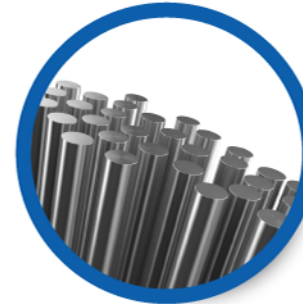


# Steel

## Australian steel refineries



## Steel facts



Made in specialised blast furnaces, mainly out of **iron and carbon**



1,000 kg of steel requires **1,400 kg of iron and 800 kg of coal** to make



Pure steel is **1,000 times stronger** than iron



Steel is the **world's 2nd largest industry**

## World consumption



**52%**  
Construction



**16%**  
Mechanical machinery



**12%**  
Other applications



**12%**  
Automotive



**5%**  
Other Transport



**3%**  
Electrical Equipment

## Australia's steel



**5m+ tonnes**  
produced  
each year

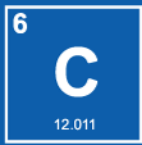


**100,000+**  
employed in  
steelmaking



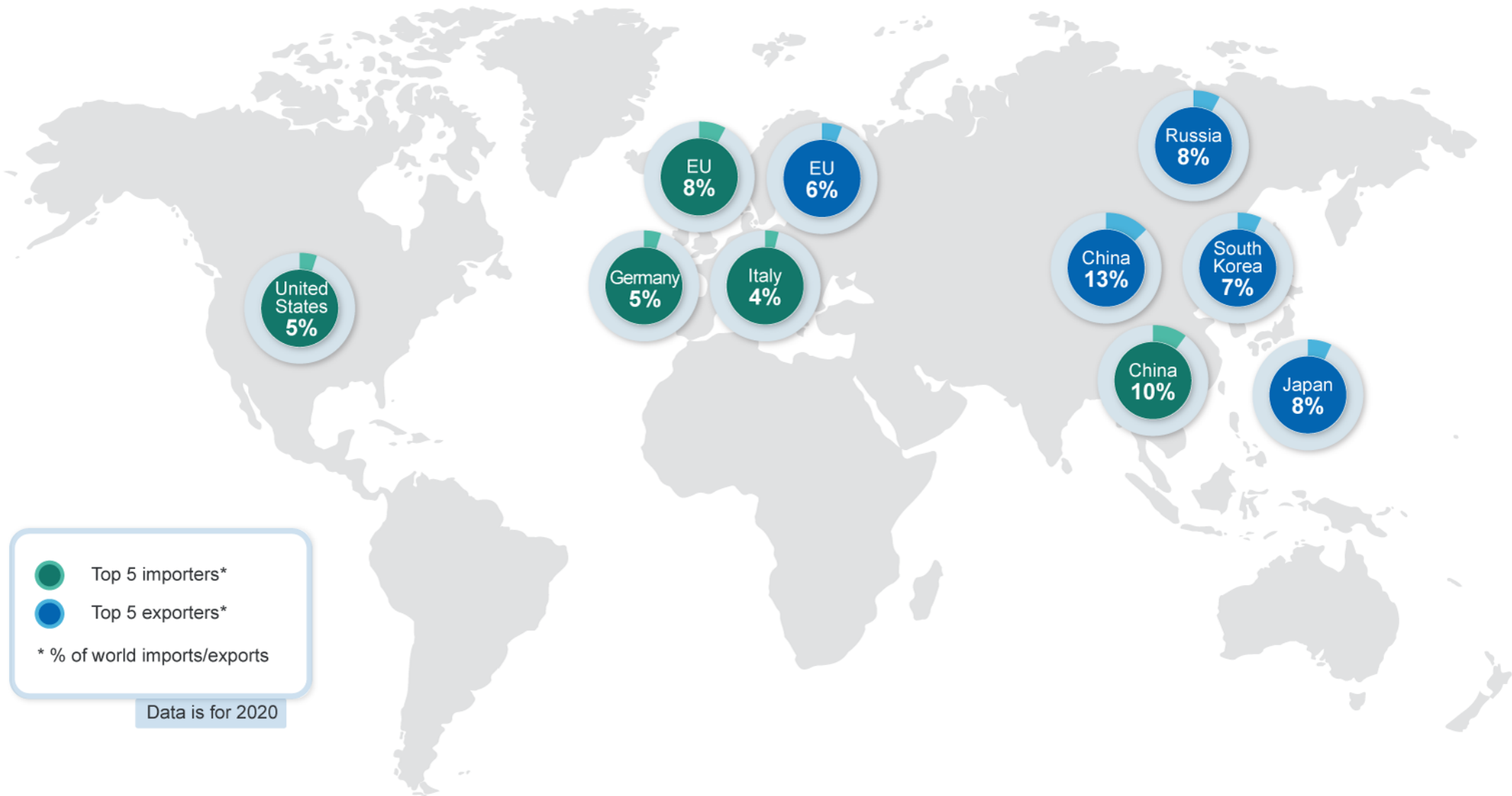
**Significant**  
export  
markets

- China
- Japan
- South Korea
- Taiwan
- India



# Steel

Trade map | June 2022



● Top 5 importers\*  
● Top 5 exporters\*  
\* % of world imports/exports

Data is for 2020

### 3.1 Summary

- World steel production is now forecast to grow by 0.6% in 2022 — a significant (1.6 percentage point) downward revision from the March *Resources and Energy Quarterly* (REQ). This follows recent outbreaks of the COVID-19 pandemic in China, as well as impacts to major steel markets and global supply chains from current energy shortages and Russia's invasion of Ukraine.
- Global construction activity is expected to drive modest growth in world steel demand in 2022, with large infrastructure rollouts, and rising non-residential construction. However, this will be partially offset by further cuts to global auto production and subdued residential construction.
- Over the outlook period, global steel output is expected to grow by 1.3% in 2023 and by 1.1% in 2024. China is expected to record lower steel output (as part of its aim for peak steel), with the EU/Japan to stay at current levels, and India/Brazil to see annual growth of 4-6% to 2024.

### 3.2 World consumption and production

#### Steel output in 2022 facing weakened demand, and supply disruptions

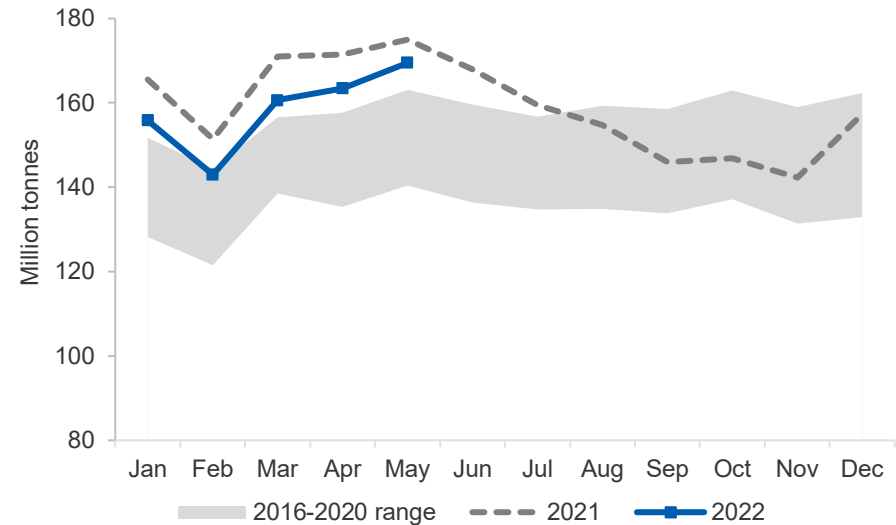
Global steel production in the five months to May 2022 was around 792 million tonnes. This was 5.0% lower compared with 2021, but 2.4% above the average output for the period from 2016 to 2020 (Figure 3.1).

Following an impressive recovery in the global economy through 2021, world industrial production is forecast to see solid (but lower) growth in 2022, as economies continue to emerge from the pandemic and ease toward longer-run growth trajectories. At the start of this year, this growth was expected to see a comparable rise in global steel production in 2022 of 2.2%.

However, critical shocks to the global economy and supply chains so far in 2022 have inhibited industrial production in recent months, and are expected to weigh on global steel demand and production over the remainder of 2022 (Figure 3.2).

The impacts of a slowing residential property sector in China have been exacerbated by new outbreaks of the COVID-19 pandemic from March.

Figure 3.1: Global monthly steel production



Source: World Steel Association (2022)

Figure 3.2: World industrial production and steel output



Source: World Steel Association (2022); Bloomberg (2022); CPB (2022)

Russia's invasion of Ukraine is also expected to lead directly to cuts to steel production this year, as well as more significant indirect impacts to major steel producers such as the EU, US and Asia. This is due to their ongoing reliance on Russian energy, and other critical components for steel-intensive products (palladium and neon in the production of automobiles for example) sourced from both Russia and Ukraine.

Amongst the major producers, China is expected to see a slight fall in steel output in 2022, while Japan, the US and South Korea are all expected to see modest growth. Ongoing power shortages (see *Thermal Coal chapter*) present growing risks to the 5 million tonnes additional steel production capacity forecast for India. And given current energy shortages, the EU is now expected to see a 3.3% drop in total steel output in 2022.

Over the outlook period to the end of 2024, stimulus-related infrastructure and a rebound in industrial production from current obstacles are expected to see growth in steel demand continue, but at more modest levels. World steel production is projected to grow by 1.3% in 2023 to reach 1.99 billion tonnes, and by 1.1% in 2024 to reach 2.01 billion tonnes. However, a worsening of supply chain disruptions and inflationary pressures carry the potential of curtailing or reversing this growth over the outlook period.

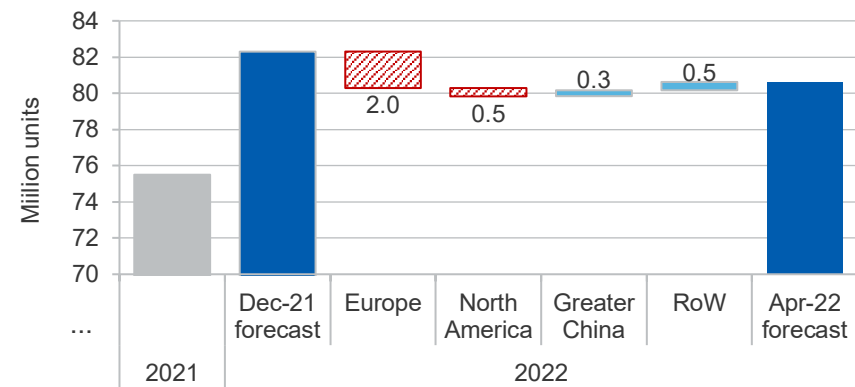
#### Construction to spur steel demand in 2022, offsetting auto production cuts

Global steel consumption is forecast to grow by 0.5% in 2022 — a 1.8 percentage point reduction from the March 2022 REQ.

In early June, the OECD downgraded its 2022 forecast for global growth (from 4.5%) to 3.0%. This reduction was based on intensified impacts from the Russian invasion of Ukraine (as well as from related sanctions), continued global price pressures, and recent outbreaks of the COVID-19 pandemic in China (see *Macroeconomic Outlook chapter*).

Despite the cut to forecast world growth, global construction activity is expected to rise by about 2.2% in 2022, and remain robust over the period to 2024. This will be driven by infrastructure-related stimulus — especially in the US and Asia. Non-residential construction activity in Europe (as part of the Next Generation EU "Renovation Wave") and the Middle East (as part of its Vision 2030 strategic framework), are also forecast to lift activity.

**Figure 3.3: S&P Global 2022 light vehicle production forecasts**



Notes: Forecast released 20 April 2022

Source: S&P Global IHS Markit (2022)

Rising input costs and supply shortages are expected to continue to subdue residential construction activity, with comparatively weaker growth expectations over the outlook period. Price pressures and raw material shortages also carry the potential to spill over into other construction activity (infrastructure and non-residential) over this time.

Following a severely impacted 2021, the automotive sector had been expected to see improved conditions this year. However, the ongoing semiconductor chip shortage has been further aggravated by the Russian invasion of Ukraine, and China's current COVID-19 outbreaks. These disruptions are now expected to persist through to 2023.

Ukraine and Russia are the world's largest producers of neon and palladium, respectively — both critical inputs to semiconductor chips and catalytic converters. This, and other shortages, had already seen major producers in Europe announce production cuts in March. Revised forecasts from S&P Global and IHS Markit as of late April now expect 1.7 million less light vehicles to be produced globally (compared with its December 2021 forecasts) in both 2022 and 2023 (Figure 3.3). New outbreaks of the COVID-19 pandemic starting in March 2022 saw new vehicle sales in China fall 48% year-on-year in the month of April.

The global manufacturing sector has also been hindered by high energy prices and raw materials shortages so far in 2022. The JPMorgan Global Manufacturing PMI was 52.4 in May, only marginally above the 20 month low (of 52.3) reached in April. New orders and international trade volumes remained subdued in May, while reported input cost increases continued to stay at near-record levels, suggesting global inflationary pressures are likely to persist in the near-term.

Over the outlook period, global steel consumption is expected to grow by 1.1% in 2023 and 2024, as COVID-related containment measures are removed, and global supply chains adjust. The slight downgrade in growth compared with the March 2022 REQ reflects the expectation that energy and supply chain shortages are likely to persist in the short term.

#### China targeting a fall in total steel output in 2022

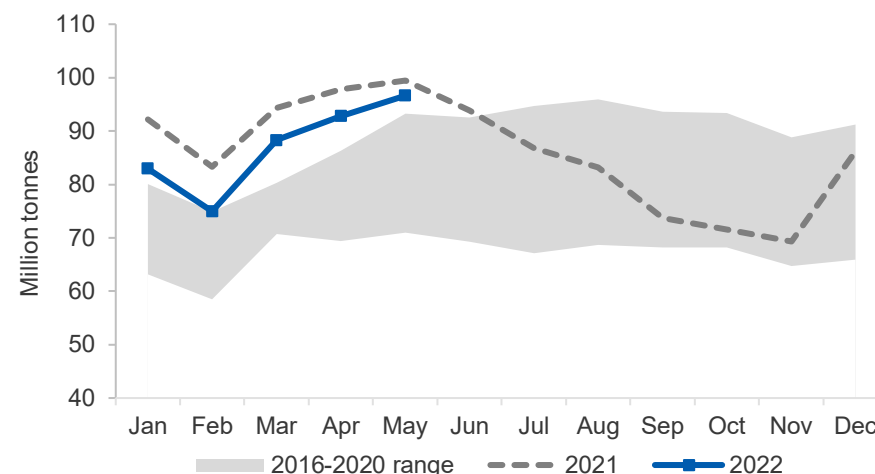
China's total steel production was around 436 million tonnes in the five months to May 2022. This was 6.7% lower than previous year, though remained 5.0% higher than the year-to-May average for the period 2016 to 2020. (Figure 3.4).

The year-on-year fall reflected a range of factors, including winter production curbs in place from 1 January to 15 March. These curbs — intended to mitigate pollution levels in many northern provinces — required mills to maintain output around 30% below 2021 levels. Steel output in January and February was also impacted by efforts of China's Government to limit industrial activity and ensure reduced air pollution (and blue skies) for the Beijing Winter Olympics. Renewed COVID-19 lockdowns in the city of Tangshan — China's largest steel producing city — in both March and April, are also likely to have impacted total output over the period.

In April, a number of China's key government agencies reiterated the aim to reduce total steel output in 2022. This is part of the country's efforts to achieve peak steel emissions by 2030 and net zero emissions by 2060.

This goal also reflects China's longer-term aim to deleverage certain parts of its economy, and to shift away from investment and export-driven growth toward a more consumption-oriented growth model.

**Figure 3.4: China monthly steel production**



Source: Bloomberg (2022); World Steel Association (2022)

#### China's demand for steel to be bolstered by new infrastructure...

However, China will need to manage this longer-term transition alongside its stated priority for 2022 of economic stability. With China's year-on-year GDP growth below 5% for three consecutive quarters (to March quarter 2022), as well as the recent COVID-19 outbreaks, the government is still expected to act to substantially boost infrastructure-related construction activity — which typically represents around 20-25% of the country's total consumption of steel — further in the second half of 2022.

Infrastructure investment has already seen a significant ramp up this year, with the central government front loading issuance of around RMB 1.25 trillion (US\$200 billion) in local government special purpose bonds for project construction by the end of March. The government plans to issue around RMB 3.65 trillion (US\$550 billion) in special purpose bonds for the full year 2022, which will be further bolstered by carryover of unallocated bonds from last year. In May, total infrastructure investment was 8.0% higher compared with 2021 (Figure 3.5). In early June, the Central Government also instructed state-owned policy banks to increase the credit line by another RMB 800 billion (US\$120 billion) to provide financial support for infrastructure building.

**Figure 3.5: China's infrastructure investment**



Notes: *Infrastructure investment* year-on-year change based on a 3 month moving average  
Source: NBS (2022); Bloomberg (2022)

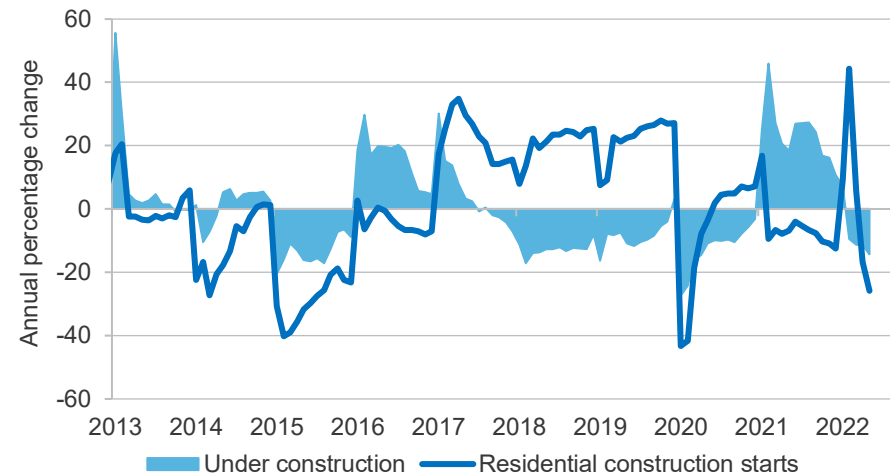
### ...but China's property and manufacturing sectors face headwinds

Further weakness in China's residential property sector — which typically accounts for around 35-40% of China's total steel consumption — carries the potential to curtail the strength of the rise in the country's total construction activity in 2022.

China's property sector continues to experience liquidity pressures, with the country's third largest developer, Sunac, missing interest payments on dollar-denominated notes due in April. New construction starts and total construction activity have been very weak so far in 2022, falling 26% and 14% year-on-year, respectively, in the year to May (Figure 3.6).

Weakness in the property sector has also been further exacerbated by the breakout of new COVID cases across China from March. It is estimated that as many as 87 cities had some sort of restrictions in place in May, impacting close to 400 million people. This includes major hubs such as Shanghai, Beijing and Guangzhou.

**Figure 3.6: China's residential property sector**



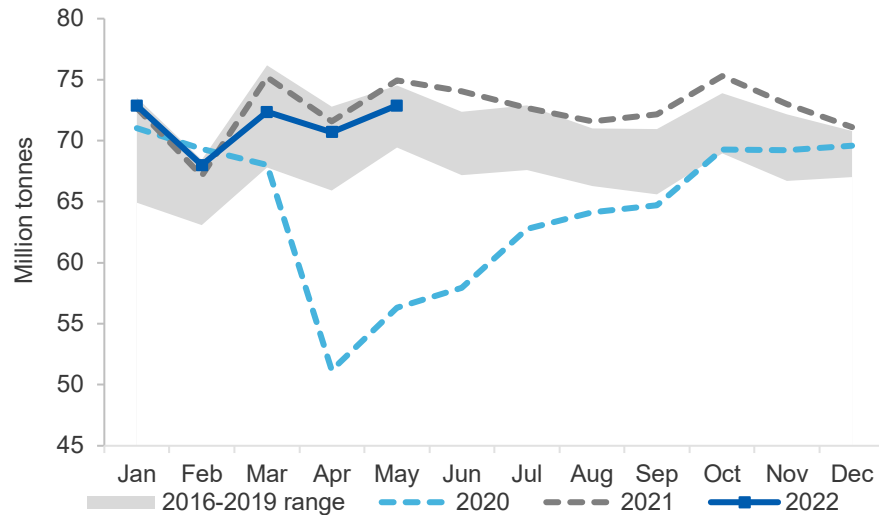
Notes: Measured by cumulative million square metres in each calendar year.  
Source: Bloomberg (2022); Department of Industry, Science and Resources (2022)

Total new home sales in the five months to May for China's top 100 developers have fallen by half, while new land sales in the top 50 cities were down 20% year-on-year in April. This carries broader implications for China's economy and government spending over the outlook, with land sales typically accounting for a large share of local government revenue.

The Chinese Government has continued to take steps to stabilise the sector and ensure the completion of existing projects, including loosening its 'Three Red Lines' policy to improve fund availability for developers to finish existing projects. Credit conditions have also been eased further, with a cut to the bank Reserve Ratio Requirement (RRR) in April, and the five-year loan prime rate — the benchmark rate for mortgages — in May.

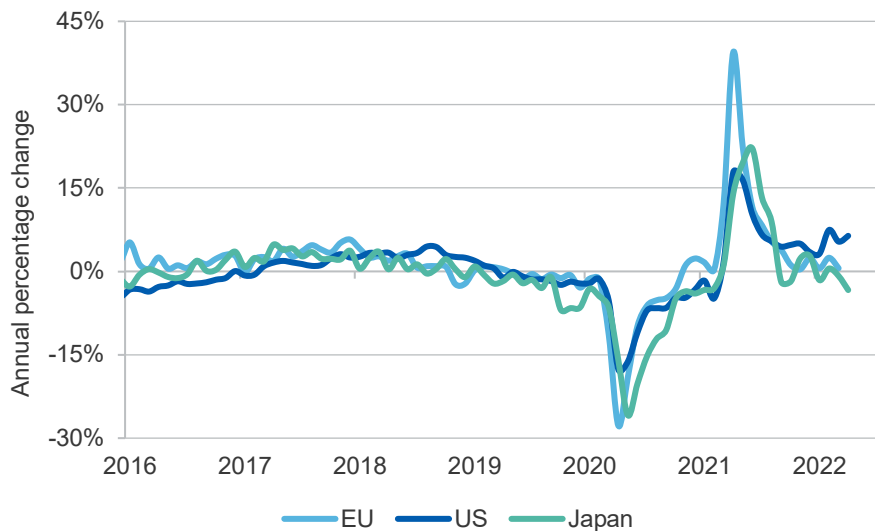
China's central bank is also taking steps to respond to the fallout from the recent Covid-19 outbreaks, rolling out 23 new measures to stabilise the economy. This includes increased incentives for banks to lend to small and micro businesses, mortgage relief for those impact by COVID-19 quarantine conditions, and further financing (particularly to local government financing vehicles) for major infrastructure projects.

**Figure 3.7: Monthly steel production – Global (exc. China)**



Source: World Steel Association (2022)

**Figure 3.8: Monthly industrial production — EU, US and Japan**



Source: Bloomberg (2022)

However, recent COVID-19 outbreaks are expected to constrain China’s manufacturing sector in the short term, with the official manufacturing PMI recording three consecutive months of contraction to May (including a reading of 47.4 in April, the weakest since March 2020. With the US (as well as other major economies) expected to continue to tighten monetary conditions in 2022, this sector remains exposed to a potential weakening in global demand for China’s exports over the outlook.

**Russia-Ukraine conflict to lead to supply cuts, with further downside risks**

Russia’s invasion of Ukraine is expected to further constrain global steel supply in 2022. The capture of eastern provinces of Ukraine by Russian forces — where a significant proportion of the country’s steel mill capacity resides — will see a substantial reduction in steel production from Ukraine this year and potentially beyond.

In early March, the EU agreed a fourth package of restrictive measures against Russia that included an import ban on Russian exports of steel (which totalled around 3.2 million tonnes in 2020). Sanctions against Russia are also expected to impact critical inputs to steel for major markets, with the loss of iron ore pellets to Europe (around 8 million tonnes in 2021) expected to impact the region’s Electric Arc Furnace (EAF) steelmaking. Loss of Russian pig iron exports (an intermediate product in the steelmaking process) could also lead to some shortages of inputs for US-based steelmakers (which imported around 1 million tonnes of Russian pig iron in 2021).

While Russian producers are expected to seek alternative markets for these products, logistical constraints remain a key barrier to a full reallocation in the short term. Over the outlook period, the rising impact of sanctions on Russia’s industrial activity and access to financing and capital investment, carry further downside risks to Russian steel output.

**Other major producers impacted by energy and supply chain disruptions**

Energy shortages and other supply chain disruptions have continued to impact manufacturing activity across major economies so far in 2022, with industrial production in the EU, US and Japan all continuing to trend lower in recent months (Figure 3.8).

In the five months to May 2022, world steel output (excluding China) was 357 million tonnes. This was 1.3% lower than 2021, and 2.4% lower than the year-to-May average for the period 2016 to 2019. (Figure 3.7).

Steel production in the EU — the world’s second largest steel-producer — fell by 4.3% year-on-year for the five months to May 2022 (and was also 3.1% below 2019 levels) to reach around 58 million tonnes. After a rapid recovery in economic activity in the first half of 2021, industrial production in the EU has since softened (Figure 3.8). After reaching a low of zero growth (year-on-year) in January, activity has remained weak, rising just 0.6% year-on-year in March.

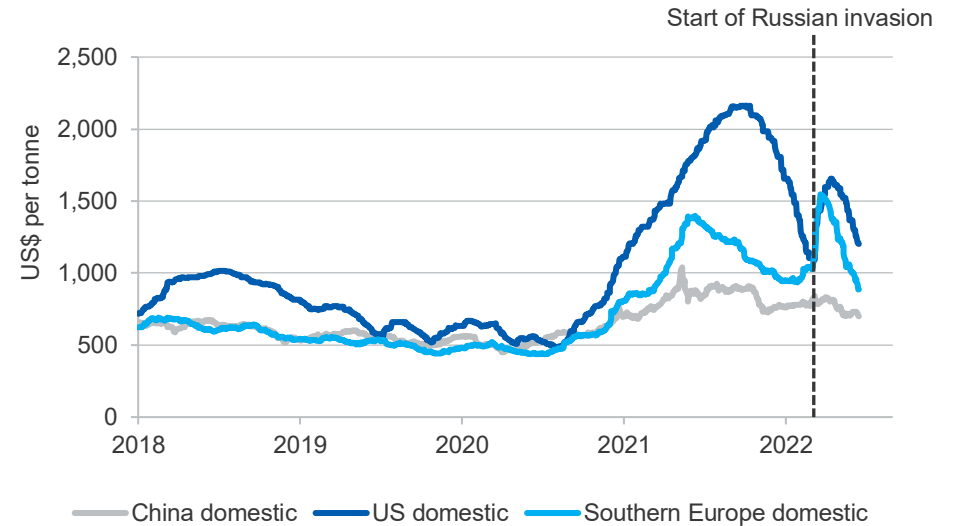
This softness follows a further wave of the COVID-19 pandemic (Omicron variant) through their winter period, as well as acute global supply chain disruptions. These issues have seen rising price pressures throughout Europe, with the Eurozone Producer Price Index rising 37% year-on-year in April and the Consumer Price Index rising 8.1% year-on-year in May — the highest level since the creation of the Euro.

Europe’s natural gas supplies remain at risk of further shortages, due to Russia’s invasion of Ukraine (and subsequent sanctions). This has seen Russia halt gas exports to some EU members in April and May (see *Gas chapter*). Europe’s Steel Association (Eurofer) now projects EU steel demand to fall 1.9% in 2022 (in February it forecast growth of 3.2%).

With more than 40% of European steel produced through the EAF process — where electricity is the primary energy source — high energy prices have seen a number of EAF mills curtailing or stopping production in response to price pressures. This includes one of Europe’s largest steel producers, ThyssenKrupp, announcing reduced working hours for its 1,300 steel workers from mid-April.

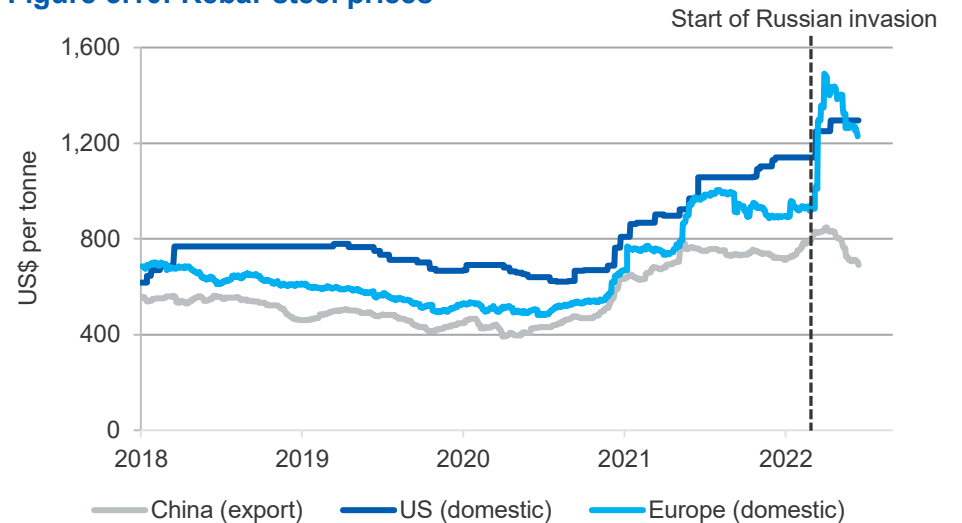
The conflict led to a substantial rise in European steel prices in March (Figures 3.9 and 3.10). While Hot-Rolled Coil (HRC) prices have eased in recent weeks, rebar prices remain elevated, and could constrain construction and activity in the region during H2 2022. Alongside energy price volatility, the conflict could also lead to further sanctions and actions by major economies, disrupting trade and economic activity in Europe.

**Figure 3.9: Hot-Rolled Coil steel prices**



Source: S&P Global Platts (2022)

**Figure 3.10: Rebar steel prices**



Source: S&P Global Platts (2022)



The Euro area continues to be heavily affected by the global semiconductor shortage, with the conflict in Ukraine — where 50% of the world's supply of neon is sourced — likely to further impact semiconductor manufacturing through to 2023. New shortages of critical components are also continuing to emerge as a result of Russia's invasion of Ukraine. Companies such as Porsche and BMW were forced to idle some production from March this year, given a shortage of wire harnesses typically supplied from Ukraine. Collectively, these issues are expected to see around 2 million less cars produced in Europe in 2022 (compared with forecasts from December last year), a reduction of more than 10%.

The Eurozone is now forecast to experience a 3.3% fall in total steel production in 2022 to reach 147 million tonnes. Over the outlook period to 2024, steel output is forecast to rise to 151 million tonnes in 2023 and 153 million tonnes in 2024 (Figure 3.11).

US steel production fell by 1.6% year-on-year in the five months to May 2022, and remained around 7.4% lower than the same period in 2019.

Following an easing in US HRC prices from record highs in September last year, Russia's invasion of Ukraine again tightened supply and led to a significant rise in prices (particularly long products) from March (Figure 3.9). Domestic mill capacity utilisation rates have fallen slightly since the start of 2022, to reach over 80% in June. US imports of semi-finished steel products from both Russia (due to unofficial sanctions) and Brazil (due to quota agreements) have fallen sharply (down 30% year-on-year in the year to May). At the same time, there has also been a growing shift to imports of finished steel products (up 36% year-on-year in the year to May) from major producers such as Canada and Mexico.

US supply chain disruptions — such as the semiconductor shortage — look set to continue into the second half of 2022. As a consequence of the disruptions, in April, IHS Markit forecast around 500,000 less units to be produced in the US compared with expectations in December last year. This includes a recent announcement by Toyota (in May) of a further 30,000 unit cut to its North American production (bringing its total 2022 estimate for lost production to between 177,000 to 192,000 units).

US steel production is now forecast to grow just 1.2% in 2022. Despite the short term challenges, the US is expected to maintain growth of around 2.3% annually over the rest of the outlook period to 2024. This will support implementation of the US\$1.2 trillion Bipartisan Infrastructure Framework (BIF), which includes US\$550 billion in new federal government investment in roads and bridges, rail, water and electrical infrastructure.

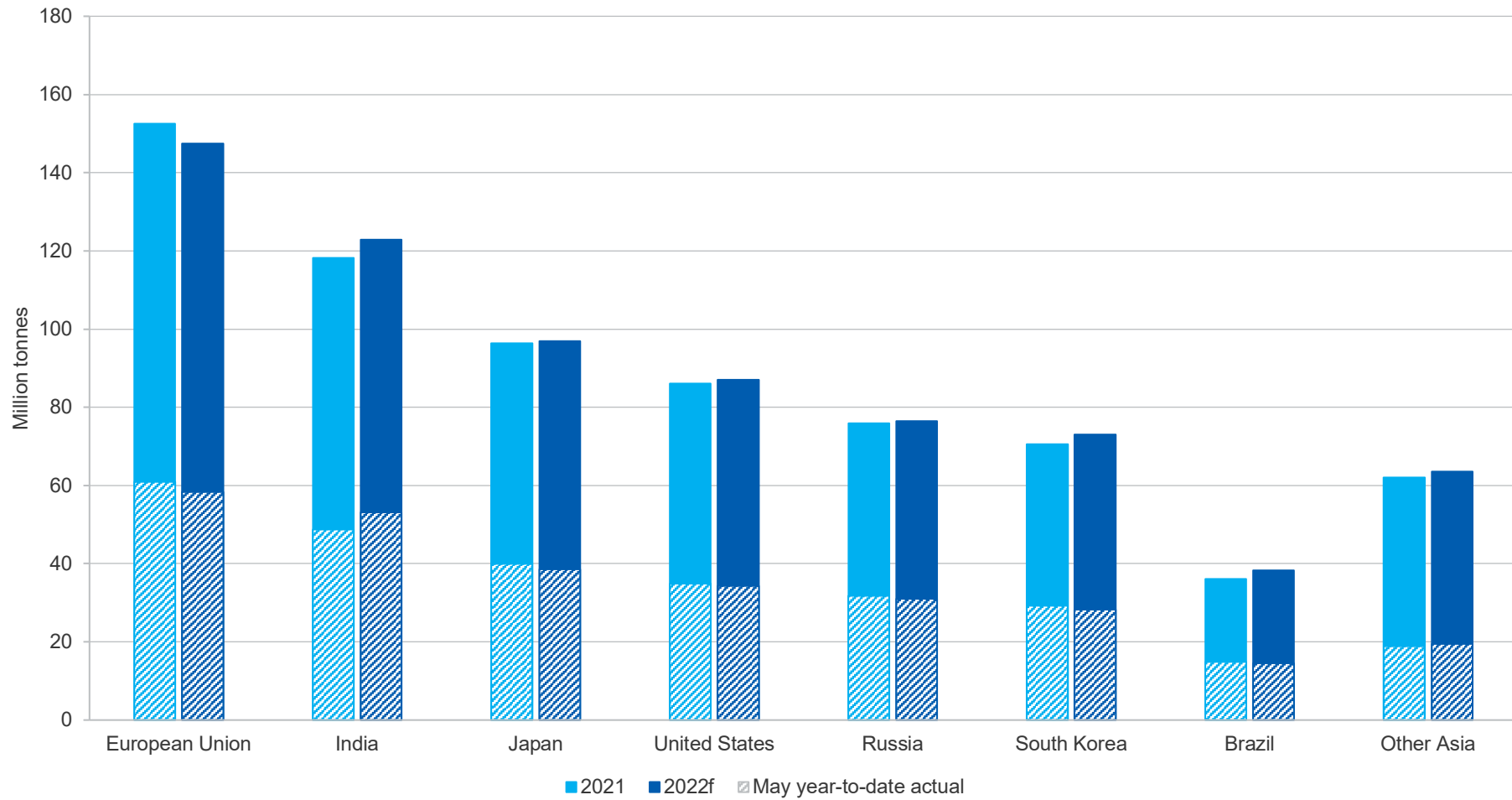
Indian steel output was about 53 million tonnes in the five months to May 2022, 9.1% higher year-on-year and 12% higher than the comparable period in 2019. Indian steel output is forecast to grow by 4.0% in 2022 (to 123 million tonnes), as part of the Indian Government's target to double national steel production capacity to 300 million tonnes by 2030–31 (from 144 million tonnes now).

However, India's coal shortages and recent heatwaves present a growing risk to this outlook. Thermal coal accounts for around 70-75% of India's total power demands, and high import prices have led to dwindling stockpiles at India's power plants this year. With manufacturing firms having already experienced power cuts since April, the country's steel industry remains vulnerable to cuts in output for the rest of 2022.

Over the outlook period to 2024, India is projected to grow its steel output by around 5.0% annually. This is expected to be led by a significant increase in infrastructure spending in 2022, as part of the country's \$1.5 trillion National Infrastructure Pipeline to 2025. This is to include around US\$500 billion in the next financial year (starting April 1) for projects that include 25,000km of new national highway, 400 new trains and 100 cargo terminals. Construction is also forecast to grow at a double digit pace in India's 2022 fiscal year (April 2021 to March 2022), after a fall of 7.3% in fiscal year 2021.

Total steel production for South East Asian countries in the five months to May 2022 (19 million tonnes) was around 3.0% higher compared with 2021, and 19% higher compared with 2019. This region is expected to see strong growth in domestic demand for steel over the outlook, including from government-led infrastructure projects, and the continued development of export-oriented manufacturing capacity.

**Figure 3.11: Steel production – other major producers**



Notes: 2021 actual; f forecast

Source: World Steel Association (2022); Department of Industry, Science and Resources (2022)

**Table 3.1: World steel consumption and production**

Crude steel consumption	Million tonnes				Annual percentage change		
	2021	2022 <sup>f</sup>	2023 <sup>f</sup>	2024 <sup>f</sup>	2022 <sup>f</sup>	2023 <sup>f</sup>	2024 <sup>f</sup>
China	1,026	1,011	1,012	1,007	-1.4	0.1	-0.5
European Union	149	146	151	156	-1.9	3.1	3.1
United States	94	100	107	111	5.8	7.1	3.9
India	104	107	112	117	3.4	4.8	4.7
Japan	56	56	58	60	0.5	2.9	2.8
South Korea	51	52	53	54	1.5	3.0	1.1
Russia	49	49	51	53	0.5	3.1	3.1
Brazil	25	27	29	31	8.6	8.5	8.0
World steel consumption	1,959	1,968	1,990	2,012	0.5	1.1	1.1
Crude steel production	2021	2022 <sup>f</sup>	2023 <sup>f</sup>	2024 <sup>f</sup>	2022 <sup>f</sup>	2023 <sup>f</sup>	2024 <sup>f</sup>
China	1,033	1,028	1,026	1,018	-0.4	-0.3	-0.8
European Union	153	147	151	153	-3.3	2.6	1.1
India	118	123	130	137	4.0	6.2	4.9
Japan	96	97	97	96	0.6	0.3	-1.0
United States	86	87	90	92	1.2	3.6	2.2
Russia	76	76	76	76	0.6	0.0	-0.2
South Korea	71	73	75	77	3.5	2.7	2.4
Brazil	36	38	40	41	6.2	3.9	3.6
World steel production	1,951	1,962	1,988	2,010	0.6	1.3	1.1

Notes: e Estimate; f Forecast; r Compound annual growth rate

Source: World Steel Association (2022); Department of Industry, Science and Resources (2022)