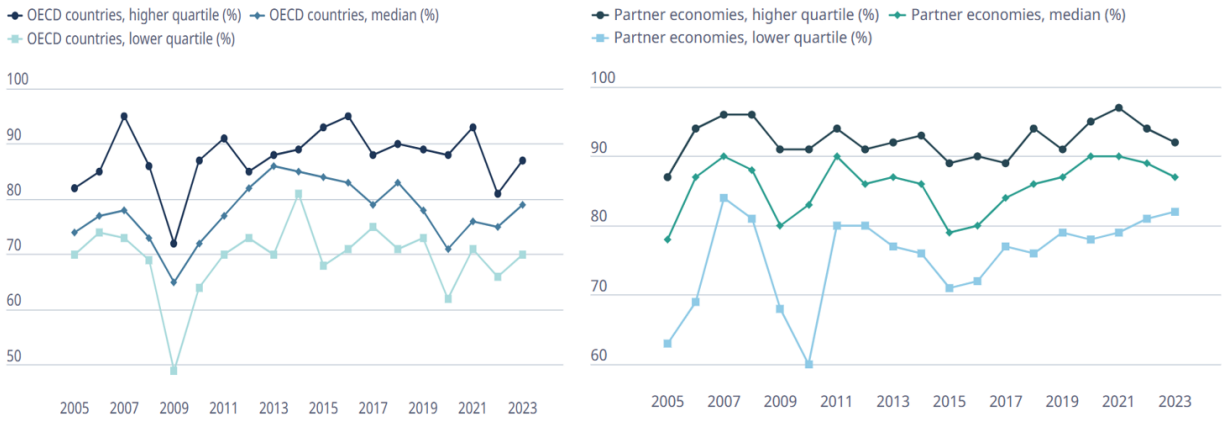
Figure 4.4. Steel industry profitability in OECD countries and partner economies, 2005-23



Note: Operating profitability is defined as EBITDA (earnings before interest, taxes, depreciation, and amortisation) to sales revenue in percentage. The dotted lines provide information on the distribution (first and third quartiles) of the represented values across the firms in the sample: 25% of the companies have a value below (respectively, above) the first (respectively, third) quartile line. The continuous line provides information on median values for firms in the sample: those lines divide the distribution into two halves, with 50% of the companies having operating profitability below the line.
Source: OECD Manufacturing Groups and Industrial Corporation (MAGIC) database.

Data until 2022 show that capacity utilisation in partner economies has not fallen in line with declining profits, which had been the case in 2008-2009. Contrary to the steel firms in OECD countries, capacity utilisation has risen in partner economies despite the declining profit levels (Figure 4.5).

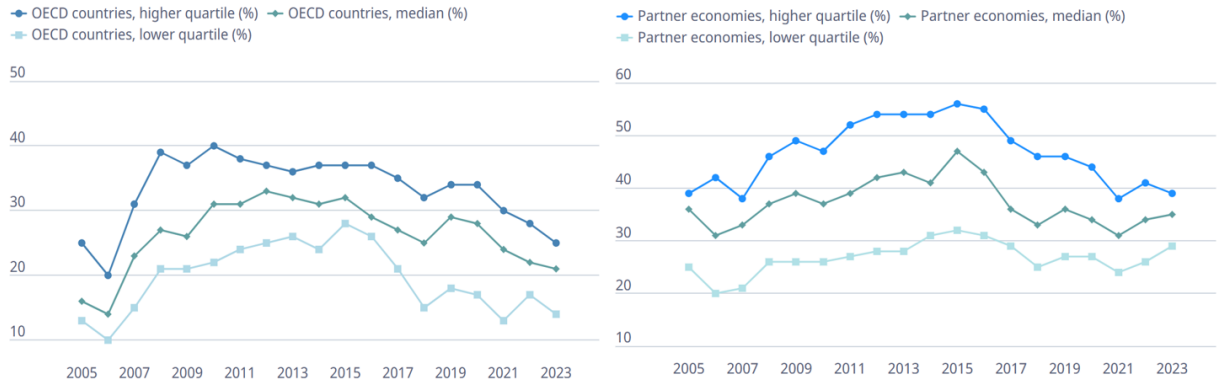
Figure 4.5. Steel industry capacity utilisation in OECD countries and partner economies, 2005-23



Source: OECD Steel Secretariat and worldsteel

Steel firms in partner economies remain much more indebted than in OECD countries (Figure 4.6). The 25% least indebted firms in partner economies (the lower quartile of steel firms in partner economies) are higher than the 25% most indebted firms in OECD countries. As of 2023, the debt-to-asset ratio of steel firms in partner economies had a median of 35%, compared to 21% for steel firms in OECD countries.

Figure 4.6. Indebtedness of crude steel-producing firms in OECD countries and partner economies, 2005-23



Note: Indebtedness is computed as the debt-to-asset ratio; the total liabilities-to-debt ratio would paint a similar picture.
Source: OECD Manufacturing Groups and Industrial Corporation (MAGIC) database.

The sample of firms used in this section is not restricted to publicly listed steel companies and thus presents a relatively accurate picture of indebtedness levels. Nevertheless, some caution is warranted as, in some large steel-producing economies, such as in China, debt has been artificially reduced by relying extensively on debt-for-equity swap schemes that were not agreed upon in advance by investors and lacked clarity concerning losses in cases of bankruptcy.

Global steel demand and production outlook to 2030[3]

Steel demand

Some improvement in global steel demand is expected in 2025 following the contraction of 1.1% in 2024 (Table 4.3). Growth of 1% is expected for 2025, with the level of demand reaching 1 889 mmt in 2025, just slightly lower than 2023. This slight improvement reflects stronger demand prospects across OECD countries and a slower rate of decline in Chinese steel demand. Implementation of stimulus measures by the Chinese government could provide support to the property market there, thereby softening the negative impact of falling new residential investment. However, these stimulus policies are unlikely to be strong enough to reverse the recent decline in Chinese steel demand.

Developed markets, such as the European Union and the United States, are expected to see stronger recovery on the back of a more favourable environment for investment and consumption of durable goods, reflecting lower interest rates and less restrictive monetary policies.

Table 4.3. Steel demand expectations, 2024-30

In mmt and % change

Region	2024	%	2025	%	2030	2025-30, CAGR, %
Asia	1 295	-1.8	1 304	0.6	1 350	0.7
China	909	-3.6	902	-0.8	876	-0.6
India	151	7.2	160	6.0	217	6.3
Japan + Korea	106	-6.2	107	0.7	99	-1.5
Association of Southeast Asian Nations	90	8.7	94	4.7	112	3.7
Other Asia	40	0.4	41	3.5	46	2.1
Europe	197	-1.5	201	1.7	200	0.0
European Union (27) and United Kingdom	150	-1.1	153	1.6	150	-0.3
Türkiye	39	-3.1	40	2.2	42	0.9
Other Europe	8	-0.3	8	1.1	8	0.4
United States, Mexico and Canada	147	-0.7	148	0.6	150	0.3
Commonwealth of Independent States and Ukraine	61	-3.0	62	1.6	70	2.6
Middle East	62	7.0	64	2.6	68	1.3
Central and South America	53	4.5	54	2.1	56	0.5
Oceania	9	9.3	9	0.6	10	1.4
Africa	36	4.3	38	4.9	42	2.1
Others	10	2.4	10	4.9	12	2.1
World	1 870	-1.1	1 889	1.0	1 958	0.7
World excluding China	962	1.4	987	2.7	1 082	1.8
OECD	459	-2.0	464	1.1	459	-0.2
Non-OECD	1 412	-0.8	1 426	1.0	1 507	1.1
Developed	378	-2.1	382	1.0	373	-0.4
Emerging	1 493	-0.8	1 508	1.0	1 592	1.1

Note: CAGR: Compound annual growth rate, 2025-30.
Source: OECD estimates of steel demand derived from its long-term steel demand model, taking into account the Short-Range Outlook published by the World Steel Association (https://worldsteel.org).

The medium-term outlook to 2030 foresees slow growth globally, with global steel demand reaching 1 957 mmt in 2030. While Chinese steel demand is expected to continue declining steadily, the rest of the world is expected to post steady annual growth on average. This projection is based on an expected slowdown in China's gross domestic product (GDP) growth from around 5% in 2024 to 3.1% in 2030 (compound annual growth rate [CAGR] 3.8%).

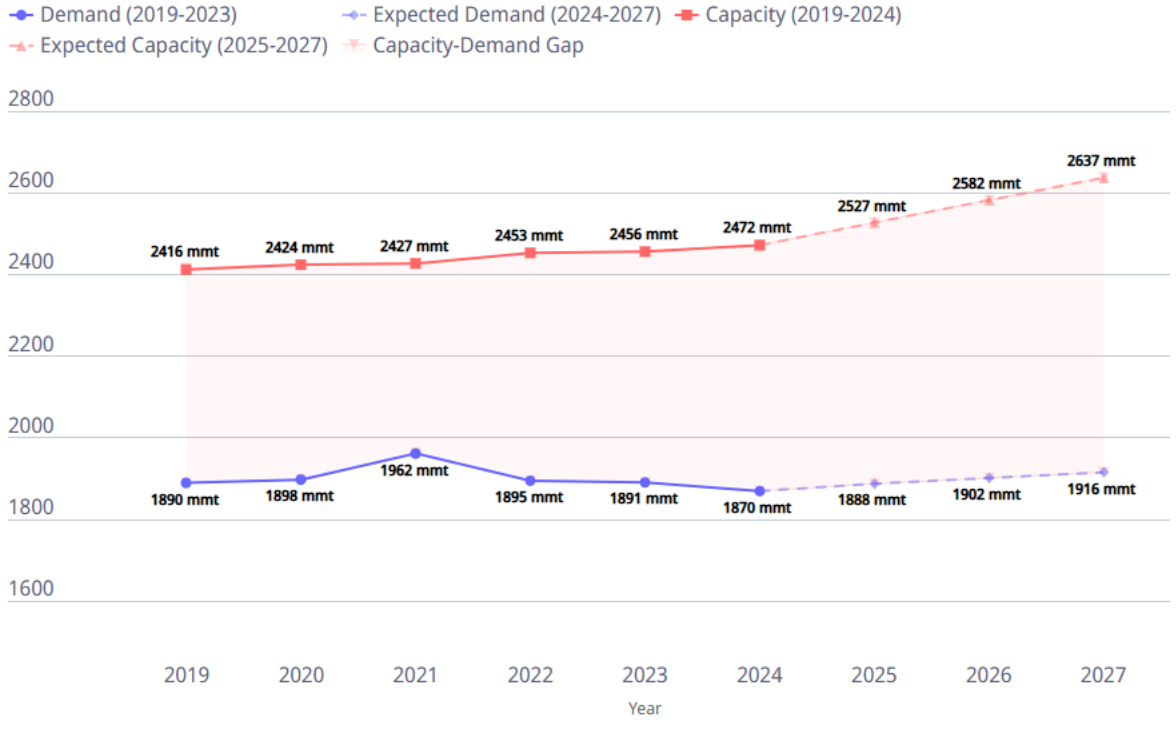
The decline in the demand for Chinese steel reflects expected structural adjustments in the country's growth model, which has been based on high investment rates and relatively low consumption. These structural adjustments in the economy will also reduce the steel intensity of GDP, as economic growth is increasingly driven by household consumption and less by steel-intensive fixed investment. Slower economic growth and the falling steel intensity of GDP are expected to keep Chinese steel demand on a declining path of 0.6% per year, on average, during 2025-30.

Conversely, additional sources of steel demand could come from emerging markets, especially from Asia, such as India and the Association of Southeast Asian Nations (ASEAN) region, which are expected to register strong demand growth, and, to a lesser extent, from the Commonwealth of Independent States, the Middle East and Africa. Steel demand growth in these markets is expected to be led by growing expenditure on infrastructure investment and housing.

Developed markets in Europe, North America (Canada, Mexico and the United States) and Asia are expected to experience modest growth. These are mature markets that will face more limited demand from infrastructure investment and housing.

Figure 4.7 combines the expected demand trajectory until 2027 with steelmaking capacity projections. It highlights that the global excess capacity gap could widen significantly, reaching 721 mmt by 2027.

Figure 4.7. Recent (2019-24) and forecasted (2025-27) global steel excess capacity



Source: OECD desk research for capacity data and demand for OECD estimates of steel demand derived from its long-term steel demand model, taking into account the *Short-Range Outlook* published by the World Steel Association (https://worldsteel.org/).

In fact, current capacity levels would suffice to meet the expected growth in global steel demand for well over a decade into the future.

Steel production

In 2025, global steel production is projected to grow slightly, with a 0.7% increase compared to 2024. China's steel production is expected to decline by 0.6% in 2025, which is a smaller decline compared to steel demand. As such, export pressures will remain high during the year. However, production in developed economies is expected to show positive growth of 1%, supported by the broad-based steel demand recovery. The European Union, the United Kingdom, North America, and developed Asia are expected to experience production growth of around 1%, which will result in a much better overall performance than in 2024.

Global steel production is expected to increase at an average annual rate of 0.9% over the medium term until 2030 (Table 4.4).

Table 4.4. Steel production expectations by region, 2025-30

In mmt and % change

Region	2025	%	2030	2025-30, CAGR, %
Asia	1 392	0.5	1 441	0.7
China	999	-0.6	968	-0.6
India	158	5.7	215	6.3
Japan + Korea	149	1.0	139	-1.4
Association of Southeast Asian Nations	57	3.4	88	8.8
Other Asia	29	3.3	32	2.1
Europe	178	1.3	183	0.5
European Union (27) and the United Kingdom	135	1.1	138	0.4
Türkiye	38	2.3	40	1.3
Other Europe	5	1.3	5	0.0
United States, Mexico and Canada	106	0.7	109	0.5
Commonwealth of Independent States and Ukraine	88	1.6	95	1.7
Middle East	56	2.7	68	4.0
Central and South America	43	1.9	45	0.7
Oceania	5	0.9	7	4.8
Africa	27	3.5	31	2.3
Others				
World	1 896	0.7	1 978	0.9
World excluding China	897	2.1	1 010	2.4
OECD	436	1.1	437	0.0
Non-OECD	1 463	0.8	1 544	1.1
Developed	387	1.0	381	-0.3
Emerging	1 512	0.8	1 599	1.1

Note: CAGR: Compound annual growth rate, 2025-30.
Source: OECD estimates of steel production derived from its long-term steel demand model, taking into account recent production figures from the World Steel Association (https://worldsteel.org/).

The relatively slow growth is primarily due to the gradual decline in production in China, while other emerging markets and developing economies gradually expand their share of world steel production.

Several factors will determine the pace of China's production decline, including whether it can reduce excessive steelmaking capacity, particularly of blast furnace-based plants, to meet climate goals, the extent of the domestic steel demand downturn and how much surplus steel is exported to foreign markets, and whether the oversupply situation and the deterioration of the industry's profitability will incentivise firms to adjust output downwards.

Steel production in the OECD will remain almost constant until 2030, which is in line with market demand fundamentals and given the very limited growth in capacity. In contrast, production growth in Africa, ASEAN, India and the Middle East will play an increasingly prominent role in future global steel production, supported by the ongoing rapid expansion in steelmaking capacity. Some emerging economies aim to be more self-sufficient in steel production and to be able to export steel in the future.

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Notes

1. The raw materials basket for steel production comprises iron ore, coking coal and scrap. Iron ore and coking coal are the main materials used in integrated steelmaking, while purchased scrap is used largely in electric arc furnaces.

2. A word of caution is nevertheless warranted when interpreting the price margin described here. First, it is not region-specific, thus, due to higher raw material and energy costs, some regions will have lower margins. Second, because it does not reflect appropriately all the costs (e.g. labour, capital and electricity costs) incurred by steel firms.

3. OECD projections are based on a new model that leverages the extended OECD Inter-Country Input Output (ICIO) database (OECD, 2023[7]) that considers the perspective of the whole steel global value chain, covering production and international trade flows from 76 countries and 45 industries, with the iron and steel industry as a separate sector. Long-term estimates are built upon OECD's long-term economic projections of GDP, GDP per capita, investment and other series up to 2060, while drawing on structural assumptions and considerations from OECD research.

5 International steel trade: Exports surge from excess capacity

The People's Republic of China's ("China") steel exports to international markets are surging, depressing prices and profitability of steel industries worldwide. China's steel trade surplus surged well above 100 million metric tonnes in 2024, a massive leap over the past five years that is affecting competition across global steel markets. Chinese exports have more than doubled since 2020 and continued to grow substantially in 2024 to their highest level on record. Consequently, the steel crisis has deepened, giving rise to trade tensions and an increasing number of trade measures. A total of 81 antidumping investigations cases were initiated against 21 countries during 2024 alone, up from 16 cases involving five countries in all of 2023.

In recent years, close to 20% of steel production (more than 300 million metric tonnes [mmt] valued at approximately USD 300 billion [US dollars]) has been traded internationally (excluding internal EU-27 trade). As many steel products are price-sensitive, trade volumes can and do shift significantly, in line with changing market conditions. When domestic markets weaken, steelmakers often reduce prices and turn to exports to strengthen their order books, flooding the market with low-priced steel. This can lead to the introduction of trade measures to remedy the injury caused by dumped and/or subsidised imports. In some cases, safeguard measures have been introduced to shield industries when increased imports have resulted in or threatened serious injury. In other cases, national security measures have been introduced.

Steel trade developments

The trade situation in steel is currently tumultuous, as steelmaking capacity is being added in the face of sluggish markets, eventually resulting in significant shifts in trade flows. Global steel exports have risen since 2020, reaching 322 mmt in 2024 – up 9% from 296 mmt in 2020 (Table 5.1). This growth has been largely driven by the People's Republic of China's (hereafter "China") expanding steel trade surplus, which has increased more than seven-fold since 2020. In 2024, Chinese steel exports, driven by a rise in excess capacity, surpassed 118 mmt, marking a 24% year-on-year increase and a dramatic surge over the past five years, disrupting global steel markets.

Table 5.1. Steel exports by region, 2019-24

In thousands of metric tonnes and % change

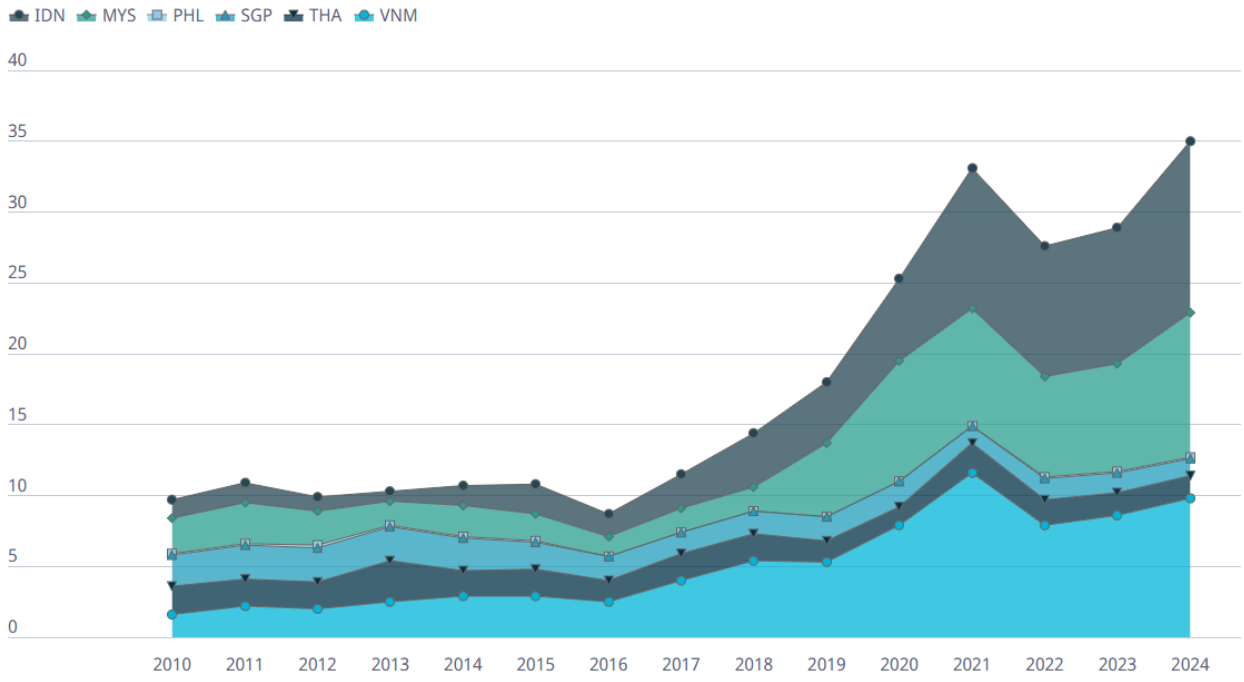
Region	2019	2020	2021	2022	2023	2024	2024-23	2024-20
Asia	99 819	99 954	122 004	109 642	135 215	160 394	18.6%	60.5%
China	64 499	53 816	66 990	69 025	95 161	118 219	24.2%	119.7%
India	13 356	17 297	20 374	12 106	9 866	8 872	-10.1%	-48.7%
Japan and Korea	63 114	59 654	60 546	57 202	59 222	59 200	0.0%	-0.8%
Association of Southeast Asian Nations (ASEAN)	10 004	17 998	23 474	18 253	20 238	24 300	20.1%	35.0%
Other Asia	11 959	10 843	11 165	10 258	9 950	9 004	-9.5%	-17.0%
Europe	60 177	51 113	53 872	46 429	40 848	42 124	3.1%	-17.6%
European Union (27) and United Kingdom	37 686	30 137	29 558	26 513	26 030	23 326	-10.4%	-22.6%
Türkiye	19 742	18 681	22 058	17 568	12 721	17 030	33.9%	-8.8%
Other Europe	2 748	2 295	2 256	2 347	2 097	1 768	-15.7%	-23.0%
United States, Mexico and Canada	18 203	17 060	21 820	21 556	18 816	18 080	-3.9%	6.0%
Commonwealth of Independent States and Ukraine	48 618	47 671	51 843	24 701	17 067	16 619	-2.6%	-65.1%
Middle East	11 417	10 685	12 804	8 461	8 988	3 150	-65.0%	-70.5%
Central and South America	14 271	11 793	13 614	13 435	13 610	11 781	-13.4%	-0.1%
Oceania	1 340	1 106	847	1 370	1 175	1 313	11.7%	18.7%
Africa	4 227	3 814	4 073	3 237	4 564	3 406	-25.4%	-10.7%
World	427 522	396 670	450 637	389 657	400 827	422 683	5.5%	6.6%
World (excluding EU intra trade)	315 425	296 572	333 255	280 406	294 093	322 273	9.6%	8.7%
World (excluding EU intra trade) – China	250 926	242 756	266 265	211 381	198 932	204 054	2.6%	-15.9%
OECD	165 956	150 829	160 283	150 401	142 131	132 891	-6.5%	-11.9%
World – OECD	261 566	245 841	290 353	239 255	258 696	289 792	12.0%	17.9%
Advanced	134 269	120 494	126 710	118 154	117 599	105 829	-10.0%	-12.2%
World - Advanced	293 253	276 176	323 927	271 503	283 228	316 854	11.9%	14.7%

Note: All values are expressed in thousands of metric tonnes. Notably, "EU27" data specifically pertain to external trade. "World" refers to a global aggregate covering more than 75 countries. "World (excluding EU intra trade)" represents a global aggregate that removes EU intra trade.
Source: OECD calculations based on UN COMTRADE and ISSB data.

While China and the Association of Southeast Asian Nations (ASEAN) economies (see Figure 5.1) are leading the global export expansion, Europe, the war-torn Commonwealth of Independent States (CIS)/Ukraine and the Middle East have experienced sharp annual declines. Overall, steel exports from OECD countries have contracted by 12%, whereas those from other economies have grown by 18% since 2020. Chinese exports to all regions have shown significant two-digit increases, with significant growth, particularly to ASEAN and Middle East and North Africa (MENA) countries.

Figure 5.1. ASEAN steel exports, 2010-24

In mmt



Source: OECD calculations based on UN COMTRADE and ISSB data.

At the same time, Asian steel imports have declined over the past four years, driven primarily by the sharp 77% import reduction in China (Table 5.2 and Box 5.1). ASEAN remains the world's largest steel-importing market (56 mmt in 2024), with imports rising by 19% since 2020 and increasing by 10.6% in 2024 alone. Meanwhile, steel imports into Europe and North America have grown significantly. The European Union (excluding intra-EU trade) and the United Kingdom saw a 12.9% increase in imports from 2020, with a year-on-year rise of 4.5% in 2024. North America has experienced an even stronger surge, with imports rising by approximately 40% since 2020.

Table 5.2. Steel imports by region, 2019-24

In thousands of metric tonnes and % change

Region	2019	2020	2021	2022	2023	2024	2024-23	2024-20
Asia	95 677	105 699	100 070	81 990	85 806	89 686	4.5%	-15.2%
China	15 512	38 710	27 825	17 065	11 036	8 717	-21.0%	-77.5%
India	8 931	5 319	5 927	6 897	9 767	10 560	8.1%	98.5%
Japan and Korea	22 818	17 194	19 536	18 997	20 867	20 363	-2.4%	18.4%

Region	2019	2020	2021	2022	2023	2024	2024-23	2024-20
ASEAN	56 898	47 312	48 402	44 837	50 946	56 322	10.6%	19.0%
Other Asia	14 337	14 358	17 916	13 191	14 056	14 087	0.2%	-1.9%
Europe	64 116	55 819	71 531	66 772	63 668	67 184	5.5%	20.4%
European Union (27) and the United Kingdom	48 685	39 977	52 695	48 304	43 172	45 129	4.5%	12.9%
Türkiye	12 358	12 957	16 155	15 831	17 964	19 716	9.8%	52.2%
Other Europe	3 073	2 885	2 681	2 637	2 532	2 339	-7.6%	-18.9%
United States, Mexico and Canada	46 084	37 314	54 461	49 398	52 634	52 081	-1.1%	39.6%
CIS and Ukraine	10 839	8 510	8 507	3 185	2 999	3 264	8.8%	-61.6%
Middle East	22 105	19 511	15 261	16 367	16 653	9 632	-42.2%	-50.6%
Central and South America	14 403	11 731	19 361	15 587	16 168	18 757	16.0%	59.9%
Oceania	2 295	2 200	2 719	2 743	2 765	3 892	40.8%	76.9%
Africa	5 423	4 415	5 974	7 914	8 499	6 318	-25.7%	43.1%
World	427 522	396 670	450 637	389 657	400 827	422 683	5.5%	6.6%
World (excluding EU intra trade)	315 425	296 572	333 255	280 406	294 093	322 273	9.6%	8.7%

Notes: All values are expressed in thousands of metric tonnes. Notably, “EU27” data specifically pertain to external trade. “World” refers to a global aggregate covering more than 75 countries. “World (excluding EU intra trade)” represents a global aggregate that removes EU intra trade.
Source: OECD calculations based on UN COMTRADE and ISSB data.

Box 5.1. The impact of developments in the Chinese steel industry on world markets

China dominates world steel markets, accounting for nearly half of steel demand and production. As a result, changes in the country’s situation, even relatively minor changes, equate to millions of tonnes and can have, and have had, significant implications for foreign markets. Recent developments are a case in point. China’s domestic market has experienced a sharp downturn, with demand falling by an estimated 142 mmt from 2020 to 2024. At the same time, the country’s steel producers have reduced their production by less, i.e. 60 mmt, during this period. Some of their production has undoubtedly replaced imports, falling by about 30 mmt during 2020-24. With a large net shortfall in domestic demand, Chinese producers have diverted their production from domestic to international markets. Slightly more than 118 mmt of steel was exported in 2024, an increase of more than 64 mmt from the 2020 level.

The impact of the increased exports has been experienced in many foreign markets. Chinese steel shipments have surged to ASEAN and other East Asian countries, MENA and Latin America. On the other hand, exports to North America and the European Union appear to have been more stable, though the indirect effects have been significant for some countries. For example, exports from China also surge to third markets, some of which are also grappling with growing excess capacity, such as Northern Africa, the Middle East and Southeast Asia, which in turn have increased their exports, particularly to the European Union and other OECD countries because their own domestic markets are saturated with surplus steel. While all steel product exports from China showed year-on-year increases during 2024, exports are increasingly concentrated in flat-rolled steel, including plates, metallic-coated sheets and strips, and hot-rolled coils. In addition, China’s indirect exports of steel-containing goods have also been increasing significantly to foreign markets.

Steel prices have also been affected by shifts in supply patterns worldwide, led by China’s export surge. An OECD analysis of unit values of China’s steel exports, which can be used as a very rough proxy for prices, reveals substantial declines in 2024. An examination of the 200 most exported HS-6 products from China reveals widespread declines across regions and products, averaging 25% in the first half of 2024, though the decreases have exceeded 50% in some instances. The dispersion of declines is higher in long products than in flat products and steel tubular products.

Steel trade measures in 2024

Steel has been subject to more trade measures than any other product for many decades. The measures have included safeguard actions, duties to address injury caused by dumping, subsidisation and trade circumvention, and national security actions, among others. Antidumping measures have been the most common and have been used in recent years by a growing number of countries.

Trade policy measures

In 2024, a number of countries introduced or reinforced measures to protect their steel industries from increased excess-capacity-driven imports in recent years. Many of these actions originated from countries within the North American region. This area, along with ASEAN countries, experienced some of the most significant reductions in import unit prices from China, exceeding 30% between 2023 and 2024, particularly in flat steel products.

The United States and Canada took direct action against steel and steel-intensive imports from China. As part of the four-year review of actions taken in the Section 301 investigation of China's acts, policies and practices related to technology transfer, intellectual property and innovation, the United States increased tariffs on products in certain strategic sectors, including steel. Section 301 of the Trade Act may be used to respond to unreasonable or discriminatory foreign government acts, policies and practices that burden or restrict US commerce and allows for action to be taken against any good of the foreign country. The tariff increases on steel products underscore the US government's commitment to counteracting excess capacity and excess production by Chinese steel producers. The government of Canada introduced similar tariff actions to shield its steel industry from the adverse effects of low-priced Chinese imports.

Brazil, Mexico, and Türkiye have increased tariff rates with the intent to address substantial import surges experienced in recent years. The significant increases in steel imports have raised concerns about the impact on their local industries.

A significant development in 2024 was the application of US Section 232 tariffs on steel imports from Mexico that are not melted and poured in North America. This action underscored the United States' intent to address the circumvention of Section 232 tariffs. By focusing on the origin of the steel production process, the action aimed to prevent indirect imports from third countries that could undermine existing measures.

A notable development included the introduction by the Korean government of new rules that equip trade defence authorities with the necessary legal framework to investigate the circumvention of antidumping actions. The amendments related to circumvention dumping took effect from 1 January 2025. See Box 5.2 for further information on the challenge of trade circumvention.

South Africa increased import duties on certain steel bars and rods to enhance the competitive position of producers due in part to the significant price disadvantage relative to low-priced imports of similar products from Asia, with exemptions on steel from certain trading partners.

In addition to these measures, border measures to address environmental concerns in the form of fees or tariffs based on the greenhouse gas emissions of a product are receiving increased attention [see Casey, Hite and Ramseur (2024[1])].

Box 5.2. The challenge of steel trade circumvention

Trade remedies in the form of antidumping (AD) and countervailing duties (CVD) are border measures designed to provide redress for dumped and/or subsidised steel that causes injury to steelmakers in an affected country market. Once implemented, the duties can profoundly affect trade, particularly when the AD and CVD margins are high. Some steel exporters seek to circumvent the trade measures by: 1) minor processing, which changes the classification of a product to one that is not subject to the trade remedies; or 2) redirecting their exports to an intermediary country that is not subject to the trade remedy. By circumventing and evading trade measures, exporters attempt to stay ahead of trade remedy duties, frustrating the industry in the importing country that is injured by the unfair trade practices and significantly undermining the effectiveness of the trade remedy measures. This phenomenon is often likened to the game of "whack a mole" and highlights the importance of enforcing trade rules.

Econometric work carried out at the OECD on circumvention involving intermediary countries has focused on identifying suspicious trade patterns that could be linked to circumvention. The research indicates that in 103 out of 152 trade remedy investigations initiated in steel in 2013-18, trade with intermediary countries increased significantly, suggesting possible trade circumvention. The amount of suspicious trade totalled 21.5 mmt (EUR 13.3 billion [euros]) during 2013-20, which represented 17.6% of the total steel trade targeted by antidumping/countervailing duty measures. A large share of the apparent circumvention is linked to trade remedy actions initiated in 2015, at the onset of the most recent steel crisis.

Approximately 65% of the apparent circumvention involved minor modification of products subject to trade remedies in an intermediary country prior to export to the country where the trade remedies were in force. The principal source country was China; the principal intermediary country was Viet Nam.

Note: 1. Suspicious behaviour linked to circumvention is presumed when an increase occurs in exports from a country subject to AD/CVD actions, to a third country, and exports from the third country to the country imposing the AD/CVD measures then suddenly increase.
Source: (OECD, Forthcoming[2]).

Antidumping countervailing duty and safeguard measures in 2024

The number of trade remedy actions has risen close to the high levels seen during the last steel crisis of 2016. In 2024, 81 antidumping investigations involving steel products were initiated by governments (Table 5.3 and Figure 5.2). Almost 80% of the cases were filed against Asian producers, with China alone accounting for more than one-third of the total. The cases were initiated by 19 economies against 21 countries, led by Türkiye and the United States, with 10 each. Hot-rolled flat steel, corrosion-resistant steel and tinplate were commonly targeted products in the investigations. The number of initiations was up sharply from 2023 when only sixteen cases were initiated against five countries for the entire year.[1]

In addition to the antidumping cases, seven countervailing duty cases were initiated during 2024. The United States initiated cases on corrosion-resistant coated steel products from Brazil, Canada, Mexico and Viet Nam, while Australia initiated cases on structural shapes and coil steel from China. Only one case was initiated in 2023; a negative determination was made involving US imports of tin mill products from China. In 2024, the European Union prolonged its safeguard measures on certain steel products and safeguard measures were taken by South Africa, Türkiye and the United Kingdom. Moreover, India initiated a safeguard investigation in 2024.

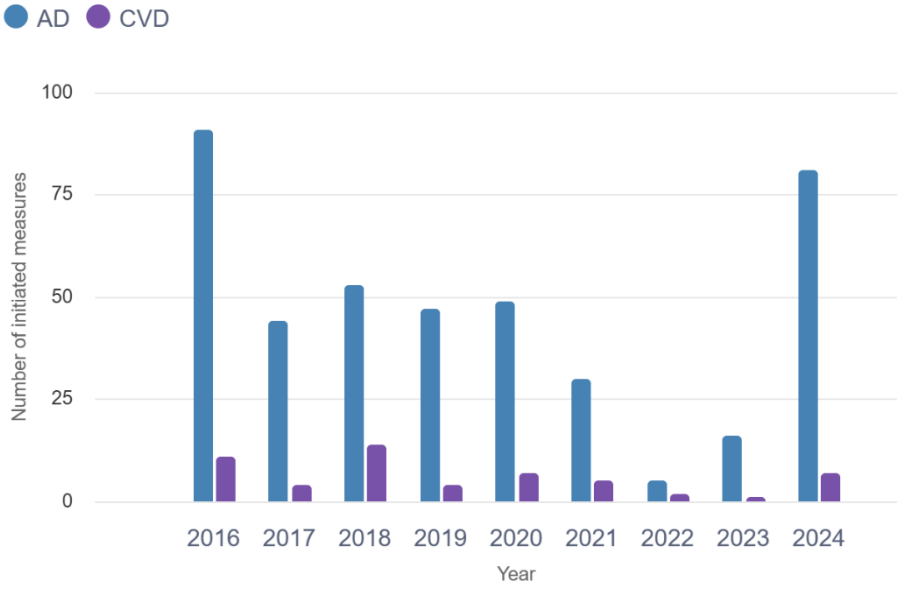
The number of trade remedy cases initiated does not, it should be noted, reflect their final outcomes, as negative determinations can be made following investigation. If positive findings are made, however, they have enduring effects on markets.

Table 5.3. Number of steel antidumping investigations initiated in 2024, by initiating economy

Initiating country	Number of complaints initiated
Türkiye	10
United States	10
Australia	8
Brazil	8
Canada	7
Malaysia	7
EU27	6
South Africa	5
Viet Nam	4
Korea	3
Egypt	2
India	2
Saudi Arabia	2
Thailand	2
Colombia	1
Dominican Republic	1
Guatemala	1
Morocco	1
United Kingdom	1
Total	81

Note: Each defendant country is counted as a separate investigation. For example, if an investigating authority initiates an antidumping investigation concerning a steel product being exported from three different countries, it will be counted as having initiated three separate investigations.
Source: OECD calculations based on Japan Iron and Steel Federation (JISF) data.

Figure 5.2. Antidumping and countervailing duties investigations, 2016-24



Source: OECD calculations based on Japan Iron and Steel Federation (JISF).

Looking ahead to 2025

The structural imbalances in the global steel market imply that recent steel trade trends, with "too much steel searching for too little demand", will continue in 2025. In response, the number of trade measures and other policies to ensure a level playing field and mitigate the economic and social impacts of market-distorting steel imports is expected to increase in 2025. An important development has been the national security action taken by the United States in March when it reinstated a 25% ad valorem tariff under Section 232 of the Trade Expansion Act on steel products imported from all countries. Other recent trade policy developments in early 2025 include the European Union's adjustments to its safeguard measure to preserve its effectiveness in light of negative market developments, including growing excess capacity and related negative effects. Other developments included new antidumping investigations by Peru against China and Mexico against China and Viet Nam, and safeguard measures on steel by India and South Africa (in the form of tariffs).

With global excess capacity expected to continue climbing, a growing number of economies are likely to resort to trade policy measures this year, particularly as the negative impacts of excess capacity spread more broadly across the globe. These developments highlight the need to tackle the root causes of steel excess capacity, i.e. non-market policies and practices, as well as other factors that distort steel trade as revealed in the in-depth work of the OECD in past years, and to continue working on long-lasting solutions in fora such as the Global Forum on Steel Excess Capacity.

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Notes

1. The OECD methodology is such that each defendant country is counted as a separate investigation. For example, if an investigating authority initiates an AD investigation concerning a steel product being exported from three different countries, it will be counted as having initiated three separate investigations. OECD calculations are based on Japan Iron and Steel Federation (JISF) data.

6 Steel decarbonisation efforts challenged by excess capacity

The steel industry has begun to decarbonise through various initiatives, including retrofitting existing facilities, developing low-emission steel plants, integrating biomass in blast furnaces, and investing in carbon capture and storage. However, significant challenges remain, particularly addressing global excess capacity, which has weakened steelmakers' financial performance and their ability to invest in decarbonisation. Investment in low-carbon production should not exacerbate market imbalances. The transition requires vast financial resources and growing markets for low-carbon steel. Key challenges include ensuring high-quality iron ore and scrap availability. OECD analysis shows that the global supply of available external scrap will likely increase sharply in the coming decades. The geographic landscape of iron and steel production is expected to change significantly, with ironmaking potentially shifting to regions with abundant high-grade iron ore and low-cost renewable energy, impacting national decarbonisation goals, socio-economic development and value-added creation.

Steel decarbonisation trends and challenges

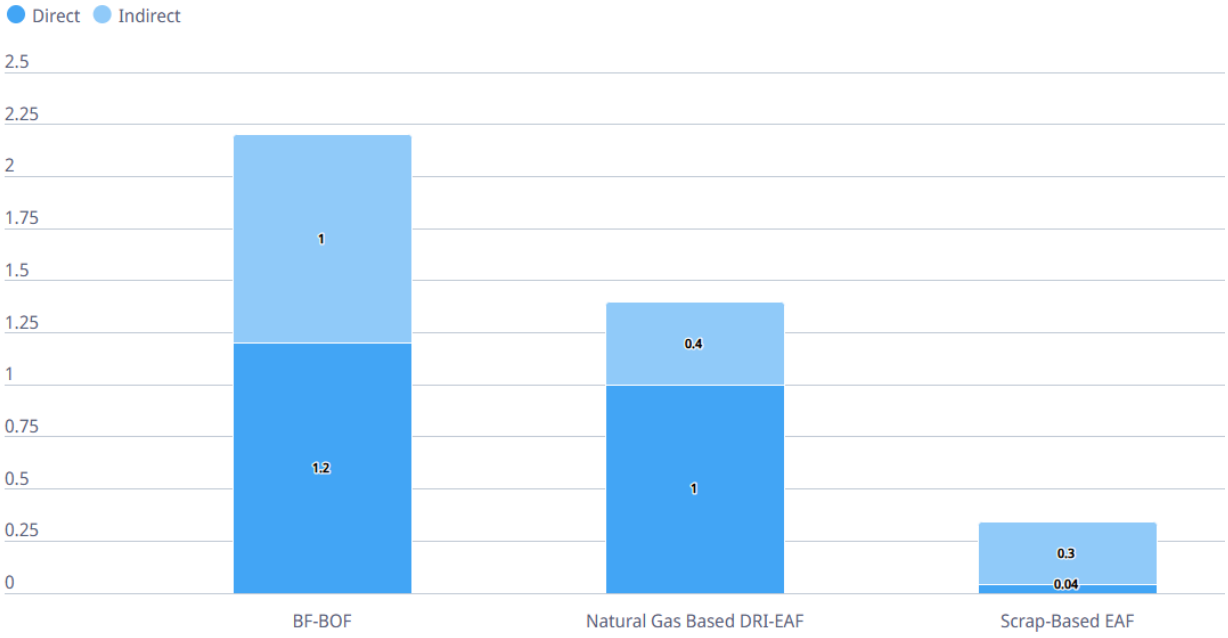
The iron and steel sector accounts for nearly 8% of global carbon dioxide (CO_2) emissions and ranks as one of the highest-emitting industry sectors, accounting for about 30% of total industrial carbon emissions (OECD, 2022[1]).

To meet the Paris Agreement climate objectives, steel industry emissions will need to decrease by 90% from 2020 levels by 2050 (IEA, 2021[2]). Meeting these goals will require profound changes in steelmaking operations. The changes include: 1) enhanced performance through improved energy efficiency; 2) the switching of fuels away from gas and coal; 3) the development and deployment of new technologies to produce steel; 4) material efficiency improvements for increased recycling; and 5) expansion of carbon capture, utilisation and storage (CCUS) efforts. On the demand side, material efficiency and reducing waste through recycling (i.e. circular economy practices) are other factors that would contribute to emission reduction. The complexity of the steel value chain and the heterogeneity in industrial structures provide a variety of decarbonisation pathways (OECD, 2023[3]).

The challenges facing steelmakers differ worldwide, depending on the age of their facilities and the equipment used to produce steel. With respect to the latter, steel produced via the integrated route using blast furnaces and basic oxygen furnaces (BF-BOF) is far more carbon-intensive than steel produced in electric furnaces using recycled ferrous scrap or directly reduced iron (Figure 6.1). Worldwide, steel produced in BOFs accounts for about 70% of total production, with electric furnaces accounting for the balance. However, in some economies, BOF production accounts for 90% or more of production (e.g. the People's Republic of China, [hereafter "China"]). In contrast, in more than 50 countries, steel is produced exclusively in electric furnaces.

Figure 6.1. Average carbon intensities of various steelmaking production routes

In tonnes CO_2 to 1 tonne steel



Note: BF-BOF: Blast furnaces and basic oxygen furnaces; DRI-EAF: Direct reduced iron and electric arc furnaces; EAF: electric arc furnaces. Scope 3 (other emissions linked to a company's upstream and downstream activities) is not covered.
Source: IEA (2020[5]), *Iron and Steel Technology Roadmap*, https://www.iea.org/reports/iron-and-steel-technology-roadmap.

Growing steel excess capacity strongly impacts progress towards steel decarbonisation directly and indirectly. The growth in new capacity in high-emissions production routes such as BOFs adds further emissions to global steel production. As indicated in Chapter 2, BOF construction, which generally is associated with large-scale operations, is concentrated in Asia (China, India, Indonesia, the Philippines, and Viet Nam) and the Commonwealth of Independent States (Kazakhstan); no new BOF projects are planned in other regions over the next three years. Indirectly, excess capacity has a negative impact on steel prices and cost profitability, resulting in an overall weakening of the financial performance of steelmakers and their ability to invest in new plants and equipment for decarbonisation and other purposes.

The efforts to reduce emissions encompass three aspects of the industry. Scope 1 refers to efforts to reduce direct emissions from steelmaking. They include interim technologies for emission reduction that focus on enhancing energy efficiency; these include hydrogen injection into blast furnaces and basic oxygen furnaces. Near-zero emission technologies include CCUS, the production of directly reduced iron using hydrogen, expansion of production in scrap-based electric arc furnaces (EAF) and direct iron electrolysis (IOE), which uses electricity to produce iron. Scope 2 emission reductions refer to shifts in the industry's power supply towards low-carbon energy sources, such as renewable or nuclear energy. Scope 3 reductions refer to all other indirect emissions that occur in the upstream and downstream value chain of a company. Excess capacity risks affecting emission reduction efforts in all three aspects.

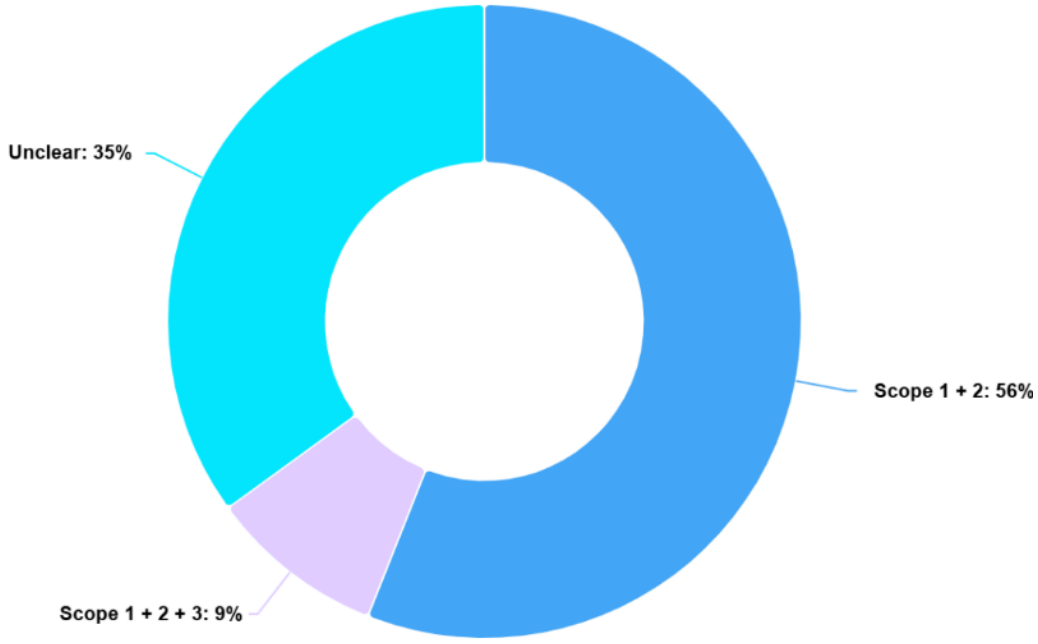
Decarbonisation targets and roadmaps

The OECD has carried out an assessment (OECD, 2024[6]) of the steel industry's decarbonisation plans based on a review of 26 geographically dispersed companies. The companies account for about 40% of world steel production and 33% of world steelmaking capacity.

Most companies in the sample have set decarbonisation targets (88%), with 65% of the companies in the sample having set net-zero targets. Most net-zero targets are for 2050 or later, with two companies having more ambitious goals of reaching net-zero emissions in 2030 and 2045. Some 23% of the companies have not set net-zero targets, instead establishing intermediary emission reduction or emission intensity targets, while 12% of companies, which tend to be the smaller companies in the sample, have not set any decarbonisation targets. As noted earlier, three areas need to be addressed in setting targets: direct emissions (Scope 1); indirect emissions (Scope 2); and other emissions linked to a company's upstream and downstream activities (Scope 3). While 65% of the sampled companies have indicated the scope of their targets, it is unclear for 35% of the companies sampled (Figure 6.2).

More than 70% of the sampled companies have established roadmaps for achieving their targets, while 16% of the companies had no roadmaps despite having set targets. The level of detail of the roadmaps varies significantly among the companies; some have clear timelines for investment and technological adaptation, while others have produced roadmaps that are imprecise and vague.

Figure 6.2. Scope of emissions covered by the targets set by 26 companies by 2023



Note: The results refer to the companies that have set a decarbonisation target (net-zero or other) among the sample of companies analysed.
Source: OECD calculations based on companies' annual sustainability reports, companies' websites, and other media sources.

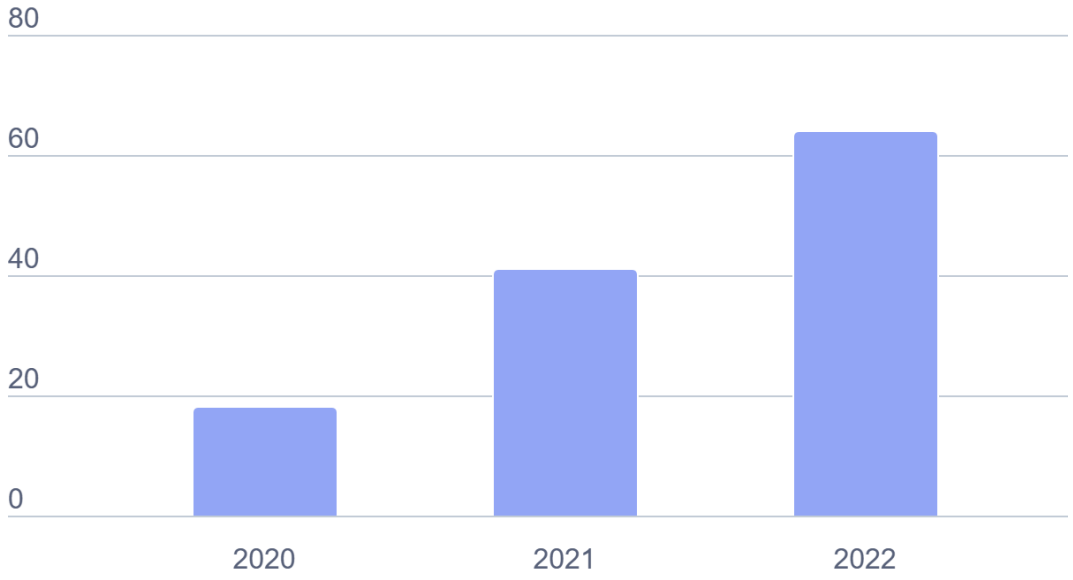
Low-carbon emissions projects

OECD work on decarbonisation has included the monitoring of low-carbon emissions projects announced by steelmakers. The monitoring goes beyond the 26 sampled companies discussed above, thereby providing a more comprehensive picture of the progress being made by the industry. Included in the monitoring are projects that meet the following criteria:

- directly target iron and steel production and impact direct emissions
- involve low-carbon steelmaking innovative technologies, or involve a full site transformation plan for decarbonisation purposes (typically existing BF-BOF transformation to direct reduced iron [DRI]-based EAF), or significant adaptation of the production process (BF with fuel switching/blending)
- involve a facility (industrial, demonstration or pilot scale) for which the production technology type is clearly identified in the announcement.

The monitoring identified nearly 65 announced projects meeting such criteria as of end 2022. The number of such projects has grown steadily in recent years, more than tripling between 2020 and the end of 2022 (Figure 6.3). However, against the background of rising excess capacity, in recent years, a growing number of companies have announced that decarbonisation projects are being postponed.

Figure 6.3. Number of low-carbon steel project announcements, 2020-22



Source: OECD calculations based on various information sources (Metal Expert, Kallanish, Platts, media, companies and regional steel associations websites).

Regional profile

Regionally, the European Union accounted for about 60% of the low-carbon project portfolio. China accounted for almost 15%, and North America and Asia (excluding China and India) accounted for 8% each. The relatively high level of EU projects reflects the region's early commitment to climate action, coupled with ambitious carbon targets (i.e. carbon neutrality by 2050). Furthermore, the significant role that BF-BOF steelmaking in the European Union provides is an important incentive for adopting breakthrough technologies to meet the target. At the same time, the relatively low share in North America reflects the already high adoption of EAF scrap-based steel production in the region.

In China, following the national pledge of carbon neutrality by 2060 and the target of emissions peaking by 2030, major Chinese steel producers have taken initiatives, such as the Global Low-Carbon Metallurgical Innovation Alliance launched by Baowu Steel in 2021. However, as noted earlier, new BOF construction continues to take place in China or via Chinese firms elsewhere in Asia, adding to already high emissions.

Project profile

The projects that have been announced comprise plant replacements (34% of the reported projects), new plants (31%), plant adaptation (22%) and research and development (R&D) stage projects (13%). Some 90% of the plant replacement projects involve a switch from BOF steelmaking to EAF, with DRI as the preferred feedstock for the EAF furnaces. The DRI would ultimately be produced using only green hydrogen, with natural gas being used on an interim basis in some cases.

Plant adaptation projects focus on maintaining the technology of the current asset while modifying some processes to lower carbon emissions. More than half of plant adaptation projects involve BFs, which produce the pig iron eventually used in BOFs. The adaptation foresees fuel blending or fuel switching, which would include the use of hydrogen, followed by carbon capture utilisation (CCU) (one-third). These adaptations provide a first step for a gradual transition, ultimately shifting to breakthrough technologies

compatible with near-zero emission steel production. The plant adaptation projects are either already implemented or planned to be completed by 2025.

With respect to new plant projects, half of the projects focus on DRI facilities. As with plant replacement, the focus is on ultimately using green hydrogen in the facilities, with the possibility that natural gas would be used initially. Other reported new plant projects include integrated DRI-EAF plants (one-third of new plant projects). The new plants, however, would not significantly affect the industry as they would impact less than 1% of current global capacity.

Finally, it is important to note that around 60% of the projects are designed to run on an industrial scale, but only 15% are in operation, almost all of which involve BF plant adaptation. The remaining projects are at the pilot or demonstration stage.

Challenges

While decarbonisation is an important area of focus for steel companies, and decarbonisation strategies are becoming more transparent and ambitious, there are challenges in implementing the strategies. These include: 1) scaling up innovative technologies; 2) resources; 3) costs and financing; 4) markets for low-emission steel; and 5) barriers to exit. The current rise in excess capacity further aggravates these challenges.

Scaling up innovative technologies

A high share of company decarbonisation strategies is based on using breakthrough low-carbon technologies and scrap-based EAF technology. For near-zero-compatible technologies, 74% of companies say that they will use CCUS, 52% will use hydrogen-based DRI production, and 11% will use IOE. Their ability to do so will depend on the speed at which the new technologies come to industrial maturity.

CCUS is the most-cited technology route by companies in their respective decarbonisation strategies. The technology has the benefit of being able to be retrofitted to existing blast furnaces, which is the central source of emissions in the BF-BOF steelmaking process, allowing emission reductions from existing steelmaking assets. However, chemical absorption technology for blast furnaces, essential for carbon removal, is at the large prototype stage, with several steps left until maturity (IEA, n.d.[7]). Chemical absorption technologies for DRI, on the other hand, are further along, at the commercial operation stage.

Hydrogen-based production of DRI for electric arc furnaces (H2-DRI-EAF) is the second most-cited low-carbon technology route steelmakers cite in their decarbonisation strategies. By using this route, companies can first implement emission reductions by transitioning to natural gas as a reductant and later replace natural gas with hydrogen as it becomes available. Using 100% electrolytic hydrogen as a reductant in the direct reduction step can enable large emission reductions, but this technology is at the full prototype stage. In addition, the DRI-EAF technology route requires high-quality iron ore, which is in limited supply.

IOE is another low-carbon technology route comprising alkaline iron electrolysis and molten oxide electrolysis. It is only mentioned by 11% of the companies but holds the potential to reduce the energy needed in steelmaking by 30% compared to traditional forms of steelmaking while significantly reducing emissions. The technology is, however, in the early stages of development.

Resources

Access to key resources is required to implement company decarbonisation strategies. Companies aim to switch to using hydrogen for iron reduction for use in electric furnaces or sequestering carbon. These changes will require large amounts of resources that were previously less in demand. CCUS requires infrastructure for carbon management and sites for carbon storage. In the International Energy Agency

(IEA) net-zero scenario, some 27 mmt of CO_2 is captured from the steel sector by 2030, then 131 mmt by 2035 and 399 mmt CO_2 by 2050, up from 1 mmt in 2022. In the sustainable development scenario from 2019, captured carbon reaches 400 mmt by 2050 (IEA, 2020[5]). This will significantly increase the need for carbon storage sites and carbon transportation from current levels.

Associated with the hydrogen direct reduction process is, as mentioned above, the issue of available iron ore of the relevant quality. The DRI-EAF process that is used by the majority of steel producers requires DR-grade pellets, which are iron ore pellets with a Fe content of over 67% and with low impurities (Agora, n.d.[8]) (IEEFA, n.d.[9]). Today, only 3-4% of current seaborne shipments of iron ore are of this quality, significantly below what is deemed necessary for meeting expected demand. Options are being explored, but iron ore availability appears to be a bottleneck for transitioning to the hydrogen-DRI-EAF route (H2-DRI-EAF).

One-third of company decarbonisation roadmaps indicate higher use of scrap-based steelmaking as a key step to their decarbonisation. The availability of scrap, which is material generated as new steel is processed and obsolete articles containing steel (like automobiles) are discarded, is an issue. The challenge is most pertinent in developing economies where steel demand is expected to grow the most but where scrap availability is most limited.

The availability of renewable-based electricity will also be key, particularly in the case of electric furnace steelmaking and in advancing certain emerging technologies, such as IOE.

Financial costs

Achieving decarbonisation targets will require substantial capital expenditures for new plants and technologies and, where needed, adaptation of existing plants. A low-emission demonstration plant, for example, could cost between EUR 5 million (euros) and EUR 400 million; a scaled-up intermediate version could cost between EUR 500 million and EUR 1 billion, while the deployment of a fully operational plant could cost around EUR 1 billion (De Santis et al., 2021[10]).

With respect to specific technologies, the H2-DRI-EAF route, the second most popular route that companies are planning to develop, requires significant modification of existing plants or the construction of completely new plants. Switching to the H2-DRI-EAF route from existing BF-BOF plants implies that most major facilities and equipment (coke making, sintering, blast furnace and basic oxygen furnace) have to be replaced by new units. The estimated investment costs for an H2-DRI-EAF operation are EUR 574 per tonne of capacity, which is about 30% higher than the cost of a greenfield BF-BOF operation (Vogl, Åhman and Nilsson, 2018[11]) (Wörtler et al., 2013[12]).

Further analysis is needed to determine the total cost of decarbonisation for the industry under various scenarios and the prospects for funding the transition. Some analysis has already been carried out on the impact that decarbonisation could have on steelmaking costs. The IEA, for example, has estimated that the costs per tonne of product could rise by 10-50%, with significant variation among countries and companies (IEA, 2020[13]). The variability and level of the cost increases could thus have a significant impact on the competitiveness of individual producers. With respect to the total cost of decarbonisation, estimates vary significantly but generally exceed USD 1 trillion (US dollars), some far more than this level.[1] In the current circumstances, where excess capacity is rising, and prices and profitability of steel firms are under pressure, it becomes increasingly difficult for investments of such size to materialise.

Markets for low-emission steel

As mentioned above, the cost of producing steel in a decarbonised manner will add significantly to costs; the ability of companies to pass these costs on to customers through higher prices will be difficult as steel markets are highly competitive with respect to prices. Success in this regard will, in part, rely on companies' abilities to differentiate their low-emission steel from steel that has not been produced using advanced low-

emission technologies. The effects may be muted, however, in sectors where steel is an important component of a final product but accounts for a small percentage of final costs. According to a report from the Mission Possible Partnership, passenger car cost increases from low-carbon steelmaking, for example, will reach 0.5%, 2.1% for construction and 1.5% for white goods in 2030. By 2050, these cost increases fall to 0.3%, 1.4% and 1% respectively (MPP, 2022[14]).

Moreover, the consumer and societal pressures for steel-using industries to use low-emission steel may create a growing market for producers. A growing number of companies that use steel, for example, have announced their commitment to procure such steel on a voluntary basis. This includes 28 companies that made a specific commitment to ensure that at least 10% (by volume) of all of their steel purchased per year will be near-zero emissions by 2030. The commitment was made under the First Movers Coalition, which is the world's largest private sector initiative wherein members commit to purchasing low-emission products (First Movers Coalition, n.d.[15]).

In addition, some sample companies are involved in partnership projects, either in the form of off-take agreements with their customers or joint development projects for low-emission technology with stakeholders such as the government, energy producers and academia. However, further development of markets for green steel products may require the development of internationally recognised definitions of green steel; differences across jurisdictions could otherwise undermine progress on this front.

Barriers to exit

The social and economic costs of closing uncompetitive steel facilities, along with the cost of any environmental remediation that may be required, have slowed the retirement of such facilities, which in turn has contributed significantly to global overcapacity in the industry. Excess capacity has impacted prices and costs, resulting in an overall weakening of the financial performance of steelmakers, thereby lowering the financial resources available to invest in new plants and equipment for decarbonisation and other purposes. The increased need for steelmakers to reduce carbon emissions may eventually provide greater pressure for the uncompetitive facilities to be closed, but this will take time, thereby potentially delaying the implementation of decarbonisation strategies.

Government policies

Governments have promoted decarbonisation in the steel industry through a number of measures, including:

- **Establishing industry or company net-zero level targets**: Target achievement years range from 2027 to 2030, though most are set for 2050.
- **Carbon pricing**: These are mechanisms established by governments to capture the external costs of greenhouse gas emissions, tying them to their sources through a price, usually in the form of a price on the carbon dioxide emitted. The measures are not widely used, as only around 20% of steelmaking capacity is covered by such policies.
- **Technology support**: A total of 87 support policies were identified covering 8 low-carbon steelmaking technologies in the 11 countries/jurisdictions covered in the OECD analysis (i.e. Brazil, Canada, China, European Union, India, Indonesia, Japan, Korea, Türkiye, United States and Viet Nam). Hydrogen-oriented policies were the most common of the named technologies, followed by energy efficiency, scrap (tied), and CCUS. The majority of policies, however, have not been technology-specific.

The policies have demand-side and supply-side dimensions. Supply-side policies target the production of goods and services to limit emissions or to support alternative emission-free production. In contrast, demand-side policies are designed to increase demand for low-carbon products or lower demand for

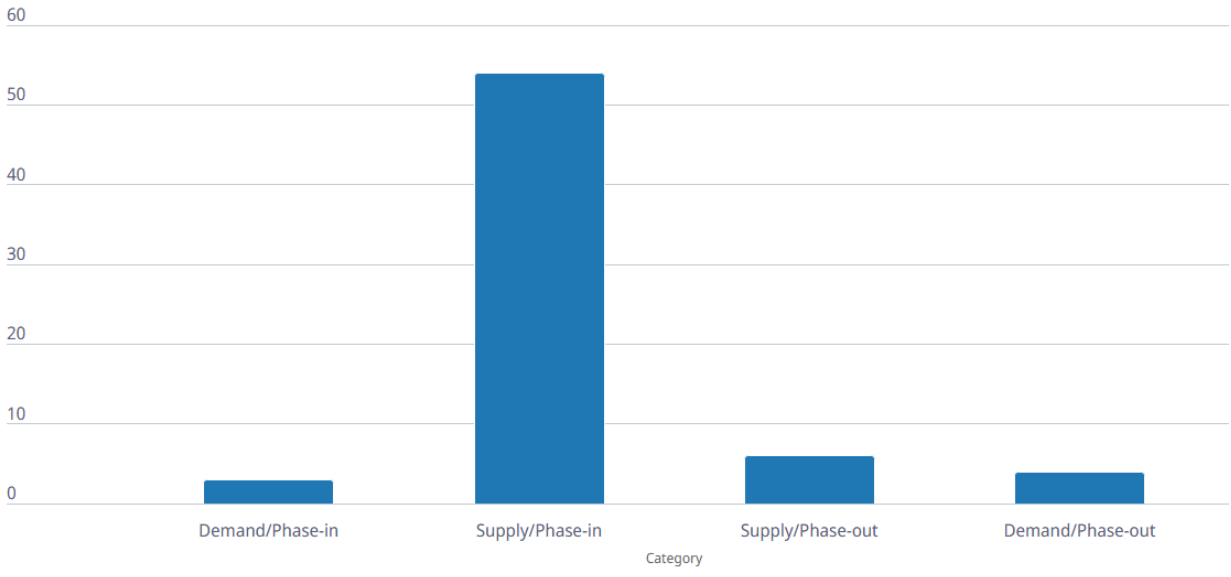
emission-intensive products. Additionally, the policies can be further categorised as phase-in policies, which promote the production of and demand for low-carbon steel or phase-out policies, which reduce the capacity of and demand for emission-intensive steel. Most of the identified policies were supply-side, phase-in (Figure 6.4). In the context of rising excess capacity challenges, Figure 6.4 shows that the use of phase-out policies is currently very limited.

The policies can also be mapped to the five challenges facing the industry that are mentioned above. Technology scale-up was the leading area addressed by policies, followed by mobilising resources necessary for low-carbon steelmaking and financial costs. Relatively few policies were directed to exit barriers and the development of demand for low-emission steel.

Looking towards the future, attention should be paid to the following in developing and adapting policies:

- Technology is evolving rapidly, and policies will need to be adapted to respond to evolving needs.
- Close co-ordination between government and companies on decarbonisation strategies is essential, as is the need to co-ordinate policies to ensure that the infrastructure is in place to facilitate the steel industry's decarbonisation.
- International co-operation should be enhanced with a view to identifying best decarbonisation practices and common understandings of the challenges facing the industry.
- Actions will need to be taken to promote demand for low-emission steel through, for example, government procurement, as well as through market incentives that increase demand for low-emission steel.
- Excess capacity is a persistent problem in the steel sector due to market-distorting subsidies and barriers to exit; policymakers should consider how to enable "space" in the market for new low-carbon steel plants by increasing the exit rate for emission-intensive plants that are, in particular, contributing to the excess capacity.

Figure 6.4. Number of government policies promoting decarbonisation in the steel industry that are demand-side/phase-in and phase-out and supply-side/phase-in and phase-out



Source: OECD calculations based on various information sources (Metal Expert, Kallanish, Platts, media, companies and regional steel associations websites).

The outlook for scrap availability

Recycled ferrous scrap is a key ingredient used in steelmaking, particularly in electric furnaces, where it can be used for up to 100% of the ferrous metallics charge for certain steel products (e.g. rebar). The scrap arises: 1) from within steel mills as steel is processed from semifinished products to a wide range of finished products (home scrap); 2) when steel is shaped into component parts for final products, such as automobiles and household appliances (prompt industrial scrap); and 3) when steel is recovered from obsolete machinery and equipment that has been discarded (obsolete scrap). Approximately 650 million tonnes of scrap are recycled by the industry annually, helping to reduce industry emissions of CO_2 by approximately 975 million tonnes annually (World Steel Association, 2021[16]). The recycling of scrap has also been beneficial, as it lowers the use of natural resources, such as iron ore, coal and limestone. The material has thus increased its strategic importance over time, playing an important role in industry decarbonisation efforts.

Significant volumes of scrap are traded internationally. In 2022, some 65 million tonnes were exported, accounting for approximately 10% of total consumption. The European Union and the United States were the leading suppliers, shipping more than 17 million tonnes each to foreign markets, thereby accounting for 54% of total exports (excluding intra-EU trade) (International Steel Statistics Bureau, 2022[17]). The United Kingdom, Japan and Canada also exported significant tonnages; together with the European Union and the United States, they collectively accounted for 85% of the world total. Scrap import volumes are similarly concentrated among a small number of economies, as the biggest ten importers accounted for nearly 90% of the global total in 2022. India and Türkiye, the two largest importers, together accounted for around half of the total, with Türkiye alone accounting for more than one-third of the total.

Export policies

The strategic importance of scrap has resulted in a number of countries introducing measures to control exports. In 2022, some 72 export measures affecting 3.3 million tonnes of exports were in effect globally (Figure 6.5).

Figure 6.5. Steel scrap export measures, number and volume of exports subject to measures, 2022

Note: No data available on the volume of scrap subject to export surtax or fiscal tax on exports.
Source: Authors' calculations based on International Steel Statistics Bureau (2022[17]), *Bilateral scrap trade data* and OECD (2024[20]), "Unlocking potential in the global scrap steel market", https://doi.org/10.1787/d7557242-en.

Export taxes and licensing requirements were the most common policies, followed closely by export quotas. With respect to export taxes, China maintains a tax of 40%, while the Russian Federation (hereafter "Russia") imposes one of 15%. (Government of India, 2019[18])

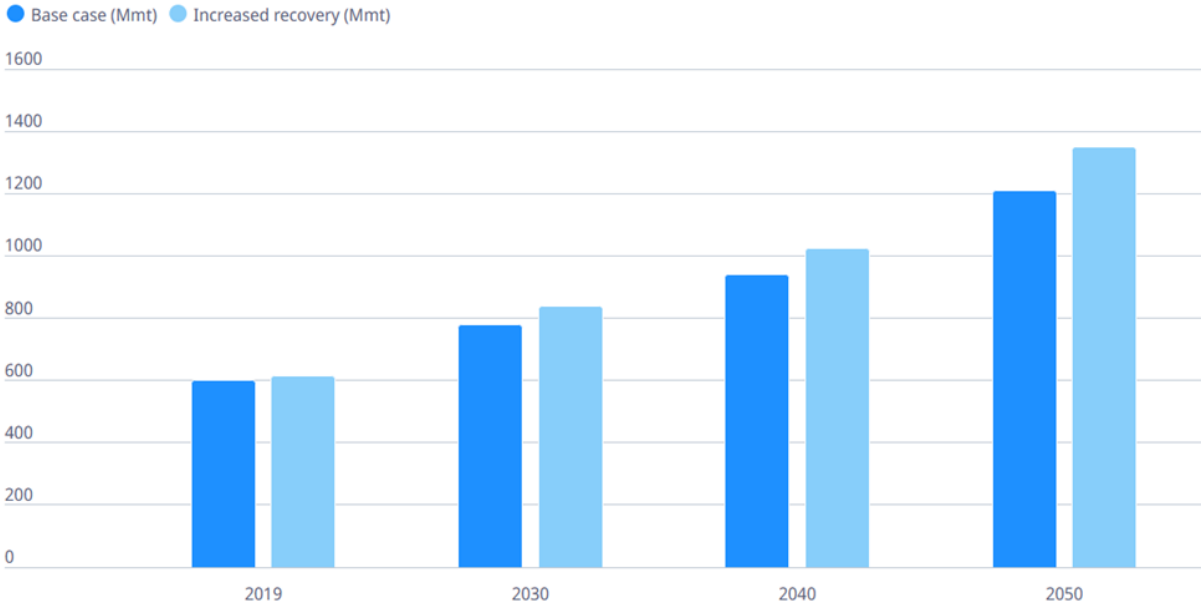
Scrap market outlook

The external commercial market for scrap comprises prompt industrial scrap and obsolete scrap. Prompt industrial scrap is price inelastic as it is a byproduct of manufacturing and, as such, is generated at a fixed rate that is not sensitive to price fluctuations. In contrast, prices for obsolete scrap are elastic; as prices rise, recovery of obsolete material will increase, expanding the supply of available material. The amount of steel scrap that is potentially recoverable each year, however, is not unlimited; rather, it is based on the historical sectoral mix of steel consumption, including indirect imports and the specific life span of steel products. For example, motor vehicles may remain in use for 15 years before being recycled, while the life of steel used in construction might range from 30 to 60 years or longer. Moreover, there are limitations on the amount of steel that could technically be recovered, depending on recovery costs and other limitations.

OECD analysis shows that the global supply of available external scrap will likely increase sharply in the coming decades due to the large volume of steel products consumed since the turn of the century that will reach the end of their useful lives and could, therefore, be recycled. Based on historical recovery rates, external scrap availability could double between 2019 and 2050, from 600 mmt to over 1 200 mmt. Prompt industrial scrap will also increase, reflecting increasing manufacturing and construction activity. China is expected to account for over 60% of the increase, with its availability rising threefold, from 170 mmt in 2019 to 545 mmt in 2050 (OECD, 2024[20]).

With rising demand for scrap to support decarbonisation, increased and accelerated recovery rates could increase global scrap availability to 1 350 mmt in 2050 (Figure 6.6). This would entail digging deeper into the reservoir of recoverable obsolete scrap. Demand would be further bolstered by a rise in electric furnace steelmaking, from 510 mmt in 2019 to 1 340 mmt in 2050; in this scenario, electric furnaces would account for 50% of crude steel production in 2050, up from 27% in 2019.

Figure 6.6. Potential global scrap availability in an increased and accelerated recovery scenario



Source: World Steel Dynamics (WSD) model.

The rise in scrap supply presumes that the scrap recycling industry will be able to expand its collection, processing and distribution capacities. The structure of the industry is already changing as steel producers around the world are investing upstream to acquire scrap operations. More than a strategy to simply ensure captive supply, these moves often entail investment in equipment, transportation infrastructure and advanced detection/selection technologies to optimise the use values of different types of scrap. There may be a role for governments as well. In India, for example, the government has developed a comprehensive Steel Scrap Recycling Policy that identifies bottlenecks and inefficiencies in current practices and outlines a series of steps to improve efficiency, increase collection rates, and lower the costs of scrap recycling (Government of India, 2019[18]).

As scrap supply and demand grow, one key question is the role that international trade in scrap will play. While measures controlling scrap exports are currently limited for the most part to a handful of African countries, plus China and Russia, the treatment of scrap as a strategic material needed to support environmental objectives is likely to grow, which could tempt a larger number of governments to introduce measures that limit exports or otherwise favour domestic steelmakers.

Circular economy

Alongside efforts to promote and realise decarbonisation are more general efforts to create a circular economy, which is a model of production and consumption involving sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. The model embraces four main principles in the case of steel (the four Rs): 1) reduce the amount of material, energy and other resources used to produce steel and develop needed products that are lighter than existing ones; 2) reuse steel in similar ways, without significantly altering its physical form; 3) refurbish or restore steel to a new state; and 4) recycle steel products at the end of their useful life to create new products (World Steel Association, 2023[21]). Recycling ferrous scrap fits neatly into Point 4. The challenges facing the industry and government principally involve providing the infrastructure for recovering, sorting, processing and distributing the scrap to steel markets and, with respect to governments, ensuring that incentives to maximise scrap use are in place (OECD, 2024[22]).

The future landscape of low-emission iron production

The transition to low-emission iron will likely reshape the global steel industry, driven by the need to meet climate targets and significantly reduce carbon emissions associated with the steel industry. While efficiency improvements and carbon capture technologies have contributed to lowering emissions, they are insufficient for full decarbonisation. A fundamental shift in iron production is required, particularly through hydrogen-based processes for the production of iron intermediate products such as DRI and hot briquetted iron (HBI). These technologies rely on high-grade iron ores and substantial renewable energy, both of which are unevenly distributed globally. As a result, the geographic landscape of iron and steel production is changing, with ironmaking potentially increasingly shifting to regions that have both an abundant supply of high-grade ore and low-cost renewable energy.

This possible shift in production locations may transform international trade flows in iron and steel. Ultimately, the transition to low-emission iron should not occur in a policy vacuum but through careful planning and international co-operation. It is important for governments and industry stakeholders to anticipate the broader consequences of this structural shift, supporting innovation while ensuring a level playing field. This includes fostering stable trade frameworks, aligning environmental regulations, and avoiding excessive state intervention that could create market distortions.

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Notes

1. See, for example, McKinsey Sustainability (https://www.mckinsey.com/capabilities/sustainability/our-insights/spotting-green-business-opportunities-in-a-surging-net-zero-world/transition-to-net-zero/steel), Mission Possible Partnership (https://3stepsolutions.s3-accelerate.amazonaws.com/assets/custom/010856/downloads/Making-Net-Zero-Steel-possible.pdf) and Wood Mackenzie (www.woodmac.com/horizons/pedal-to-the-metal-iron-and-steels-one-point-four-trillion-usd-shot-at-decarbonisation/).

OECD Steel Outlook 2025

The Steel Outlook is the OECD's annual analysis of the world steel market. It provides the most up to date figures and the medium term outlook showing developments in the world steel market by area, and the main characteristics, apparent consumption, trade and production trends in the steel industry globally.

The global steel industry faces persistent challenges that are likely to intensify through 2025 and beyond. Planned capacity expansions risk deepening global excess capacity amid sluggish demand growth. Capacity utilisation could fall, intensifying downward pressure on prices and profitability. Regional demand trends diverge: while ASEAN and MENA show stronger growth, demand is declining in China and remaining constant in OECD economies.

Competition is distorted by subsidies, particularly in China, ASEAN, and MENA. China's subsidies (as a share of firm revenues) are 10 times higher than those in OECD countries, encouraging overcapacity and unviable investments. In parallel, Chinese steel exports surged, prompting a sharp rise in trade actions and raising concerns about circumvention practices. These trade distortions underscore the urgency of addressing non market policies driving global imbalances.

Excess capacity is also undermining investment in steel decarbonisation. While many firms are pursuing decarbonisation technologies, progress is uneven due to limited access to renewable energy and high grade ores. This could shift production and trade patterns over time.

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