Steel

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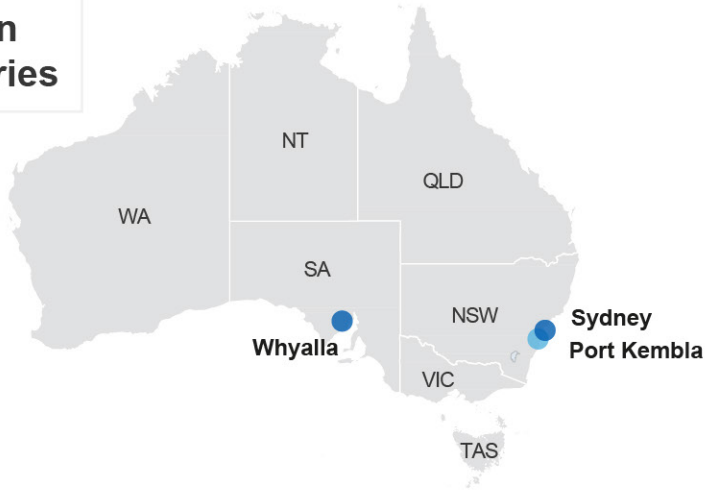
Australian steel refineries



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

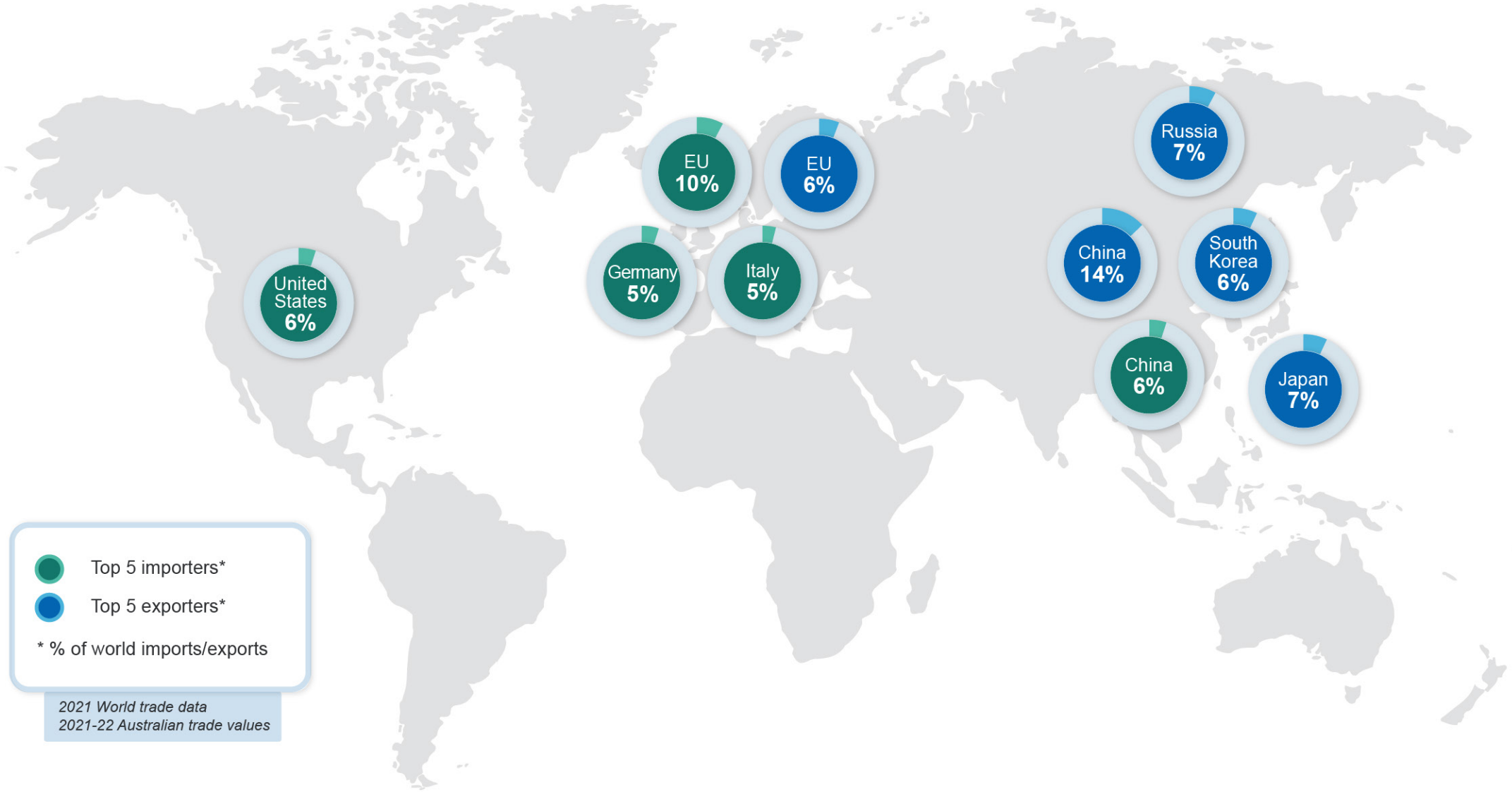
- **52%** Construction
- **16%** Mechanical machinery
- **12%** Other applications
- **12%** Automotive
- **5%** Other Transport
- **3%** Electrical Equipment

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 | September 2022



3.1 Summary

- World steel production fell 5.1% (year-on-year) in the first half of 2022. This followed new outbreaks of the COVID-19 pandemic in China, as well as ongoing weakness in its residential property sector. Energy shortages — intensified by the fallout from Russia's invasion of Ukraine — are also weighing on activity in other major steel making nations.
- With growing signs of weak global economic growth, world steel production is forecast to fall 0.7% in 2022. This will be driven by current fragility in China's residential construction sector, and global industrial production more broadly.
- Global steel output is expected to rebound to growth of 1.3% in 2023 and 1.1% in 2024, with large infrastructure rollouts planned or underway in a number of major economies. However risks remained skewed to the downside, with a more pronounced global slowdown or persistent energy shortages further threatening industrial production over the outlook.

3.2 World consumption and production

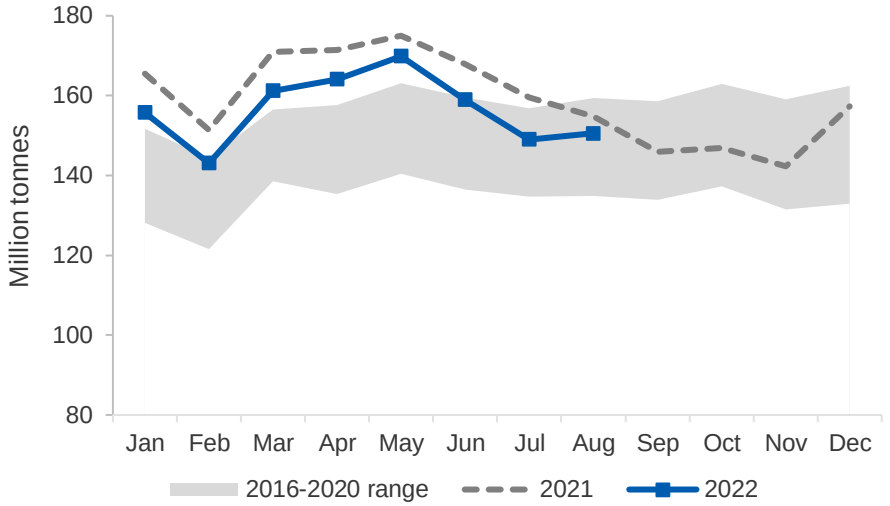
Global steel production to fall in 2022 on faltering demand

World steel production in the first half of 2022 was around 952 million tonnes. This was 5.1% lower year-on-year (Figure 3.1), though remained close to 10% higher than the average for the period 2016 to 2020.

The slowing global recovery anticipated for 2022 has been further burdened in recent months by a number of critical shocks. Persistent inflationary pressures have seen financial conditions tighten across a number of major economies, with rising implications for global growth prospects. This has been further compounded by new outbreaks of the COVID-19 pandemic — particularly in China — and ongoing energy shortages (see *Macroeconomic Outlook chapter*).

In August, the JPMorgan Global Manufacturing PMI — a broad measure of current conditions in the global manufacturing sector — reached its lowest level (50.3) in over two years. This included a further weakening in new orders, and signals a likely contraction of industrial activity and steel output in the near term (Figure 3.2).

Figure 3.1: Global monthly steel production



Source: World Steel Association (2022)

Figure 3.2: World manufacturing PMI and industrial output

Notes: JPMorgan Global Manufacturing Index; a reading above 50 indicating an overall increase compared to the previous month, and below 50 an overall decrease

Source: World Steel Association (2022); S&P Global (2022); Bloomberg (2022)

Further outbreaks of the pandemic in China from March — combined with the nation's 'dynamic zero' COVID policy — saw economic growth slow to 0.4% year-on-year in the June quarter 2022. This was China's weakest growth in 2 years, and led to a substantial downgrade to the IMF's forecast of 2022 Chinese GDP growth. The slowdown has been exacerbated by China's deteriorating property sector, with construction starts and new home sales continuing to show double-digit annual falls in August.

The fallout from the Russian invasion of Ukraine continues to impact steel production amongst other major producers, particularly Europe. This is due to the region's heavy reliance on Russian energy. Further mandated cuts to gas consumption, or an extended northern hemisphere winter, raises the risks of additional cuts to EU industrial production over the rest of 2022 (see *Gas chapter*). Ukraine is also expected to produce less than half of its 2021 steel output this year due to lost capacity from the invasion.

With the world economy now forecast to slow to growth of 3.2% this year, global industrial production and steel output are expected to see a comparable slowdown for the rest of this year. Global steel production is expected to fall by 0.7% for the full year 2022.

Among the major producers, China is expected to see a fall in steel output this year, consistent with weaker domestic demand and the central government's crude steel production curbs. Other producers such as the EU, Japan and South Korea, are all also expected to register falls in steel output in 2022, owing to critical energy shortages and slowing demand. Conversely, India is expected to produce about 7 million tonnes more than in 2021, with healthy growth in its construction sector expected for 2022.

Over the outlook period (to the end of 2024), stimulus-related infrastructure projects and a recovery in industrial production are expected to see growth in steel demand rebound, though at more modest levels than 2021. World steel production is projected to grow by 1.3% in 2023 and by 1.1% in 2024 to reach 1.98 billion tonnes.

Construction resilient despite weaker aggregate demand for steel

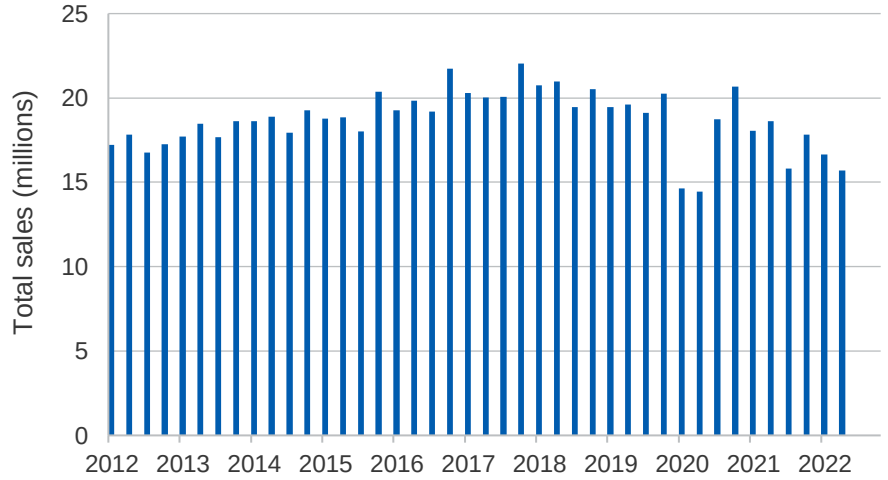
Global steel consumption is forecast to fall by 0.6% in 2022 — a 1.1 percentage point reduction from the June 2022 REQ forecast.

In July, the IMF downgraded its forecast for global growth in 2022 from 3.6% to 3.2%. This reduction was based on continued fallout from the Russian invasion of Ukraine, a worse-than-anticipated slowdown in China, and continued price pressures across major economies including the US and China (see *Macroeconomic Outlook chapter*).

Global construction activity slowed in the June quarter, particularly in Europe, and parts of the Asia Pacific. This followed mounting macroeconomic headwinds, as well as the persistence of rising input costs and critical raw material shortages. Despite the challenges, the outlook for the next 12 months remains upbeat, especially for infrastructure spending, particularly in regions such as the Americas, Middle East and Africa.

Following a challenging 2021, the automotive sector has continued to face disruptions, with COVID-related supply chain shortages further aggravated by fallout from the Russian invasion of Ukraine, and recent outbreaks of the pandemic in China. This led to global auto sales in the June quarter reaching their lowest levels in over two years (Figure 3.3).

Figure 3.3: Global auto sales, quarterly



Source: Bloomberg (2022)

Revised 2022 forecasts from S&P Global in July show some optimism for light vehicle sales in China (revised up 1.7%, 407,000 units) and South Asia (up 2.7%, 225,000 units), but weaker output is now expected for both Europe and South America. The sector also faces further near-term risks to demand destruction from growing global economic headwinds.

Over the outlook period, global steel consumption is expected to grow by 1.2% in 2023 and 1.1% in 2024, as COVID-related containment measures are removed, and global supply chains improve.

Chinese steel demand still facing weak property sector in H2 2022

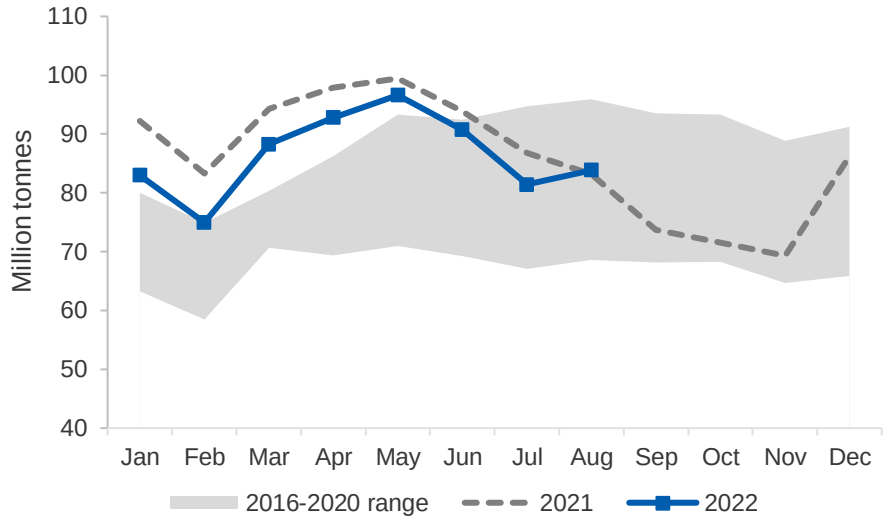
China's total steel output in the first half of 2022 was around 526 million tonnes. This was 6.2% lower year-on-year, but 16% higher than the comparable average for the period 2016 to 2020 (Figure 3.4).

The fall in output so far in 2022 reflects winter production curbs in place in northern provinces (to mitigate pollution) during the March quarter; renewed COVID-19 lockdowns across many cities from the June quarter; and significant weakness in China's residential property sector.

China's real estate sector — which typically accounts for around 35-40% of the country's total steel consumption — has continued to weaken throughout 2022. Housing starts in the year-to-August were down 37% year-on-year, while new home sales over the same period were down 21% year-on-year (Figure 3.5). In August, home prices (China's 70 large and medium-sized cities index) also fell for a 12th straight month.

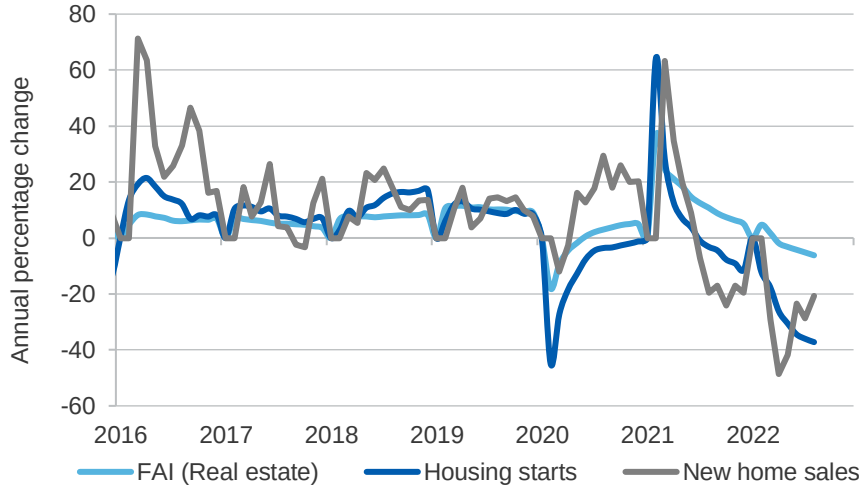
Pessimism surrounding China's residential property market has seen fixed asset investment (FAI) in real estate fall 6.2% year-on-year in the year-to-August, intensifying financing pressures on many of the country's property developers. Frailty in the sector has spread to Chinese households, with the emergence in recent months of a mortgage boycott movement for a number of stalled projects in China. In August, as many as 320 projects in 100 cities were reported to have seen homeowners threatening to withhold mortgage payments from banks, with growing concerns about the completion of these projects. These fears could translate into further weakness in housing pre-sales in coming months, adding to liquidity pressures of Chinese property developers.

Figure 3.4: Chinese steel production, monthly



Source: World Steel Association (2022)

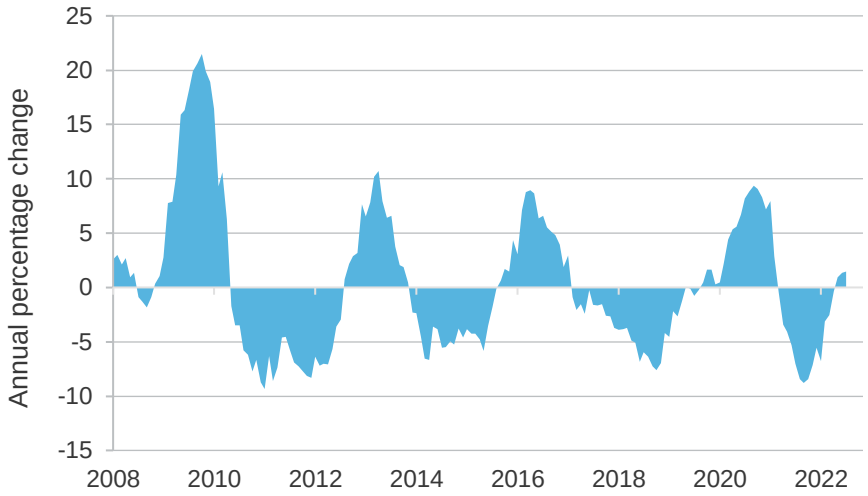
Figure 3.5: China's residential property sector



Notes: Housing starts measured by cumulative million square metres in each calendar year; New home sales measured as sales of residential buildings in CNY trillions each month

Source: NBS (2022); Bloomberg (2022)

Figure 3.6: China credit impulse



Notes: China credit impulse measures new loans as a percentage of GDP
Source: NBS (2022); Bloomberg (2022)

Figure 3.7: China's infrastructure investment

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

Chinese policymakers are continuing to try and stabilise the sector and ensure the completion of existing projects. In July, China's Politburo announced guidance for local governments to ensure the completion of unfinished homes, and more than 30 cities have introduced policies aimed at relaxing purchasing restrictions for multi-child homes. And in late August, China's State Council announced a new 19-point policy package (in addition to a 33 point policy package announced in May) aiming to respond to the country's current economic challenges.

The People's Bank of China (PBoC) has also announced plans to establish a real estate fund to provide as much as RMB 200 billion (US$45 billion) in low interest loans to complete stalled developments. These funds would be issued to commercial banks with the option to leverage as much as RMB 1 trillion (US$150 billion) in lending to embattled developers for completion of existing projects.

China banking on easier credit conditions and new infrastructure

In response to the housing downturn, and with the country experiencing new COVID-19 outbreaks and weakening domestic activity, Chinese policymakers have sought to ease broader monetary conditions in recent months. In August, the PBoC cut the Medium-Term Lending Facility Rate, leading to falls in both the one- and five-year Loan Prime Rates. This is the third reduction in the 5-year Loan Prime Rate (the benchmark rate for most mortgages) this year.

There are some signs of a new credit upcycle, with China's credit impulse — a measure of new loans as a percentage of GDP — turning positive in June (Figure 3.6). However, lending data for July shows much of this was from local government borrowing (rather than households). This suggests government efforts to stabilise the property sector and stimulate household spending will remain an ongoing challenge moving into the second half of 2022.

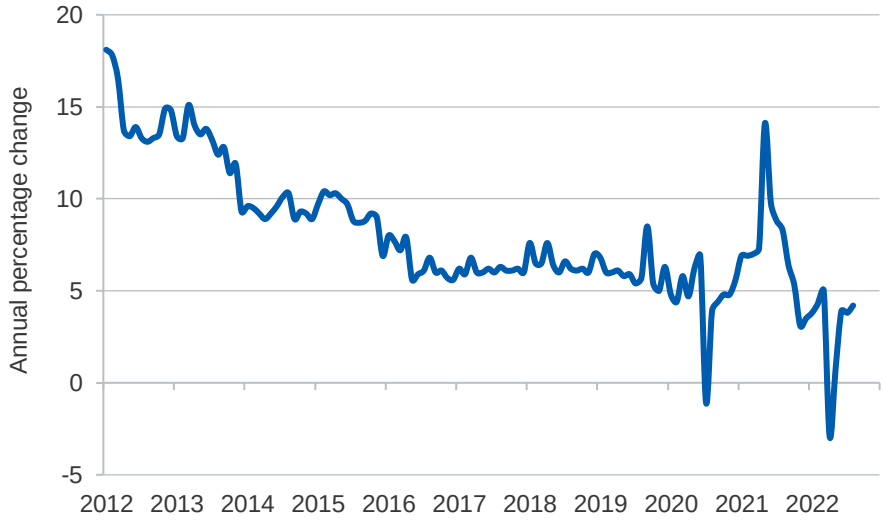
Infrastructure investment — representing 20-25% of the country's total consumption of steel — has seen a significant ramp up so far in 2022, with more than 90% of this year's quota of local government special purpose bonds (RMB 3.4 trillion or US$500 billion) already allocated in the first half

of the year. In August, China's infrastructure investment (3 month average) was around 13% higher year-on-year (Figure 3.7).

With China's economy growing just 0.4% in the June quarter, the central government has announced a number of new policies that could see total infrastructure spending rise to more than RMB 7 trillion (US$1 trillion) in 2022. This spending is expected to boost construction activity in the December quarter 2022 and into 2023. However, it is unclear if the stimulus will fully offset continued weakness in China's property sector.

China's manufacturing sector is also a major steel user, and also faces a challenging finish to 2022. Continued outbreaks of the pandemic and subsequent lockdowns have stifled domestic consumption in recent months (with retail sales growing just 2.7% year-on-year in July), as well as industrial production (growth of just 3.8% year-on-year in July). In August, the country was also facing its worst heat wave in six decades, forcing power rationing in a number of southern provinces. This drought threatens to place further pressure on industrial output in coming months.

Figure 3.8: China's industrial production growth



Source: NBS (2022); Bloomberg (2022)

Russian invasion of Ukraine leads to large steel supply cuts

In the first half of 2022, Ukraine's steel production was 4.5 million tonnes. This represents a fall of around 58% (6 million tonnes) from the comparable period in 2021.

The capture of parts of Ukraine's eastern provinces by Russian forces has meant a loss of around 40% of the country's steelmaking capacity. Russia's control of the Black Sea has also restricted the export capability of major Ukrainian steel producers. While Ukraine's Ministry of Infrastructure has announced plans to increase throughput capacity of ports on the Danube, exports are expected to remain constrained in the near-term. As a consequence, Ukraine steel production is forecast to fall by more than 50% (12 million tonnes) in 2022, to reach 9 million tonnes.

Russian total steel production in the first six months of 2022 was 36 million tonnes, down 2.3 million tonnes (5.9%) year-on-year.

In early March, the EU agreed a fourth package of punitive measures against Russia, including an import ban on Russian exports of steel (which totalled around 3.2 million tonnes in 2020). Russian producers have continued to find alternative markets for these products, with heavy discounts attracting higher purchases in Turkey and Asia. However, the rising impact of sanctions on Russia appears to be driving weaker domestic economic activity in more recent months. Russia's industrial activity fell by 0.5% year-on-year in July, and new auto sales — a major end user of steel — fell by more than 60% year-on-year in the month of August.

Ukraine briefly became the largest supplier of iron ore to the EU in the June quarter. This followed Ukraine exporting excess domestic supply — due to steel capacity cuts — and Europe trying to replace lost Russian supply of pellets (around 8 million tonnes in 2021). However, ongoing logistical constraints around rail and barge capacity mean this jump in Ukraine-EU iron ore trade is likely to have been temporary. This has implications for EU-based steelmaking in H2 2022 (the destination for the majority of Ukraine's high-grade, 65% Fe pellets).

Ex-China steelmaking curbed by energy and materials shortages

In the first half of 2022, world steel output (exc. China) was 425 million tonnes. This was 2.4% lower than the same period in 2021, but 3.2% above the average for the period 2016 to 2019 (Figure 3.9).

Energy and raw material shortages have continued to impact manufacturing activity across many major economies so far in 2022. This has seen industrial production, particularly in the EU and Japan continue to trend lower over the year (Figure 3.10). The weakening global outlook in recent months has also seen a marked drop in steel prices across major markets, particularly flat products such as HRC (Figures 3.11 and 3.12).

European production facing critical energy shortages in coming months

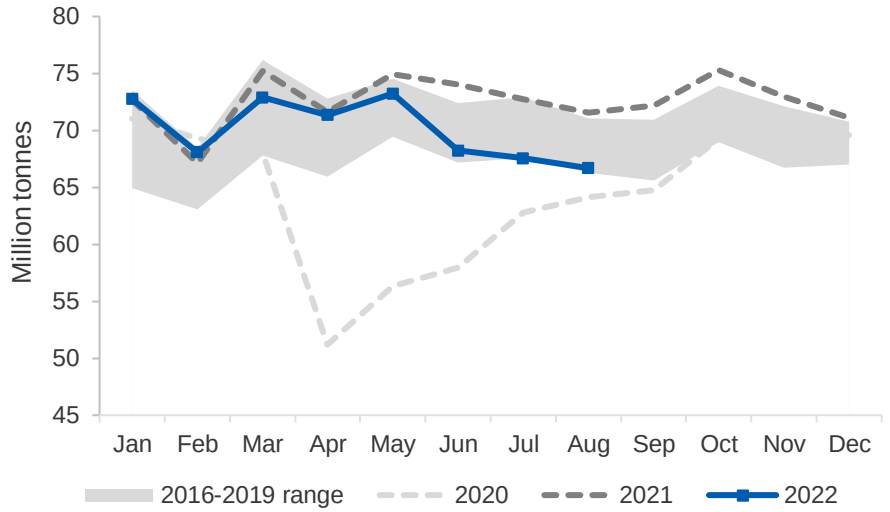
Steel production in the EU — the world's second largest steel-producing jurisdiction — fell 5.3% year-on-year in the first half of 2022 (and was also 4.6% below 2019 levels) to reach around 69 million tonnes.

Europe has continued to experience supply chain challenges and high energy prices throughout 2022, contributing to rising price pressures in the region. In July, the Eurozone Producer Price Index (PPI) was around 38% higher year-on-year.

These pressures have had deleterious impacts on steel-intensive industries in Europe, including its construction and automotive sectors. The S&P Global Eurozone Construction Total Activity Index registered a fourth straight month of contraction in August, with a reading of 44.2. This included significant falls in commercial and residential construction. Firms identified rising cost pressures and tighter financial conditions, as well as a markedly more downbeat outlook for the next 12 months.

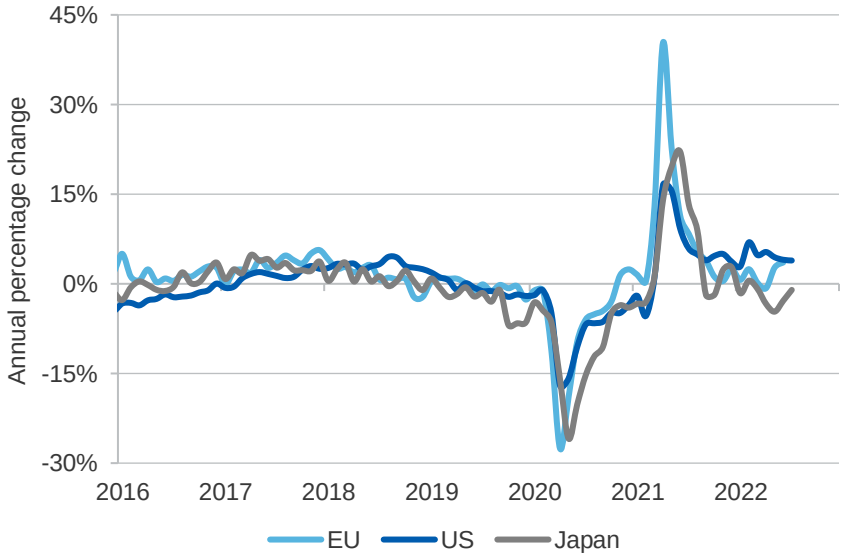
While the semiconductor shortage that heavily impacted producers in 2021 has shown some signs of easing, weaker demand and squeezed margins continue to limit any upside potential for European automakers in the short term. In July, S&P Global made further downward revisions (of around 200,000 units) to estimated light vehicle production for Europe in 2022.

Figure 3.9: Monthly steel production – Global (exc. China)



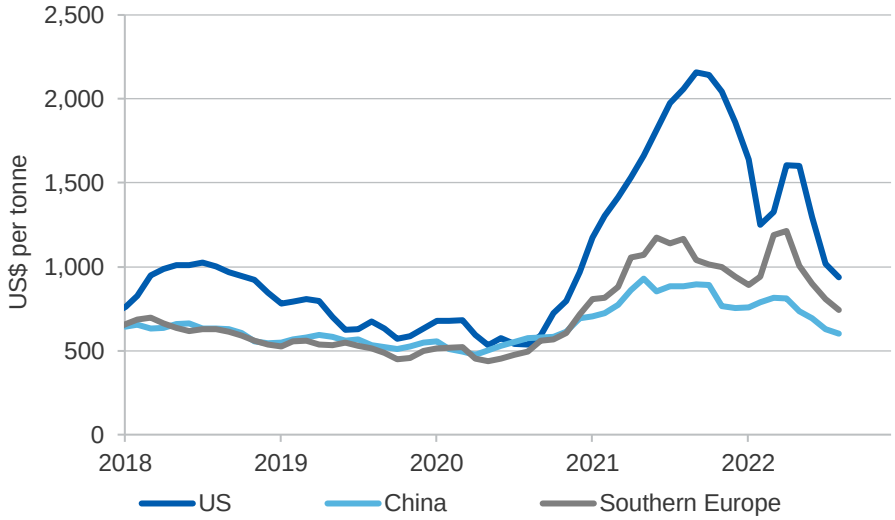
Source: World Steel Association (2022)

Figure 3.10: Industrial production — EU, US and Japan



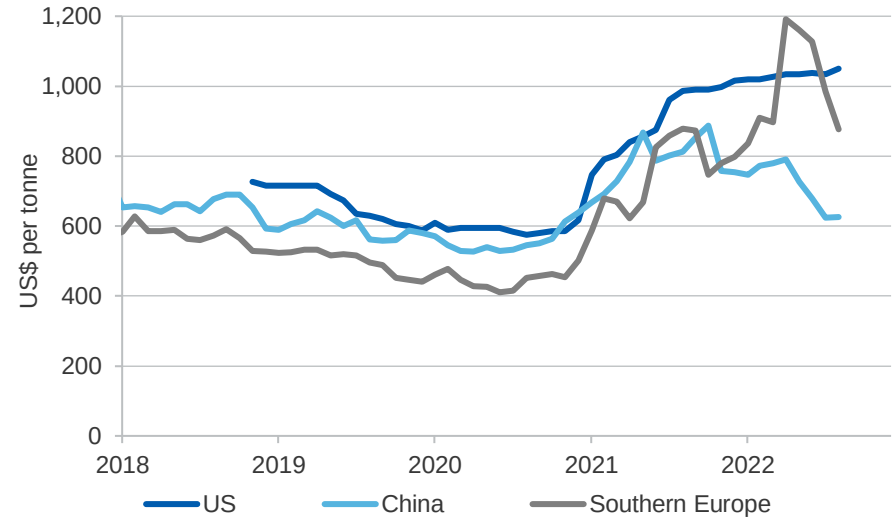
Source: Bloomberg (2022)

Figure 3.11: HRC steel prices



Source: Bloomberg (2022)

Figure 3.12: Rebar steel prices



Source: Bloomberg (2022)

Europe remains extremely vulnerable to energy shortages and rising electricity prices, with natural gas supplies from Russia now drastically reduced as the northern hemisphere winter approaches (see *Gas chapter*). This has seen EU energy ministers reach an agreement in late July for member countries to cut gas consumption by 15% from August 2022 to March 2023, and gas price caps now also being considered. The cutbacks are likely to see a material reduction in steel production in the region through to early 2023, where more than 40% of production is through an EAF process.

EU steel production is forecast to fall 9.9% in 2022 to total 137 million tonnes. Over the outlook period, steel output is forecast to see a rebound in 2023 to reach 144 million tonnes in 2023, and 147 million tonnes in 2024 (Figure 3.13).

Indian steel output growing in 2022 on strong construction activity

Indian steel output reached 63 million tonnes in the first half of 2022, a rise of 8.8% year-on-year. Total production is forecast to grow 6.1% in 2022 (to 125 million tonnes), in line with the Indian Government's target to double national production capacity to 300 million tonnes by 2030–31.

India's construction activity accelerated in the June quarter, particularly in its residential and commercial sectors. While the September quarter typically tends to see weaker activity (and steel demand) due to monsoonal rains, healthy growth is forecast for the full year 2022. Coal shortages remain a risk in the near term. Thermal coal accounts for around 70-75% of India's total power demands, and manufacturing firms have already experienced power cuts throughout 2022 to date. India has announced plans to import significant quantities of thermal coal in its 2022–23 financial year (April to March), in order to safeguard power sources this year. However, current high prices for thermal coal may hamper these efforts (see *Thermal coal chapter*).

Over the outlook period (to end 2024), India is projected to grow its steel output by around 5.5% annually. This will be led by healthy growth in residential and commercial construction, as well as a significant increase in infrastructure spending, as part of the country's $1.5 trillion National Infrastructure Pipeline to 2025.

Japanese manufacturing facing acute inflationary pressures

Japanese steel production in the first half of 2022 fell by 4.3% year-on-year and was 10% below the comparable period in 2019. This follows weaker demand from Japan's construction sector over the period, with total steel consumption in the June quarter down around 6.7%. Japan has also seen a weakening of its manufacturing sector in recent months, with industrial production down 1.2% year-on-year in July. The sector has been impacted by raw material shortages, and a weakening Yen which has seen growing cost pressures.

Japanese steel production is forecast to fall by 4.8% in 2022 to 92 million tonnes. Over the outlook, Japan's steel output is projected to remain relatively flat through to 2024.

US construction robust, while auto production shows first signs of rebound

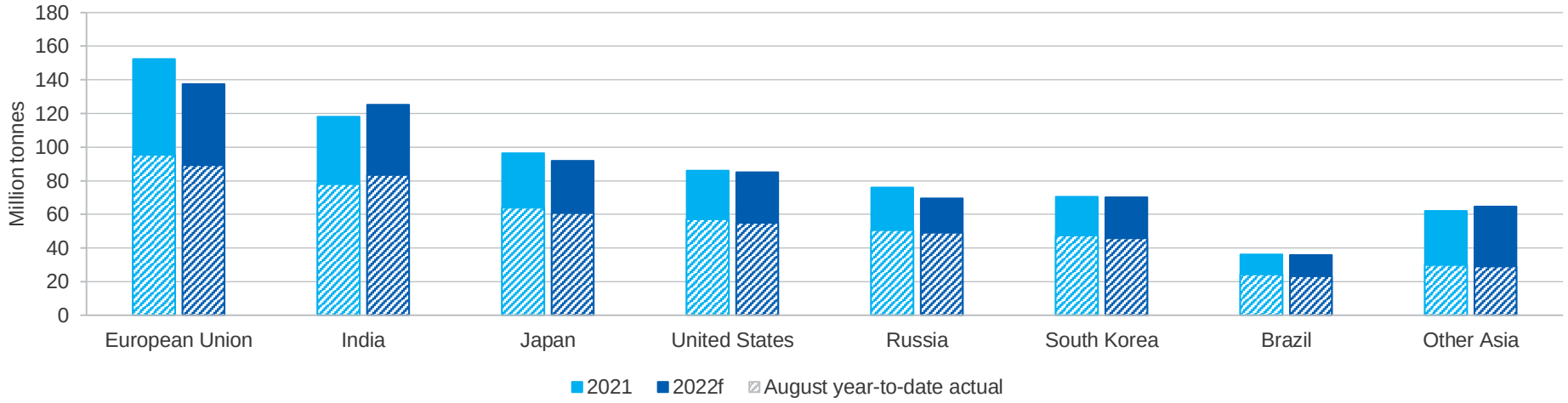
US steel production fell by 2.4% year-on-year in the first half of 2022, and remained around 7.4% lower than the same period in 2019.

Rebar prices in the US continue to hold at multi-year highs, reflecting strong activity in its construction sector. This includes robust growth across infrastructure, residential and non-residential construction. However, rising labour and materials costs, and higher interest rates remain a key risk for the rest of 2022 and over the outlook period.

The US auto industry has shown initial signs of recovery in July, with industrial production for the motor vehicles and parts growing by 6.6% month-on-month and 13.3% year-on-year. However, parts shortages remain expected to result in around 1 million less cars produced in the US in 2022, equivalent to 1 to 1.4 million tonnes less end demand for steel.

US steel production is now forecast to fall by 1.3% in 2022. Despite the short-term challenges, the US is expected to rebound in 2023, with average annual growth of around 2.9% to 2024 to reach 90 million tonnes. This is expected to support implementation of the US$1.2 trillion Infrastructure and Jobs Act, which includes US$550 billion in new federal government investment in roads and bridges, rail, water and electrical infrastructure.

Figure 3.13: Steel production – other major producers



Notes: 2021 actual; f forecast

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

Table 3.1: World steel consumption and production

	Million tonnes				Annual percentage change		
Crude steel consumption	**2021**	**2022[f]**	**2023[f]**	**2024[f]**	**2022[r]**	**2023[r]**	**2024[r]**
China	1,046	1,025	1,022	1,017	-2.0	-0.3	-0.5
European Union	155	144	148	152	-7.1	2.6	3.1
United States	94	101	108	112	6.8	7.2	3.9
India	104	111	116	121	7.1	4.8	4.5
Japan	56	56	57	59	-0.6	3.0	2.8
South Korea	51	51	53	53	0.4	3.2	1.1
Russia	49	47	45	44	-4.7	-3.1	-3.3
Brazil	25	27	29	31	7.5	8.7	8.0
World steel consumption	1,959	1,947	1,970	1,992	-0.6	1.2	1.1
Crude steel production	**2021**	**2022[f]**	**2023[f]**	**2024[f]**	**2022[r]**	**2023[r]**	**2024[r]**
China	1,033	1,020	1,017	1,009	-1.3	-0.3	-0.8
European Union	153	137	144	147	-9.9	4.9	1.8
India	118	125	133	139	6.1	6.1	4.9
Japan	96	92	93	94	-4.8	1.8	0.6
United States	86	85	88	90	-1.3	3.7	2.2
Russia	76	69	68	68	-8.6	-1.6	-0.4
South Korea	71	70	72	74	-0.7	2.7	2.5
Brazil	36	36	37	39	-0.7	4.1	3.8
World steel production	1,951	1,937	1,962	1,984	-0.7	1.3	1.1

Notes: **f** Forecast; **r** Compound annual growth rate

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