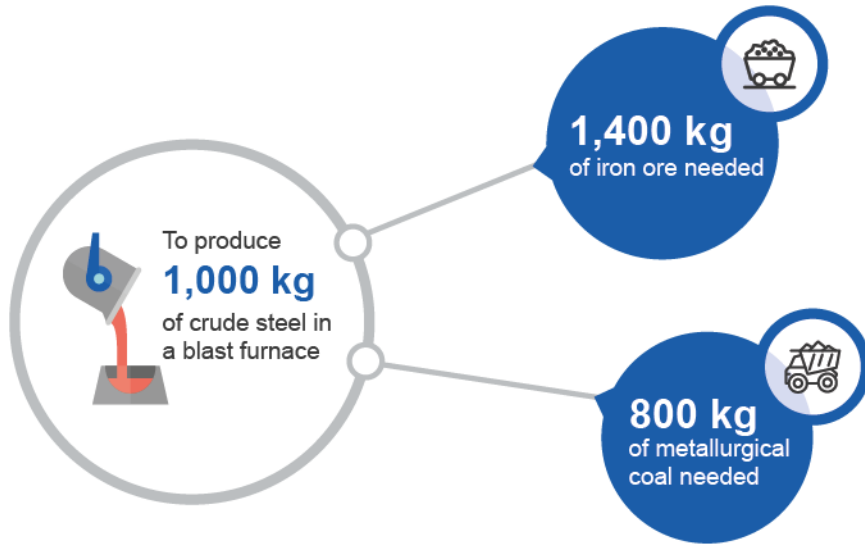
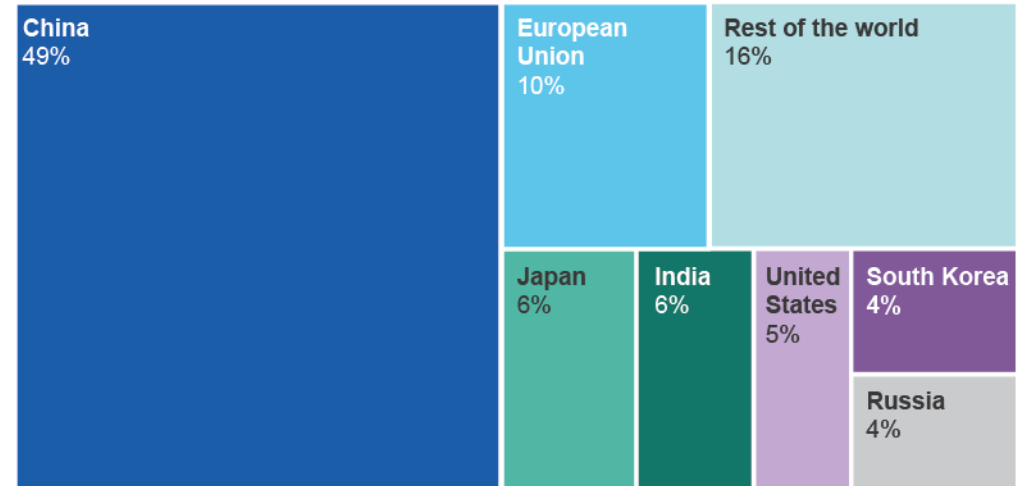


# Steel

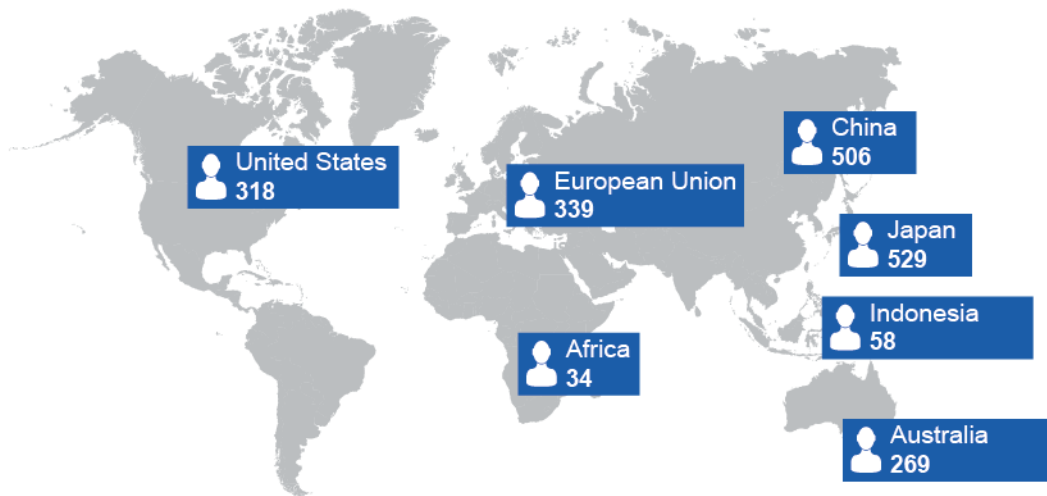
Resources and Energy Quarterly March 2018



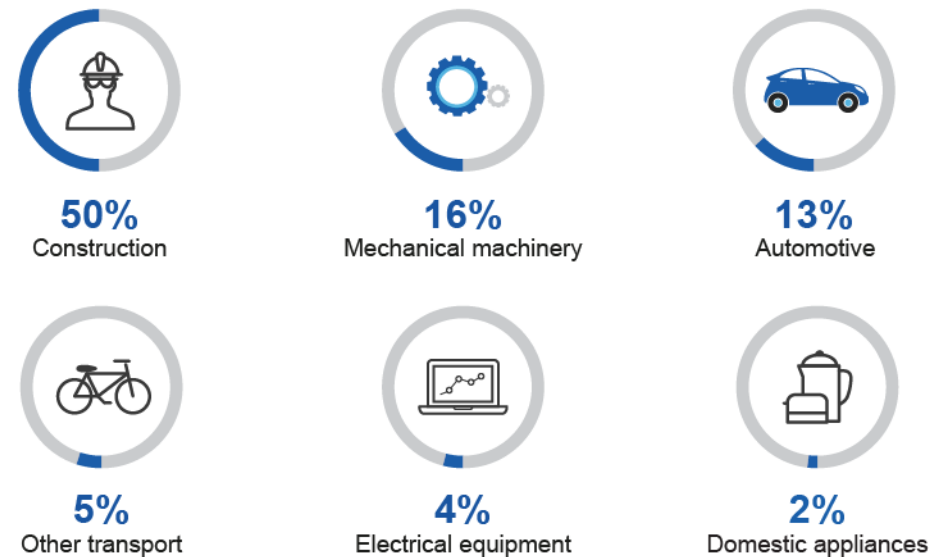
## Major steel producers, 2017



## Steel consumption per capita (kilograms per person), 2016



## Steel use by sector



### 3.1 Summary

- World steel production has been lifted by strong economic growth, an ongoing pickup in industrial production, and robust production in China.
- China's steel production and consumption is projected to gradually decline over the outlook period, reflecting a slow-down in construction activity, stricter environmental policies and supply-side reforms.
- India and other emerging economies are expected to increasingly drive growth in world steel consumption and production.
- The US tariff on steel imports and the threat of escalating protectionist policies presents a risk to the outlook for major steel exporting countries.

### 3.2 World consumption and production

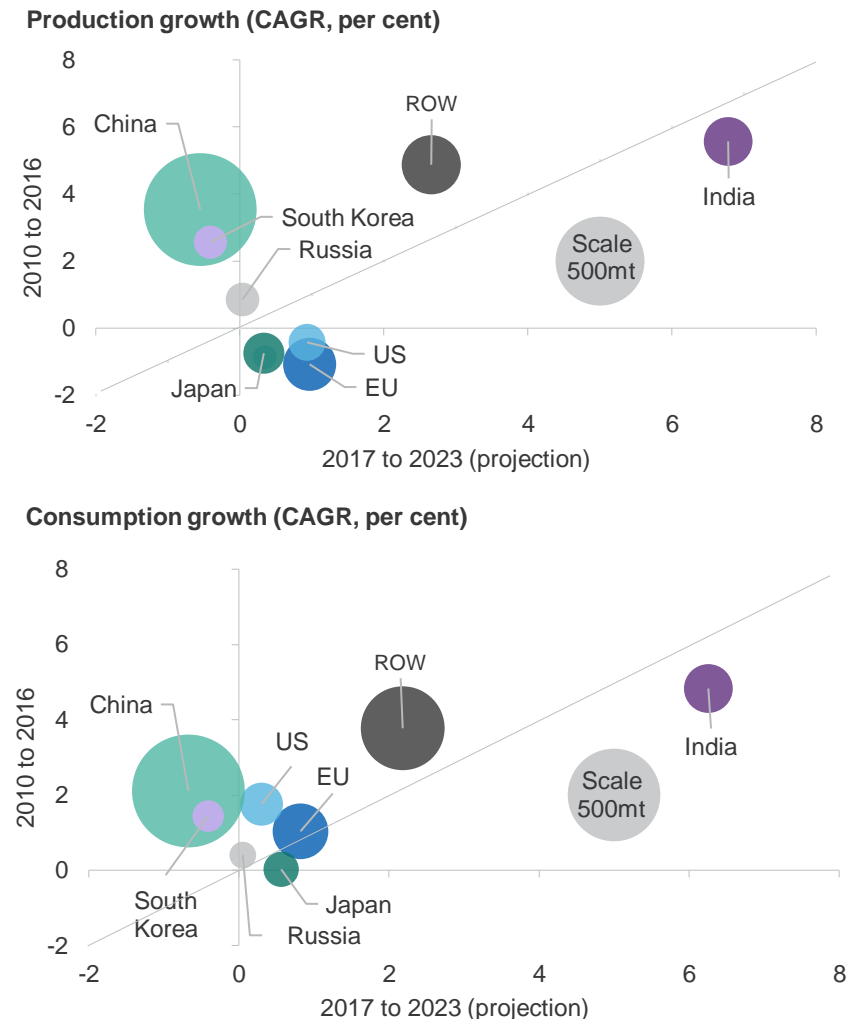
#### China's steel production boosted by high prices and strong demand

China's steel producers were buoyed by high prices and margins in 2017. Higher prices reflected capacity cuts, the closure of illegal induction furnaces, and stockpiling on concerns over supply shortages (stemming from production restrictions over winter).

Despite these supply constraints, Chinese steel output grew by 5.7 per cent to reach a record 832 million tonnes in 2017, representing 49 per cent of world steel production. The growth reflects higher rates of capacity utilisation — in response to high margins — and the replacement of previously unreported production (at illegal induction furnaces) with new production (captured by official statistics). Higher output was absorbed by strong domestic demand, due to robust industrial production growth and stimulatory government spending and policies.

Capacity reductions are expected to continue, with another 30 million tonnes of capacity to be cut in 2018. Increasingly stringent policies to address air pollution are also expected, such as the extension of production restrictions in the Hebei province, and a repeat of production restrictions over the winter period — when air pollution is particularly intense. These factors are not expected to translate to substantial declines in total annual production in 2018, which is forecast to be broadly steady, due to higher capacity utilisation outside of the winter months.

Figure 3.1: Trends in world steel production and consumption



Notes: CAGR is compound annual growth rate. Area of bubble represents volume of steel production/consumption in 2023. Bubbles to the left of the diagonal line indicate decelerating growth in 2017 to 2023 relative to 2010 to 2016, while bubbles to the right of the diagonal line indicate accelerating growth.

Source: World Steel Association (2017), Department of Industry, Innovation and Science (2018)

China's steel consumption is also forecast to hold steady in 2018. Both industrial output and fixed asset investment growth accelerated in the first two months of the year, by 7.2 per cent and 7.9 per cent respectively. However, the pace of growth in China's land and home sales, and in newly started residential buildings, slowed over the same period. The impact of government efforts to cool the property market — including purchasing restrictions, caps on prices on new properties, and increased down payment requirements — saw property prices moderate in 2017. The property market is expected to remain subdued in 2018, weighing on steel consumption.

### China's steel production projected to gradually decline

Over the medium term, steel production is projected to flatten and gradually decline at an annual average rate of 0.5 per cent, to reach 805 million tonnes in 2023. This would reduce China's share of global steel production from 49 per cent in 2017 to 45 per cent in 2023.

The decline in steel production is expected to be driven by moderating consumption, and a continuation and consolidation of current government policies. These policies include stricter environmental regulations, supply-side reforms, a shift in focus from 'quantity to quality', and reducing debt.

China's steel consumption is forecast to decline at an annual average rate of 0.5 per cent to reach 742 million tonnes in 2023, largely driven by an expected slowdown in urban residential construction and infrastructure investment. Residential construction is expected to be weighed down by a projected slowdown in urban population growth and the effects of ongoing government policies to limit speculative investment in the property market. The pipeline of infrastructure projects is expected to thin, as the government shifts its focus away from investment-driven growth.

Growing demand from other sectors — appliances, automobiles and machinery — and a modest increase in steel exports is expected to partially offset the decline in construction activity.

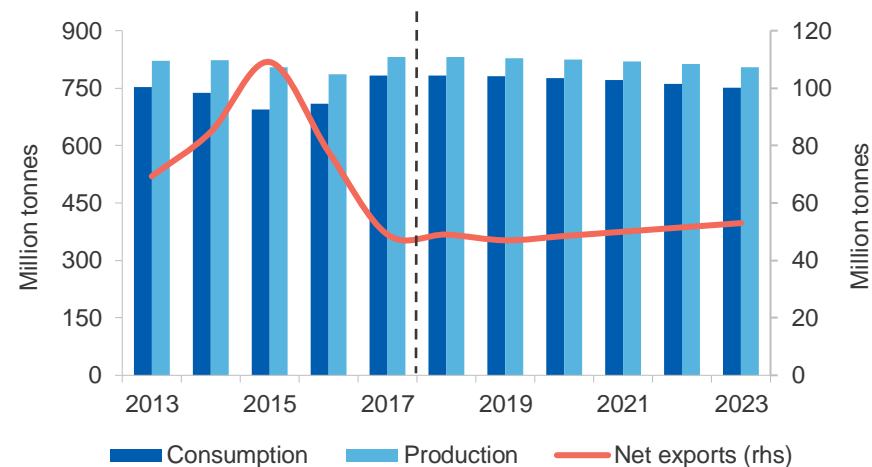
Steel exports decreased by 31 per cent in 2017 to 76 million tonnes, their lowest level in four years. Declining exports have been driven by higher

prices — making China's steel products less competitive on export markets, and to a lesser extent, the growing suite of trade barriers around the world. Nevertheless, exports are expected to pick up towards the end of the outlook period, supported by new trade routes opened up by the One Belt One Road Initiative and to meet growing demand from emerging economies, particularly in South East Asia.

The projection for China's steel consumption implies a levelling in China's steel intensity — the volume of steel consumed per person — and results in China following a different trajectory to Japan or South Korea (see Figure 1.3). Unlike these countries, which consume large amounts of steel in industries like automobiles and shipbuilding, China's development path is not expected to follow the same scale of steel-intensive export growth.

There is substantial uncertainty regarding the projections for China's steel sector. Government policy will continue to drive the outlook for steel, as authorities continue to adjust policies to manage a smooth transition while restructuring and reforming the economy.

**Figure 3.2: China's steel consumption, production and exports**



Source: Bloomberg (2018) World Steel Association; Department of Industry, Innovation and Science (2018)

### India set to become the second largest steel producer in 2018

India's steel production grew by 6.2 per cent in 2017, to 101 million tonnes, driven by the ongoing expansion of steel-making capacity. Domestic consumption — which grew by an estimated 5.2 per cent — has lagged production, in part due to the implementation of economic policies and reforms, such as demonetisation and the implementation of the GST. India's steel exports have surged as a result of subdued demand.

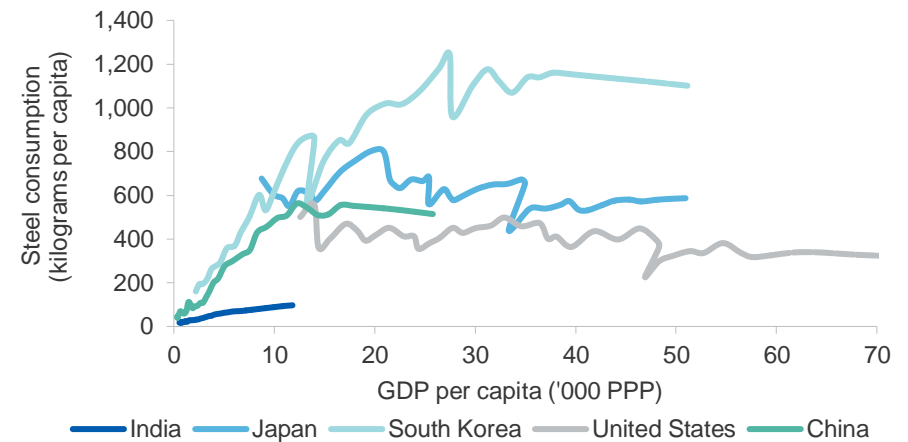
India's steel intensity was an estimated 73 kilograms per capita in 2017, well below China's 555 kilograms per capita, suggesting substantial potential for growth. Steel consumption is projected to grow at an annual average rate of 6.3 per cent to reach 140 million tonnes in 2023, implying a steel intensity of 97 kilograms per capita.

India's steel consumption will be underpinned by rapid urban population growth, substantial government investment in infrastructure, housing and urban development and the expansion of the manufacturing sector. The projection also reflects the expected impacts of structural reforms and other government policies, such as bank recapitalisation (an injection of capital into India's state-owned banks). These policies should improve prospects for economic growth and support the ability of state-owned banks to fund real estate, infrastructure and other steel-intensive projects.

Steel production is projected to grow at an annual average rate of 6.8 per cent over the outlook period. India is forecast to overtake Japan to become the world's second largest steel producer in 2018, with production reaching 108 million tonnes. By 2023, India's steel production is projected to reach 150 million tonnes, representing 8.5 per cent of world production.

The projections for steel production are lower than what is inferred in India's *National Steel Policy 2017*, which has targets for crude steel production to reach 255 million tonnes by 2030–31, implying an annual average growth rate of 7.4 per cent. Despite positive progress on political and economic reforms, the expansion of the steel sector faces hurdles from ongoing regulatory challenges and difficulty in accessing raw materials, land and finance. The *September 2017 Resources and Energy Quarterly* further explores prospects for commodities consumption in India.

Figure 3.3: Steel consumption intensity, 1980 to 2023



Notes: Dashed lines are forecasts for 2018 to 2023. Based on consumption of crude steel.  
Source: Bloomberg (2018) International Monetary Fund; World Steel Association (2017); Department of Industry, Innovation and Science (2018)

### Japan and South Korea's steel output to decline after short run strength

Japan's crude steel production remained steady at 105 million tonnes in 2017. Despite strong industrial production growth, the steel sector was affected by scheduled maintenance and technical glitches. Steel production is forecast to grow modestly in the short-term, supported by a rebound in capital expenditure, export growth in the automobile and manufacturing sectors, and demand from Olympics-related projects. Beyond 2020, crude steel production is projected to decline at an annual average rate of 0.8 per cent, due to a slowdown in the residential construction and automobile sectors.

South Korea's steel production grew by 3.7 per cent in 2017, supported by high prices, and is expected to remain stable in the short-term. Growth will be supported by robust domestic consumption, rising exports and a recovery in the shipbuilding industry — on the back of improvements in the number of new orders of ships. Over the medium term, steel production is projected to decline at an average annual rate of 0.5 per cent, weighed down by an expected slowdown in industrial production growth.

### Steel output in United States to be boosted by tariffs on imports

Steel production in the United States grew by 4.0 per cent to 82 million tonnes in 2017, and is forecast to grow by a further 5.4 per cent and 4.3 per cent in 2018 and 2019, respectively, supported by the proposed 25 per cent tariff on imported steel.

The proposed tariff on steel imports to the United States and the threat of escalating protectionist policies around the world, presents a risk to the outlook for major steel exporting countries — discussed further in Box 3.1.

### Emerging economies to increasingly drive steel demand growth

Steel production in the world excluding China grew by 4.9 per cent in 2017, the strongest rate in 6 years. This reflects growing momentum in global economic and industrial production, and a recovery in prices and profitability on the back of a sharp decline in steel exports from China.

Steel production in the world ex-China is projected to grow at a modest annual average rate of 2.1 per cent a year to 2023, driven by a positive outlook for global economic growth and ongoing urbanisation and infrastructure investment in emerging economies.

The ASEAN region offers one of the brightest prospects for growth in steel demand. Growth will be driven by rising construction activity and infrastructure investment in Vietnam, Malaysia, Thailand, Indonesia and the Philippines, and the potential development of the automotive industry in Thailand and Cambodia. Per capita steel consumption is notably low in Indonesia and the Philippines (59 and 108 kilograms per capita in 2016, respectively), reflecting substantial potential for consumption growth.

The region is currently a net importer of steel, with imports accounting for around 80 per cent of total apparent consumption. The region is projected to be a growing source of steel import demand from China, Japan and South Korea. Blast furnace capacity is also expected to grow in Vietnam and Indonesia, supporting demand for iron ore and metallurgical coal.

### Box 3.1: Impact of United States steel tariff on Australia's commodity exports

In March 2018, the Trump Administration signed a Proclamation which imposed a 25 per cent tariff on steel imports into the United States. The intent of the tariff is to increase capacity utilisation in the US steel industry to 80 per cent, up from current levels of 73 per cent. On preliminary estimates, this implies an additional 9 million tonnes of production, representing 0.5 per cent of world steel production.

There is substantial uncertainty regarding the implementation of the tariff, and consequently, its potential impact on Australia's commodity exports. The US is Australia's largest market for steel exports, but is not a significant export market for Australia's iron ore or metallurgical coal.

The impact of the tariff on iron ore and metallurgical coal markets depends on the extent to which the additional steel production in the US displaces production elsewhere in the world, particularly in Australia's key iron ore and metallurgical coal export markets. If the rest of the world absorbs the excess steel production, the effect on iron ore and metallurgical coal markets should be relatively minimal.

If the additional production in the US results in lower steel production elsewhere in the world, this could weigh on total world iron ore and metallurgical coal demand. Approximately 67 per cent of steel produced in the US is via the electric arc furnace (EAF) process, compared with 26 per cent for the world average. The EAF process uses less iron ore and metallurgical coal than the basic oxygen furnace (BOF) process.<sup>1</sup>

The potential for escalation in protectionist measures around the world represents another broader risk. Such outcomes could disrupt international trade and slow global economic growth in ways that are difficult to predict.

Notes: <sup>1</sup> For every tonne of crude steel produced, the EAF process uses about 0.016 tonnes of coal and varying amounts of direct reduced iron, depending on how much scrap is used. In contrast, every tonne of crude steel produced via the BOF process uses about 1.4 tonnes of iron ore and 0.8 tonnes of coal.

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

Crude steel consumption	Million tonnes							Per cent
	2017 s	2018 f	2019 f	2020 z	2021 z	2022 z	2023 z	CAGR r
European Union 28	172	175	177	179	180	180	181	0.8
United States	106	111	112	111	109	109	108	0.3
Brazil	22	23	23	23	24	24	24	1.4
Russia	42	42	42	42	42	42	42	0.1
China	772	772	770	766	760	752	742	-0.7
Japan	70	73	73	72	72	73	73	0.6
South Korea	59	59	59	59	59	58	58	-0.4
India	96	102	108	115	122	130	139	6.3
World steel consumption	1,699	1,722	1,737	1,747	1,757	1,766	1,772	0.7
Crude steel production	2017 s	2018 f	2019 f	2020 z	2021 z	2022 z	2023 z	CAGR r
European Union 28	168	172	176	178	178	178	178	1.0
United States	82	86	90	90	89	87	86	0.9
Brazil	34	34	34	34	35	35	35	0.3
Russia	71	72	72	72	72	72	71	0.0
China	832	832	827	825	820	813	805	-0.5
Japan	105	106	108	109	107	107	107	0.3
South Korea	71	71	71	70	70	70	69	-0.4
India	101	108	115	123	132	141	150	6.8
World steel production	1,691	1,717	1,736	1,745	1,755	1,765	1,773	0.8

Notes: r Compound annual growth rate for the period from 2018 to 2023; s Estimate; f Forecast; z Projection.

Source: World Steel Association (2018); Department of Industry, Innovation and Science (2018)