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The forecast has been prepared in accordance with [the General Principles of Socioeconomic Indicators Forecasting](#) of ACRA.

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Import-substitution prospects for Russian non-ferrous metals market

Non-ferrous metals market: 2023 outlook

- **The deficit in the global non-ferrous metals market, excluding nickel, will remain over the next five years.** Excess supply in the nickel market is due to the launch of new projects in Indonesia and Brazil, as well as the recovery of output in the Philippines. Despite growing production, the aluminum market will move into a deficit after 2021 because of rapid global consumption growth, provided that there are no significant negative consequences of the US-China trade war (an alternative scenario of the development of the non-ferrous metals market is given in *Appendix 1*). The lack of investment in copper and zinc mining, in turn, will not make it possible to ramp up their production to compensate for consumption growth. The Brazilian government's ban on upstream tailings dams used for storing mining waste will put additional pressure on the copper market. ACRA expects nickel prices to hold between USD 12,100 per metric ton and USD 13,000 per metric ton in 2019–2023, aluminum prices between USD 1,900 per metric ton and USD 2,100 per metric ton, copper prices between USD 5,900 per metric ton and USD 6,300 per metric ton, and zinc prices between USD 2,200 per metric ton and USD 2,500 per metric ton.
- **Growth potential in estimated EBITDA of Russian non-ferrous metals producers, buoyed by the expansion of import substitution, exceeds 10% compared with the 2018 level.** In a move to fight sanctions against United Company Rusal Plc, the Russian Ministry of Industry and Trade announced the launch of several projects in 2018 that are aimed at expanding domestic consumption of non-ferrous metals. As a result, aluminum consumption in Russia rose by 7.6% in 2018 from a year earlier, while copper consumption inched up by 1.8% over the same period, according to ACRA estimates. ACRA points to considerable potential for import substitution in the segment of these two metals: considering the difference in prices for final products and primary metal, the industry lost RUB 1.2 bln of EBITDA in production of rolled copper products in 2018 and up to RUB 13 bln of EBITDA in production of rolled aluminum products.
- **Lower metal prices will not affect the creditworthiness of Russian companies.** According to ACRA, the ability of the industry to service its loan liabilities will remain high. At the same time, demand growth for base metals could accelerate because of extra demand from renewable energy and electric car makers, which will further support the creditworthiness of Russian metal producers.
- **The importance of Russian companies for the global non-ferrous metals market reduces potential damage** to the industry in case foreign regulators impose new sanctions.

Table 1. Forecasted indicators for the Russian and global non-ferrous metals industry

Indicator	UoM	Act.			Forecast				
		2016	2017	2018	2019	2020	2021	2022	2023
Urals oil price	USD/bbl	42.3	53.9	70.0	63.6	58.7	60.2	61.7	63.2
RUB/USD exchange rate	RUB/USD	67.2	58.3	62.7	64.1	62.8	61.2	62.6	63.9
Global GDP	(%, y/y)	2.5	3.1	3.1	2.8	2.3	2.3	2.3	2.4
Population	mln	7,444	7,530	7,621	7,703	7,784	7,863	7,942	8,020
Aluminum, world	USD/t	1,611	1,980	2,108	2,015	1,936	1,987	2,042	2,097
Produced, world	mln tons	58.2	63.4	64.4	65.9	67.8	69.1	70.4	71.7
Consumed, world	mln tons	59.0	59.2	60.1	63.0	65.6	68.4	71.3	74.3
Aluminum market balance, world	mln tons	-0.8	4.2	4.3	2.9	2.2	0.7	-0.9	-2.6
Produced, RF	thousand tons	3,685	3,707	3,753	3,931	4,099	4,272	4,452	4,639
Apparent consumption, RF	thousand tons	832	865	931	1 043	1 130	1 205	1 251	1 309
Aluminum ingot, RF	RUB '000/t, VAT excl.	108	115	132	129	122	122	128	134
Copper, world	USD/t	4,871	6,194	6,500	6,133	5,911	6,027	6,144	6,228
Produced, world	mln tons	23.3	23.5	24.0	24.4	25.1	25.9	27.0	28.0
Consumed, world	mln tons	23.4	23.7	24.0	25.5	26.3	27.2	28.0	28.9
Copper market balance, world	mln tons	-0.1	-0.2	0.0	-1.1	-1.2	-1.3	-1.0	-0.9
Produced, RF	thousand tons	877	945	1,039	1,102	1,137	1,174	1,212	1,251
Apparent consumption, RF	thousand tons	282	285	291	305	313	322	331	340
Copper ingot, RF	RUB '000/t, VAT excl.	327	361	408	393	371	369	385	398
Zinc, world	USD/t	2,101	2,890	2,922	2,717	2,271	2,341	2,411	2,485
Produced, world	mln tons	13.6	13.3	13.3	14.0	14.3	14.6	14.9	15.2
Consumed, world	mln tons	13.9	13.7	13.7	15.3	15.8	16.3	16.8	17.3
Zinc market balance, world	mln tons	-0.3	-0.4	-0.4	-1.3	-1.5	-1.7	-1.9	-2.2
Produced, RF	thousand tons	255	257	255	182	187	193	199	205
Apparent consumption, RF	thousand tons	230	241	227	239	257	279	300	321
Zinc ingot, RF	RUB '000/t, VAT excl.	141	169	183	174	143	143	151	159
Nickel, world	USD/t	9,595	10,410	13,114	12,178	13,065	12,584	12,809	12,734
Produced, world	mln tons	2.0	2.1	2.2	2.4	2.5	2.6	2.7	2.8
Consumed, world	mln tons	2.0	2.2	2.1	2.2	2.2	2.3	2.4	2.5
Nickel market balance, world	mln tons	0.0	-0.1	0.1	0.2	0.3	0.3	0.3	0.3
Produced, RF	thousand tons	182	157	158	163	169	175	181	188
Apparent consumption, RF	thousand tons	27.1	27.7	28.5	28.9	29.3	29.8	30.1	30.4
Nickel ingot, RF	RUB '000/t, VAT excl.	645	607	822	781	821	770	802	814

Source: Australian Department of Industry, Innovation and Science, Bloomberg, IMF, FCS of Russia, Rosstat, corporate data, ACRA forecast

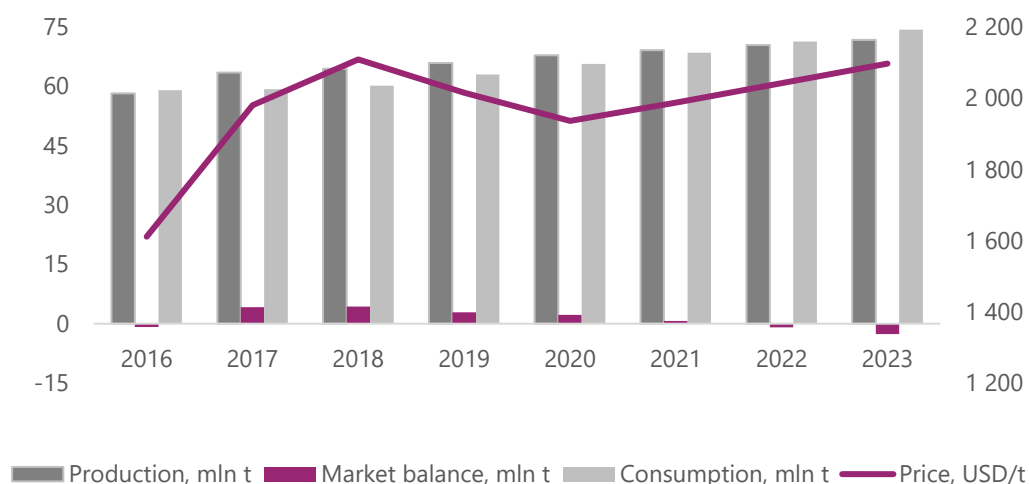
The significant role that UC Rusal plays in the global aluminum market (over 5.6% of global production) reduces potential losses of the Russian industry in case of new sanctions. As such, US aluminum consumers came to the Russian company's defense, fearing a sharp rise in aluminum prices should sanctions take full effect.

ACRA does not expect a significant reduction in the cost of aluminum production in China. Despite a decline in prices in the global thermal coal market (the Chinese aluminum industry mainly consumes electricity that comes from thermal power plants), the Agency does not forecast a sharp drop in coal prices in the Chinese market because local authorities will support loss-making production facilities. As a result, the cost of electricity in China will only slightly decrease.

Aluminum market will face deficit by 2022

The rise in aluminum prices in 2018 allowed many producers to boost production, including China, which accounts for half of the world's aluminum output. Total global aluminum production reached 64.4 mln tons in 2018, which led to excess supply that will remain in place until 2021. However, things could change to the opposite in 2022–2023 on the back of a rapid growth in global aluminum consumption. According to ACRA, potential market risks include the possibility of new sanctions on UC Rusal, which can significantly affect the global aluminum supply. The introduction of new US tariffs on imported aluminum will have a negative impact on consumption. ACRA expects a slight fall in average annual aluminum prices down to USD 1,900 per metric ton in 2020, followed by an increase to USD 2,100 per metric ton in 2023 as the global aluminum surplus vanishes.

Figure 1. Primary aluminum: global market balance



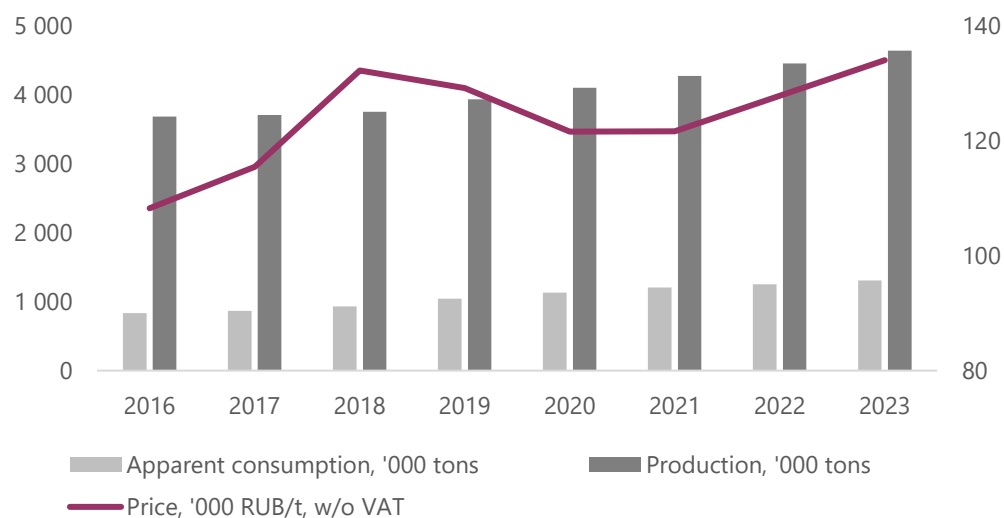
Source: Australian Department of Industry, Innovation and Science, Bloomberg, IMF, ACRA forecast

According to ACRA estimates, the possible introduction of tariffs on imports of aluminum products to Russia aimed at stimulating domestic production, as well as significant support of domestic demand (proposals to use aluminum in the automotive industry and construction) will provide additional capacity utilization for Russian companies that produce rolled metal products, boosting their financial results. According to the Aluminium Association, capacity utilization for production of rolled aluminum products in Russia totaled nearly 79% in 2018 (up three pps compared to the previous year). ACRA estimates suggest that total domestic aluminum consumption in Russia will exceed one mln tons in 2019.

The Russian market of rolled aluminum products showed great potential for import substitution, the further implementation of which can contribute to the growth of domestic aluminum consumption. In 2018, Russia imported more than 200,000 tons of value-added aluminum products worth more than USD 730 mln. According to ACRA estimates, the total losses of Russian producers of aluminum and rolled aluminum products average around 10% of the industry's 2018 EBITDA because of imports of value-added aluminum products. ACRA takes into account the need for some modernization of the rolling equipment of Russian

manufacturers of aluminum products. However, the Agency believes that the cost of manufacturing optimization is low compared to a shortfall in EBITDA.

Figure 2. Primary aluminum: Russian market balance

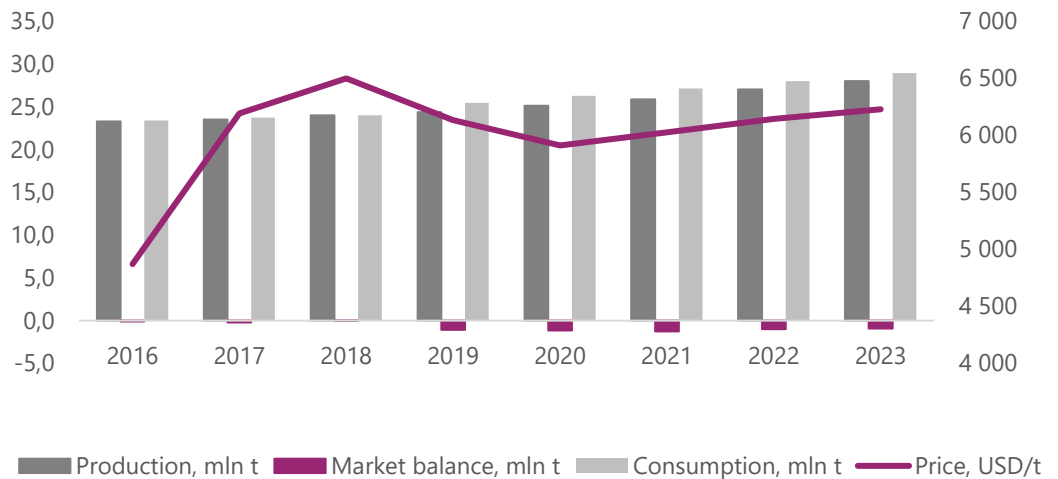


Source: Rosstat, FCS of Russia, corporate data, ACRA forecast

Copper market deficit will grow in next two years

ACRA expects the deficit in the global copper market to remain until 2023 as demand growth will continue to outpace the development of new production capacity. The market deficit will grow in the next two years due to, among other things, the Corrego do Feijao dam (owned by Vale) disaster in the Brazilian state of Minas Gerais. As one of the measures aimed at preventing such incidents in the future, the government of Brazil (around 1.2% of global copper production) banned the construction of new tailings dams used for storing mining waste and ordered the shutdown of all existing dams by 2021. The deficit in the global copper market will start to decline in 2022 due to the implementation of projects in Panama (Cobre Panama project — 375,000 tons per year), Australia, and India (a mine in the state of Madhya Pradesh, as well as the expansion of production in the states of Jharkhand and Rajasthan that will provide a total increase in production of around 160,000 tons per year). As a result, copper prices will be USD 5,900–6,300 per metric ton in 2019–2023.

Figure 3. Copper: global market balance

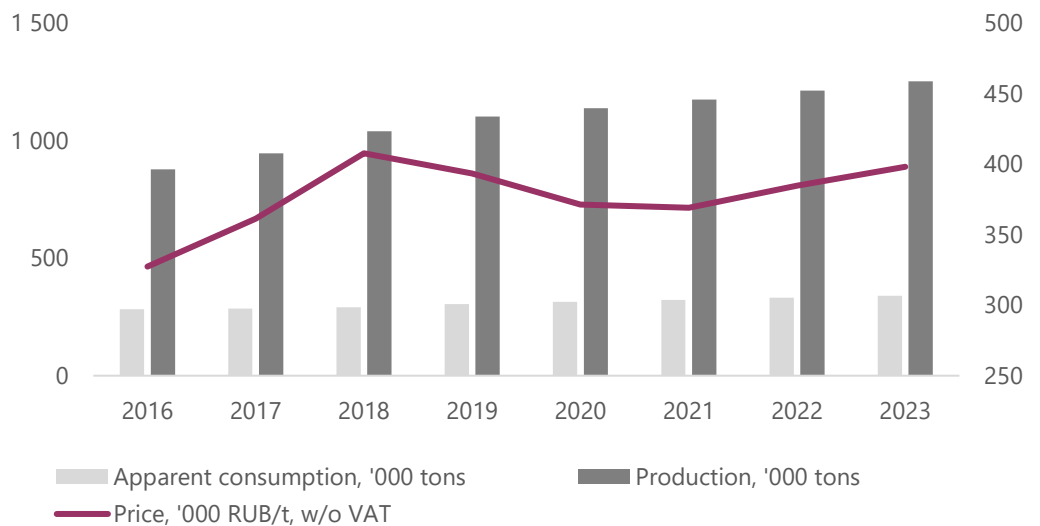


Source: Australian Department of Industry, Innovation and Science, Bloomberg, IMF, ACRA forecast

Low capacity utilization is the result of the price of rolled copper being just 5% higher than that of a copper cathode in 2017. Capacity utilization is gradually rising due to the increase in the added value of copper products. The added value averaged 6.5% in 2018 and around 14% in Q1 2019.

According to ACRA's forecast, copper consumption in Russia will gradually increase, reaching 340,000 tons by 2023 compared to 291,000 tons in 2018. The substitution of imports of copper pipes, fittings, and other types of rolled products will boost the total capacity of non-ferrous metal processing plants from 43% in 2018 to 60% by 2023. The biggest players in the Russian copper market lose nearly 15% of the industry's 2018 EBITDA because of imports of rolled copper products, according to ACRA estimates. Market participants note that the quality of Russian copper products is currently lower than that of foreign analogues, however, this gap can be narrowed by purchasing foreign rolling equipment.

Figure 4. Copper: Russian market balance

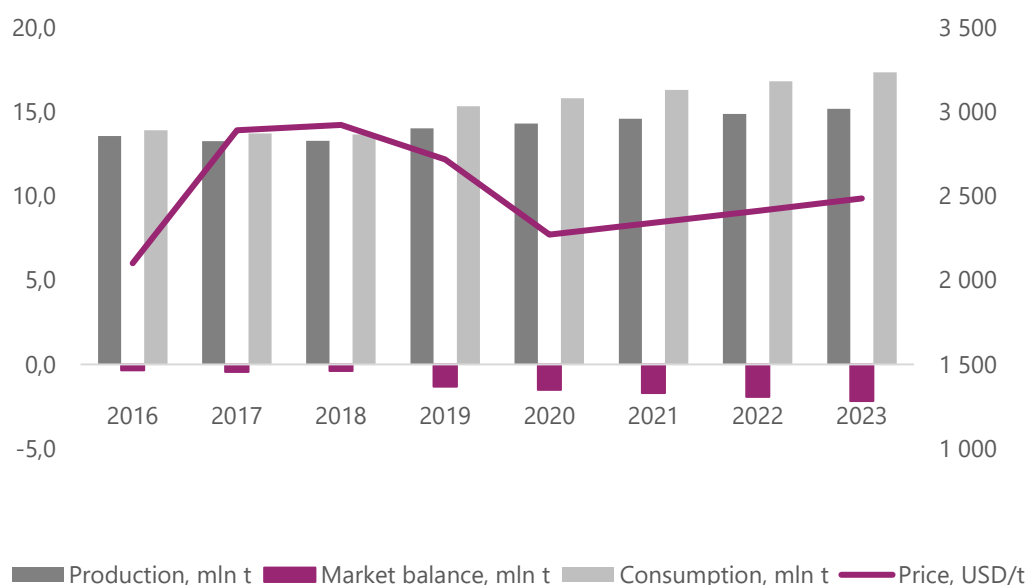


Source: Rosstat, FCS of Russia, corporate data, ACRA forecast

Zinc market deficit will remain until 2023 but will not affect prices

According to ACRA estimates, the zinc market will face a shortage until 2023, which is due to insufficient investment in mining and exploration in 2009–2017. It is worth noting, however, that the global shortage will no longer push prices up, as the significant price surges seen in 2016–2018 were largely due to speculative rather than fundamental factors, the impact of which has faded. In the future, the ongoing zinc mining projects in South Africa (Gamsberg mine, with 250,000 tons per year) and Iran (Mehdiabad mine, with 400,000 tons per year) will reduce the deficit. Therefore, ACRA expects zinc prices to decline to USD 2,200–2,500 per metric ton in 2019–2023.

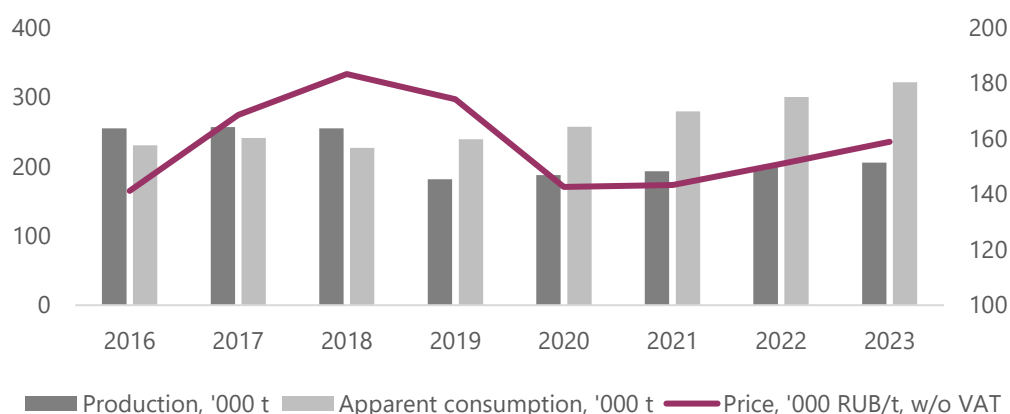
Figure 5. Zinc: global market balance



Source: Australian Department of Industry, Innovation and Science, Bloomberg, IMF, ACRA forecast

In Russia, zinc consumption amounted to 250,000 tons in 2018, and by 2023, according to ACRA's forecast, the consumption will increase to 300,000 tons. According to the Agency's estimates, zinc imports in Russia will significantly increase to 40,000 tons by 2019 (about 20,000 tons in 2018), while exports will decrease to 18,000 tons (about 48,000 tons in 2018) due to the conservation of the Electrozinc plant.

Figure 6. Zinc: Russian market balance



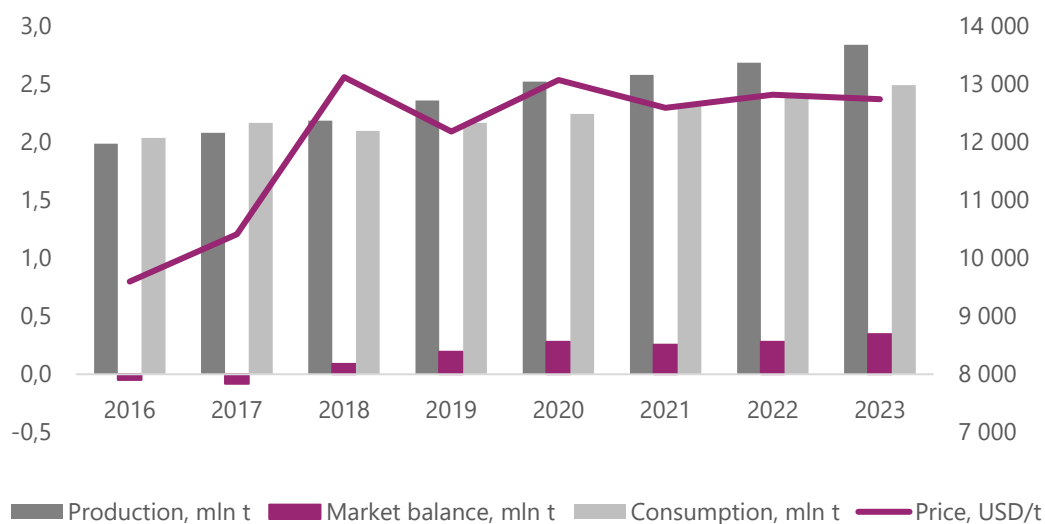
Source: Rosstat, FCS of Russia, corporate data, ACRA forecast

In October 2018, the Electrozinc plant owned by UGMK suffered a major fire. The owner decided to shut down the plant, a producer of over 70,000 tons of zinc a year.

Nickel to see market surplus for first time in many years

According to ACRA estimates, in 2019, for the first time in many years, the nickel market will experience a surplus, primarily due to an increase in metal production from Russian ore, the launch of projects in Indonesia and Brazil, and resumed operations in the Philippines. The surplus is expected to reach 300,000 tons, while nickel prices are expected to be in the range of USD 12,100–13,000 per metric ton in 2019–2023.

Figure 7. Nickel: global market balance



Source: Australian Department of Industry, Innovation and Science, Bloomberg, IMF, ACRA forecast

Appendix 1. Stress scenario of non-ferrous metals market development

ACRA believes that the base case scenario is the most probable for the non-ferrous metals market. However, in view of the growing tensions between China and the US, the Agency has evaluated the stress scenario for the market.

In contrast to the base case scenario, the stress scenario assumes much lower global metal consumption in 2019–2020. This may give rise to excessive supply in the market, which may push down prices and the demand from speculators.

In ACRA's view, some potential projects aimed at boosting the production of metals will not be fully implemented with some of them being suspended. This will affect production in 2021–2023 and, therefore, result in market shortages and higher prices.

Table 2. Forecasted indicators for the global non-ferrous metals industry

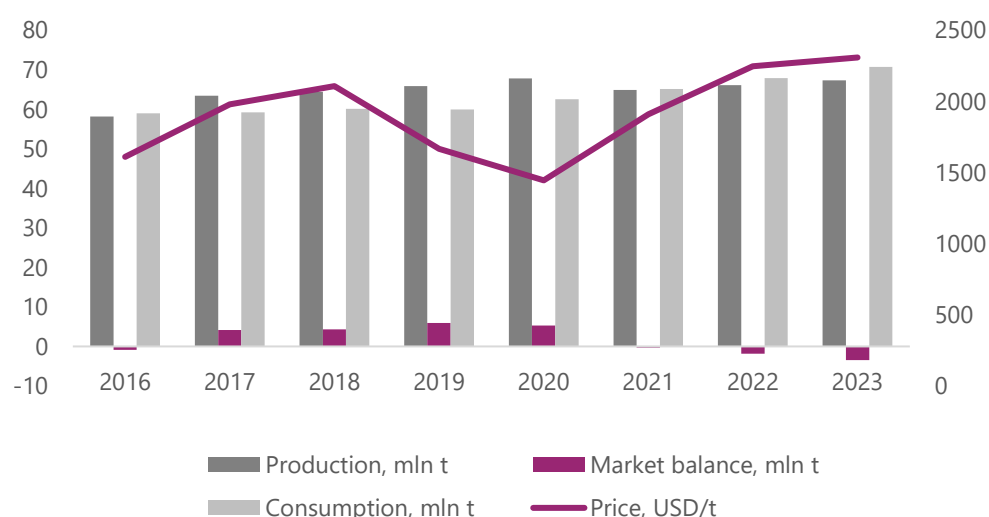
Indicator	UoM	Act.			Forecast				
		2016	2017	2018	2019	2020	2021	2022	2023
Aluminum	USD/t	1,611	1,980	2,108	1,666	1,445	1,909	2,248	2,309
Produced	mln t	58.2	63.4	64.4	65.9	67.8	64.9	66.1	67.3
Consumed	mln t	59.0	59.2	60.1	60.0	62.5	65.2	67.9	70.8
Market balance	mln t	-0.8	4.2	4.3	5.9	5.3	-0.3	-1.8	-3.5
Copper	USD/t	4,871	6,194	6,500	5,442	4,567	5,766	6,688	6,779
Produced	mln t	23.3	23.5	24.0	24.4	25.1	24.4	25.5	26.4
Consumed	mln t	23.4	23.7	24.0	24.3	25.1	25.9	26.7	27.6
Market balance	mln t	-0.1	-0.2	0.0	0.1	0.1	-1.4	-1.2	-1.1
Zinc	USD/t	2,101	2,890	2,922	2,265	1,619	2,065	2,234	2,303
Produced	mln t	13.6	13.3	13.3	14.0	14.3	14.0	14.2	14.5
Consumed	mln t	13.9	13.7	13.7	13.3	13.8	14.2	14.6	15.1
Market balance	mln t	-0.3	-0.4	-0.4	0.7	0.6	-0.2	-0.4	-0.6
Nickel	USD/t	9,595	10,410	13,114	11,038	9,154	10,732	13,575	13,497
Produced	mln t	2.0	2.1	2.2	2.4	2.5	2.3	2.4	2.6
Consumed	mln t	2.0	2.2	2.1	2.1	2.1	2.2	2.3	2.4
Market balance	mln t	0.0	-0.1	0.1	0.3	0.4	0.1	0.1	0.2

Source: Australian Department of Industry, Innovation and Science, Bloomberg, IMF, ACRA forecast

According to ACRA estimates, in case of a negative global economic scenario, metal prices could see their biggest fall in 2020.

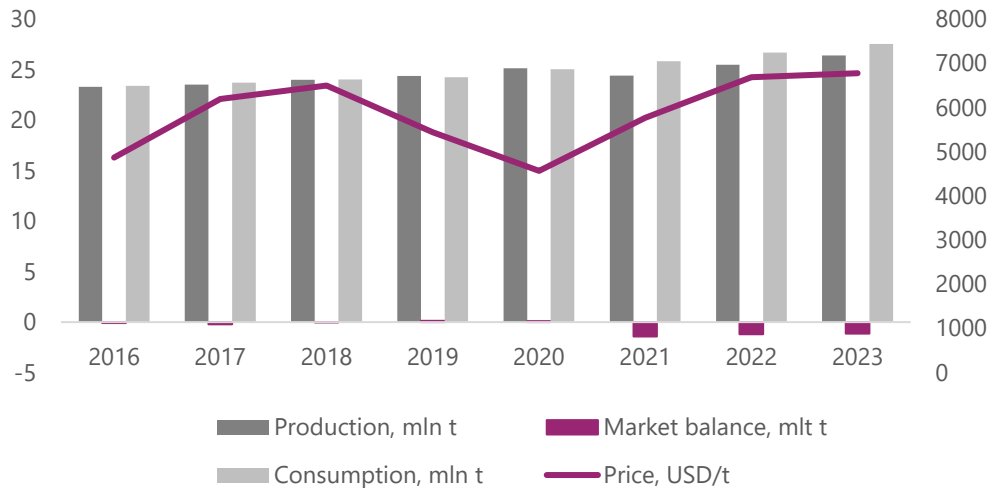
In case of a market crisis, ACRA expects that aluminum prices will be around USD 1,445 per metric ton in 2020 (-31.46% compared to the average price in 2018), copper — USD 4,567 per metric ton (-29.73% compared to the average price in 2018), zinc — USD 1,620 per metric ton (-44.59% compared to the average price in 2018), and nickel — USD 9,150 per metric ton (-30.2% compared to the average price in 2018).

Figure 8. Primary aluminum: global market balance



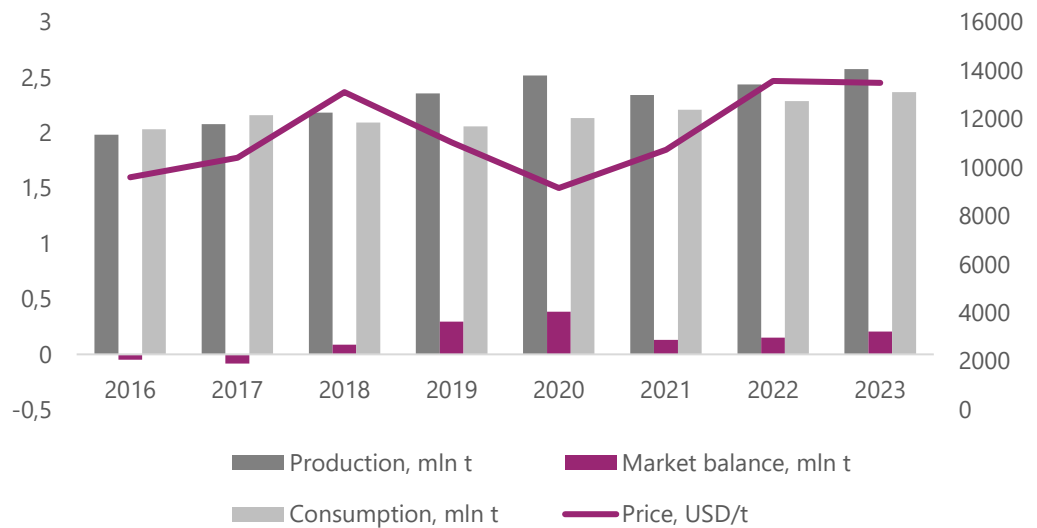
Source: Australian Department of Industry, Innovation and Science, Bloomberg, IMF, ACRA forecast

Figure 9. Copper: global market balance



Source: Australian Department of Industry, Innovation and Science, Bloomberg, IMF, ACRA forecast

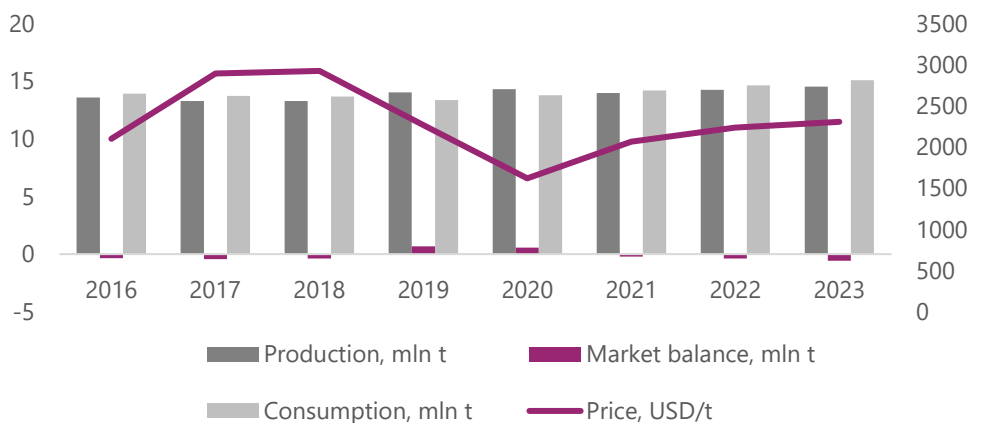
Figure 10. Nickel: global market balance



Source: Australian Department of Industry, Innovation and Science, Bloomberg, IMF, ACRA forecast

According to ACRA estimates, the current zinc price is largely speculative and therefore, in a shock scenario, zinc prices would drop much deeper than prices for other metals due to falling interest from speculators. The Agency expects zinc prices to settle around USD 2,300 per metric ton in the post-crisis period (by 2023).

Figure 11. Zinc: global market balance



Source: Australian Department of Industry, Innovation and Science, Bloomberg, IMF, ACRA forecast

Calculations and data sources

This forecast was drawn up using the scenario-based model developed by ACRA for the non-ferrous metals market. The model includes both the fundamental factors impacting the market supply/demand balance and developments and other factors reflecting the subjective opinion of ACRA.

In ACRA's opinion, pricing in the non-ferrous metals market is driven not only by the supply/demand balance and the volatility of metal stocks at major world commodity exchanges, but also by the rate of US dollar as well, which determines the speculative demand for commodities. The consumption amounts were projected on the basis of the growth in the world economy expected by ACRA, while production volumes were estimated using the data from the Australian Department of Industry, Innovation and Science.

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