CHAPTER 2

Basics of the Global Aluminium Market

Aluminium is a chemical element in the boron group, with the symbol Al and atomic number 13. In its pure form, aluminium is a silvery-white, soft, nonmagnetic and ductile metal. It is the third most abundant element in the Earth's crust—exceeded only by oxygen and silicon. That makes aluminium the most abundant of all known *metals,* comprising about 8% of the Earth's crust by mass. Due to its chemical characteristics, aluminium is rarely found in its pure state but is abundant in combination with other elements in more than 270 different minerals. The most important ore for aluminium is bauxite, but aluminium is also extracted from other ores, such as nepheline, which is important for production of alumina in Russia.

Its physical and chemical characteristics—such as light weight, corrosion resistance, electrical conductivity (Holloway 1988, p. 10)—are what makes aluminium important economically and in market and technological terms. Also the fact that aluminium is easily recyclable has made it the metal of choice for many industries and has created incentives for building national systems for its collection and reuse (Das et al. 2010; International Aluminium Institute 2009; Schlesinger 2013). These characteristics led *Life* magazine to describe aluminium as the metal of the twentieth century; and as one book on this dream metal argues (Sheller 2014), it has indeed changed the lives of millions of people.

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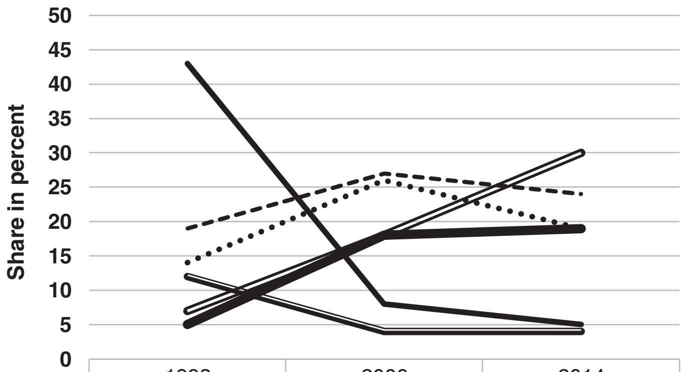
How Is Aluminium Used?

According to the USGS study on the global flows of aluminium, its end uses were distributed as follows, as of 2006 (Menzie et al. 2010):

- buildings (32%)
- engineering and cable (28%)
- packaging (1%)
- transportation (28%), including automobiles (16%)
- other (11%)

A more detailed and updated overview of how aluminium is used and what may be expected in the future can be found in the highly detailed study based on an impressive set of data published recently by the International Aluminium Institute in London (International Aluminium Institute 2016a). The USGS study showed also that there are major differences in how much aluminium is used at national levels and in what ways: for instance, the use of aluminium per capita in Russia (7.3 kg/cap) was four times lower than in the USA (30.7 kg/cap) or Germany (31.78 kg/cap), almost the same level as in China (6.63 kg/cap) but more than seven times higher than in India (0.97 kg/cap) (Menzie et al. 2010, p. 37). Concerning end use in Russia, the same report quoted a Russian study from 2003 showing that 7% of aluminium consumption concerned the construction sector, 19% the transport sector, 18% the power generation sector (electricity), 10% went to production of durable goods, 3% to packaging, and 40% for machinery and equipment (Menzie et al. 2010, p. 38). In an October 2015 presentation on the aluminium market, the head of UC Rusal Russia and CIS division Roman Andryushin quoted historical data on how the use of aluminium changed in Russia between 1993 and 2014 (Andryushin 2015) (see Fig. 2.1).

However, before aluminium products can reach their final market destinations they must go through the production process. The following sections give a brief orientation on the steps necessary before products can be shipped to the markets; who are the main producers today and how the market has evolved; and finally, some words on the changing role of Russia in the global context and on the role of aluminium in Russian trade.



	1993	2006	2014
Construction	5	18	19
Machinery and equipment	43	8	5
Power generation (electricity)	14	26	19
Packaging	7	18	30
Transport	19	27	24
Others	12	4	4

Fig. 2.1 Changes in the use of aluminium in Russia 1993–2014. *Source* Andryushin, R. (2015). 'Situatsiya na rynke aluminya 2015. Alyuminevaya dolina', (Moscow: UC Rusal), p. 6

Raw Materials and Processes

Bauxite was discovered by the French geologist Pierre Barthier in 1821 in southern France, near the village Les Baux-de-Provence—from which the mineral took its name. However, industrial production of aluminium could begin only after the technology for extracting alumina from bauxite ore—the Bayer process—had been elaborated in 1888 by Karl Josef Bauer, and the technology for producing aluminium from alumina devised by the US chemist Charles Martin Hall assisted by his sister Julia in 1886, and almost simultaneously by the Frenchman Paul Héroult in 1888.

Initially, bauxite production was concentrated in France and in the USA, but technological developments and the growing market resulted in exponential growth in bauxite, alumina and aluminium production and trade. Between 1890 and 2012, global production of bauxite increased from 22,000 tonnes to 211 million tonnes; the growth in alumina and aluminium production was almost the same (Ingulstad et al. 2014, p. 2). Approximately 85% of bauxite produced is used as input for the production of alumina; and all alumina ends up as input for the production of primary aluminium. Producing one tonne of primary aluminium requires two tonnes of alumina, which in turn requires that between four and five tonnes of bauxite be extracted. The process of alumina and aluminium production is extremely energy-intensive—in 2012, production of non-ferrous metals, mostly aluminium, accounted for 2% of all delivered industrial energy consumption in both the OECD and non-OECD regions, and was expected to remain at a similar level also in the future (US Energy Information Agency 2016, p. 118). All these factors have had impact on the national and global markets for bauxite, alumina and aluminium.

In the introduction to their edited volume on the global bauxite industry, Ingulstad, Storli and Gendron (2014, pp. 3–4, 5–6) present a concise description of the production process and global aluminium value chain that can serve as a good point of departure for the present study of the role of Russian aluminium producers in the global context. The process of production of aluminium from bauxite is described as 'one of the longest and most complex refining processes for any known metal'(Ingulstad et al. 2014, p. 3). This process involves several steps, including heating and cooling of bauxite in caustic soda under pressure, removal of impurities, and washing and calcination during production of the alumina that then goes into the production of primary aluminium through the highly energy-intensive Hall–Hérault process.

The need to transport huge volumes of bauxite from extraction sites to alumina production sites creates an incentive to localize alumina production facilities close to areas of bauxite extraction. The massive need for energy—production of 1 tonne of primary aluminium is estimated to require some 15,000 kWh of electrical energy—provides a major incentive to locate aluminium production facilities in areas with easy access to cheap and reliable energy, preferably not too distant from the final markets. Ideally, production of primary aluminium should take place in the same area where bauxite ores are extracted and processed into alumina, where there should also be access to inexpensive—preferably sustainable—energy, and facilities located not far away from where primary aluminium is reprocessed into more value-added products, which in turn should be shipped to final markets located not far from the production sites. Shorter physical distances between various elements of the global aluminium value chain could lower the transport costs and make the whole system more flexible for responding to changing market conditions (Fig. 2.2).

However, due to the interaction of various geological, political, economic and market factors, many primary aluminium production facilities are located in peripheral areas, far away from where bauxite is extracted and alumina is produced. Also the distance to final markets drives the costs of operations up. The need to have access to abundant, cheap and reliable sources of energy—preferably electricity—drives the cost of operations down and up. Down, because energy costs represent between 20 and 40% of total aluminium production costs; up, because of high transport costs from alumina production sites to aluminium production sites, and from aluminium production sites to final markets.

These problems, in addition to security concerns driven by Soviet strategic calculations, have played a major part in shaping the Soviet and Russian aluminium industry. A further recurrent challenge has been the

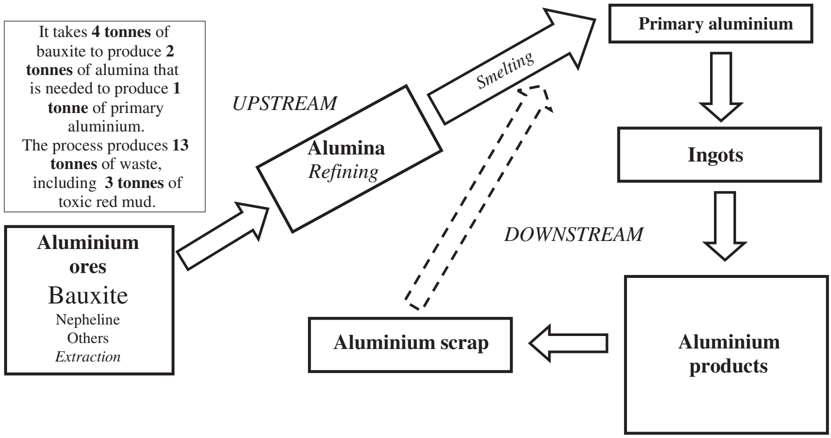


Fig. 2.2 Aluminium value chain (simplified). Based on Menzie, W.D., Barry, J., Bleiwas, D.I., Bray, E.L., Goonan, T.G., and Matos, G. (2010), Ingulstad, M., Storli, E., and Gendron, R.S. (2014) and http://www.hydro.com/en/About-aluminium/Aluminium-life-cycle/

fact that neither the Soviet Union nor Russia has managed to develop its own resource base for production of aluminium, so a relatively high share of the aluminium produced in Russia—and historically in the Soviet Union—has depended on import of bauxites and alumina from abroad. Factors shaping the industry in Russia and the evolution of the Russian aluminium industry are discussed in Chaps. 3, 4 and 5 of this book—here in this chapter, the focus is on the global level and the role of Russian aluminium in the global context.

Global Geography—Where Does Russia Fit in?

In order to understand how the aluminium market works, we also need to examine how the markets for bauxite and alumina have evolved. Several studies—(Bertilorenzi 2014, 2016; Bertilorenzi and Barjot 2015; Bertilorenzi and Mioche 2013; Gendron et al. 2014; Holloway 1988)—have already shed light on these aspects of the market; there is no point in simply reiterating their findings here. Instead, I focus on the place of the Soviet Union/Russia in this international landscape by examining some data on the evolution of that market. Readers wishing to know more about the longer historical lines can consult an excellent recent work that presents the evolution of the Soviet production and participation in global trade (Bertilorenzi 2016 see pages 209, 215, 240 and 256 for a statistical overview of evolution of the Soviet production). My focus is on the post-Soviet period, and here I have found the work of Carmine Nappi, mapping the evolution of the global market between 1972 and 2012 (Nappi 2013), very useful (Table 2.1).

In this period, the production and market shares of bauxite and alumina decreased, with bauxite production going from ca 7 million tonnes in 1972 to ca 6.45 million tonnes in 2010, and alumina production from 2.9 million tonnes to 2.7 million tonnes. Shares fell from 10% in 1972 to 3% in 2010 in bauxite production and from 12 to 3% in alumina production. Although the share in primary aluminium production also dropped, from 16% in 1972 to 9% in 2010, production volumes almost doubled—from 1.9 million tonnes in 1972 to 3.7 million tonnes in 2010.

Russia managed this market transformation relatively well. However, it was not able to solve the structural problem of dependence on supplies of bauxite and alumina from abroad that were needed to feed the increasesd volumes of aluminium production.

Table 2.1 USSR and Russia: shares in global production of bauxite, alumina and aluminium 1972–2010

	1972	*2010*		*1972*	*2010*		*1972*	*2010*
Bauxite (in million t)	71	215.2	Alumina (in million t)	24.1	88.6	Aluminium (in million t)	11.7	41.1
Country (share)			Country (share)			Country (share)		
Australia	20	32	USA	25	4	USA	32	4
Jamaica	18	4	Australia	13	23	USSR/Russia	**16**	**9**
Suriname	11		USSR/Russia	**12**	**3**	Japan	9	
USSR/Russia	**10**	**3**	Jamaica	9	2	Canada	8	7
France	5		Japan	7		Norway	5	3
Guyana	5		Suriname	6		China		39
Guinea	4	8	China		35	Australia		5
Brazil		15	Brazil		11	Brazil		4
China		14	India		4	India		4
India		6	Ireland		2	Middle-East		6
Indonesia		11						

Source Nappi, C. (2013). *The Global Aluminium Industry. 40 years from 1972*; London: International Aluminium Institute

Two developments in that period changed Russia's position on the market. The first was the collapse of domestic demand for Russian aluminium, due mainly to the general economic turmoil in the wake of the collapse of the Soviet political project and the de-militarization of the Russian economy, forcing Russian producers to redirect to the global market. The second change was the transformation of the ownership structure in the industry following the political decision on the transfer of state-owned economic assets to private owners.

These processes are described in detail in the following chapters. Here let me just point out that the process of consolidation of aluminium assets led to the creation of an aluminium duopoly in Russia, and then in 2007 the first privately-owned natural monopoly in the country, controlling all aluminium production, most of which was exported. This new actor had to learn how to operate in the global aluminium landscape that was becoming far less predictable, with many actors fighting for shares in this rapidly growing market. In the 1970s, the market had been dominated by six big international aluminium companies—Alcoa, Alcan, Reynolds, Kaiser, Pechiney, and Alusuisse—which by 1979 controlled 54.4% of bauxite, 73.8% of alumina and 62.2% of aluminium production.

Now the corporate map of the sector had undergone huge changes, and by 2010 new actors were emerging—among them UC Rusal—who gained control over relatively high market shares. Especially, two groups of new actors contributed to structural change in the market: Chinese companies and aluminium producers from the Gulf area. Whereas Chinese companies produce aluminium mainly to supply the domestic market, facilities in the Gulf area—together with other suppliers—have become important exporters of aluminium to the global market.

Russian aluminium producers facing the grim post-Soviet reality entered a global aluminium market that was growing almost exponentially. Global aluminium production had crossed the symbolic one million tonnes line in 1941, when the industry had to provide military hardware to parties already at war or preparing for entry (Bertilorenzi 2016, p. 229). In particular, the huge numbers of aircraft that had to be produced drove demand for aluminium during the war—USSR alone produced no less than 158,218 aircraft from 1939 to 1945, and each one needed aluminium inputs (Bertilorenzi 2016, p. 240). The two million tonnes global aluminium production line was crossed in 1952. 20 years later, it reached 11.7 million tonnes (Bertilorenzi 2016, p. 256); in 2010, 42.3 million tonnes—and in 2015, 57.9 million tonnes of aluminium were supplied to customers worldwide (International Aluminium Institute 2016b).

When Russia emerged as a new state after the collapse of the Soviet Union, the country had to redefine itself as an international actor. Also, various kinds of economic actors operating in Russia had to adapt to these new political and economic realities. Faced with the growing unpredictability and falling demand for their products on the domestic market, where the main customers were companies in the country's powerful military industrial complex, Russia's aluminium producers had to find a quick, workable solution. And thus they set about drastically increasing Russian participation in the global aluminium trade.

As noted by Gaddy in his study on the adaptation of Russian militarized economy to the post-Soviet challenges, the new situation led Russian aluminium producers to see new opportunities (Gaddy 1996, pp. 100–101). Although figures differ—Gaddy quotes the level of export of aluminium from Russia as ca 250,000 tons before the export boom in 1990 and 1.8 million tons in 1993(ibid: 100), whereas two Swedish experts (Leijonhielm and Larsson 2004, p. 72) quote slightly higher figures (876,000 tons in 1990 and 2.178 million tons in 1993)—in the course a few years (1990–1993) Russia emerged as a key player on the global aluminium market.

This came at a very special moment, when aluminium prices were very low—USD 1254 per tonne in 1992 and USD 1139 per tonne in 1993 (Leijonhielm and Larsson, 2004, p. 81)—and market had to cope with oversupply. However, the dramatic fall in domestic demand left Russian producers with no alternative: for them it was a question of either exporting and surviving, or shutting down the factories and disappearing—like many other branches of the economy that could not cope with global competition and political, social and economic turmoil in Russia. The arrival of huge volumes of Russian aluminium on the already strained global market caused huge tensions and resulted in accusations of dumping and unfair market behaviour. Those accusations notwithstanding, Russia established itself as key global aluminium player; and ever since then, a very high share of the country's aluminium production have gone to the global market. According to most detailed available data for this early period of Russian market expansion, between 1990 and 1996, the share of export in Russian aluminium production increased from slightly above 30% to more than 80%, and the volume grew from 876,000 tons to 2.3 million tons (Leijonhielm and Larsson 2004, p. 72).

Russian aluminium producers—like all other producers in a market economy—produce aluminium not for the sake of producing aluminium or supplying the domestic and global market, but in order to generate revenues to the company owners, be they private shareholders, or the state. Details on the level of revenues generated by export of Russian aluminium in the early years of post-Soviet Russia are sparse, but combining data on the volume of Russian aluminium export 1990–1996 with data on average prices paid for aluminium on the London Market Exchange can indicate how much Russian actors earned in this early period. However, it is widely believed that the Russian international aluminium trade was in that period most profitable not to Russian aluminium producers, but to a relatively small group of metal traders operating in Russia and controlling the money flows through the 'tolling schemes' that were abolished in two rounds: one in 1999, and then in 2004, when the new tax code removed tolling privileges by imposing additional taxes on such operations. Further details on this specific feature of the early period are discussed in Chaps. 3, 4 and 5; here let me simply give the reader a general idea of the economic dimension of this activity.

A rough assessment of the value of Russian aluminium exports between 1992 and 1996 can be made by combining data on the volumes of Russian export of aluminium with data on the average annual price for aluminium on the London Metal Exchange (Data on volume and prices from from Leijonhielm and Larsson 2004, p. 81). This approach yields the following possible revenues generated by export of Russian aluminium in this formative period: USD 1.5 billion in 1992, USD 2.48 billion in 1993, USD 3.44 billion in 1994, USD 4 billion in 1995 and USD 3.45 billion in 1996—altogether nearly USD 15 billion during those 5 years.

Data prior to 2000 are not easily available or reliable, but from 2001 onwards there is the UN Comtrade database that can be used for mapping Russia's aluminium relationships (UN Comtrade 2016). Instead of analysing data for each year in this period, I use data for Russian exports of aluminium and articles (commodity code 76) to map the long-term economic importance of key Russian aluminium partners.

In the period between 2001 and 2015, Russian exports of this commodity generated no less than USD 94.2 billion in revenues. After the 2007 consolidation of the Russian aluminium industry, these trade and money flows were controlled by UC Rusal. Three countries 'contributed' in that period with more than USD 10 billion: the USA (USD 20.7 billion), Japan (USD 17.2 billion) and the Netherlands (13.6 billion). They were followed by a group of countries that imported aluminium from Russia worth between USD 10 and 1 billion: Turkey (9.6), Germany (3.6), Portugal (3.5), South Korea (3.4), Switzerland (2.4), Norway (2.1), Greece (1.7), the UK (1.6), Italy (1.4), Poland (1.3) and Ukraine (1.2). It was only after Ukraine (number 14 on this list) that China emerges, having imported aluminium from Russia worth ca USD 0.88 billion. In other words, China did not become a key market for Russian aluminium, mainly because the country managed to develop its own industry, which today stands for more than 50% of global production of aluminium.

Given the geographical proximity of the rapidly growing Chinese market to major Russian production facilities in Eastern Siberia, Russian producers viewed China as a sort of promised land for aluminium. In recent decades, however, not only has China become self-sufficient, but, together with the global crisis of 2008–2009, supplies of aluminium from China sold on the global market have contributed to its destabilization (Fig. 2.3).

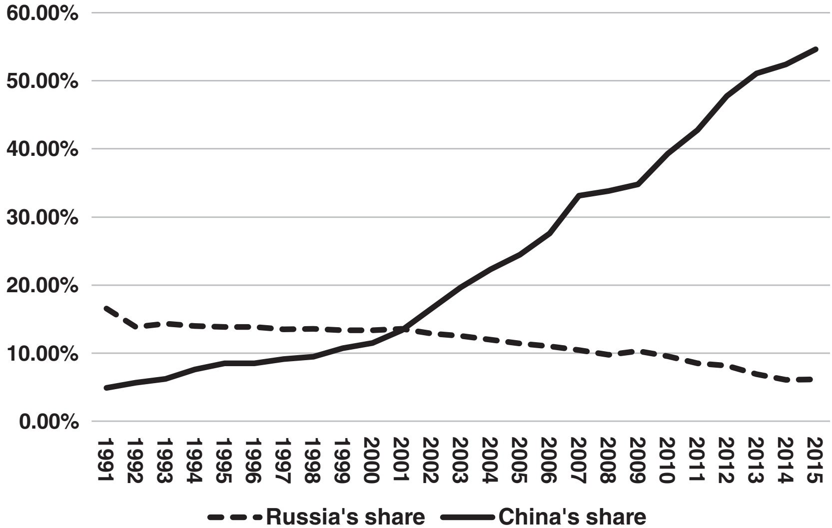


Fig. 2.3 Russia and China: shares in global aluminium production. *Source* U.S. Geological Survey (2016). 'Aluminum. Statistics and Information' (updated 25 October 2016)

On the other hand, Russian producers still have at least one competitive advantage: their production is based mostly on the use of renewable hydropower supplied by giant hydropower plants in Eastern Siberia, whereas China's energy mix—and thus its aluminium production—is dominated by polluting coal. The Chinese market is still viewed as highly attractive, due to the expected high growth in demand for aluminium as well as China's growing focus on pollution and climate change. According to some estimates, China was set to increase its import of aluminium from 3 to 4 million tons in 2015, and UC Rusal was 'well positioned to benefit from the growing demand' and wanted to increase the share of the Southeast Asian market in its export to 30%.[1] However, the success of this strategy hinged on UC Rusal having access to inexpensive energy. In 2011, the situation was advantageous for Russian aluminium producers because they paid less for energy than the Chinese producers: the cost of electricity varied between USD 20 to USD 30 per MWh in Russia, as against almost twice as much—USD 70 per MWh—in China.[2]

Recent Market Developments, Outlook for the Future

Aluminium does not differ much from other global commodities in market terms. The central factor to be taken into account by those who make strategic decisions on production and trade in this commodity is the price of aluminium they can expect to get in the market. According to a detailed study on commodities published by the World Bank in 2009 (The World Bank 2009), the most characteristic feature of price formation in the market for commodities is its cyclical behaviour, caused by the fact that 'supply decisions (how much to plant, how many mine shafts to dig) must be made by market participants well before the final sale price of the commodity is known' (Ibid., p. 54). The same study notes that industrial commodities—including aluminium—generally face a more volatile price environment because demand is influenced not only by supply decisions and demand, but also by business cycles and policy-related supply (and demand?) shocks. Commodity prices are also sensitive to spare capacity, but there are differences between various types of commodities here. With aluminium—and other metals—periods of booms and busts tend to be longer, because of the lags between decisions on investment in new capacities and increase in supply.

Actors operating on the aluminium market must also be prepared to operate in a more volatile environment as to what they can expect in revenues, because they are more exposed to demand shocks. According to a 2014 study on commodities markets (Deutsche Bank 2014), the global outlook for aluminium is characterized by three distinct phases in the evolution of prices for an oversupplied commodity. Phase I involves a rapid price decline as the market moves into significant over-supply. In Phase II, the characteristic feature is a slow price decay, possibly followed by a period of price stabilization, as production growth slows or producers implement supply cuts. In Phase III, price appreciation is to be expected, as supply curtailments reach a critical mass, and the market either anticipates or again moves into deficit. These trends can be observed throughout the history of the aluminium industry. The situation of recent years can serve as a solemn reminder of how the market develops and how difficult it is to predict when each of these three phases will begin and end, or how various actors will adapt to the changing market conditions. In the course of the past decade, the aluminium market experienced a huge commodity boom that lasted from 2002 until the second half of 2008. Then came a market bust that for the first time in recent history resulted in lower production of aluminium in 2009 than in the year previous. Indeed, 2009 was a tough year for aluminium producers, who were hit hard by the fall in demand and in prices. The 2009 recession resulted in an 8.2% drop in demand for aluminium, and the average price for aluminium dropped by 35%. Aluminium producers responded by cutting annual production by approximately 2.4 million tonnes, to take this volume from the falling market. Global aluminium production decreased by 5.9% as compared to 2008, ending at 37.8 million tonnes in 2009. However, the International Aluminium Institute has assessed the drop in production as even greater—minus 6.18%, from 38.8 million tonnes in 2008 to 36.4 million tonnes in 2009 (International Aluminium Institute 2016b).

According to the latter source, production of primary aluminium declined all over the globe, with the exception of Asia (Area 4/5), where it actually increased by 12.18%, from 3.92 million tonnes in 2008 to 4.4 million tonnes in 2009. Production of primary aluminium in four other regions was affected only moderately, falling by 1.08% in China, 1.98% in Africa, 3.74% in Oceania (mainly Australia) and 5.71% in Latin America. Three production areas were hit more severely: East and Central Europe (including Russia) saw a decline of 11.61%, North America 17.7% and Western Europe 19.4% in primary aluminium production compared with 2008. Alcoa's primary aluminium production was 11% lower in 2009 than in 2008 (3.564 in 2009 and 4.007 in 2008),[3] RioTinto Alcan reduced its production only by 4% (from 3.981 to 3.803 million tonnes),[4] whereas Hydro suffered heavy losses, with primary aluminium production falling by more than 20%, from 1.750 to 1.396 million tonnes.

The turmoil in the aluminium market was caused partly by a new phase in the world economic crisis, especially in Europe and the USA, but also other factors were involved. Especially important here is the *cyclical nature* of commodity markets, including the aluminium market, as seen in Fig. 2.4.

In its 2014 outlook analysis, Deutsche Bank indicated that industry profitability improved between 2010 and 2014 due to a combination of higher prices and lower costs, and opined that the current all-in price of ca USD 2500 per tonne would make most of the aluminium industry cash positive—that is, cash inflows will exceed cash outflows. Further, according to the Deutsch Bank analysis, average industry costs

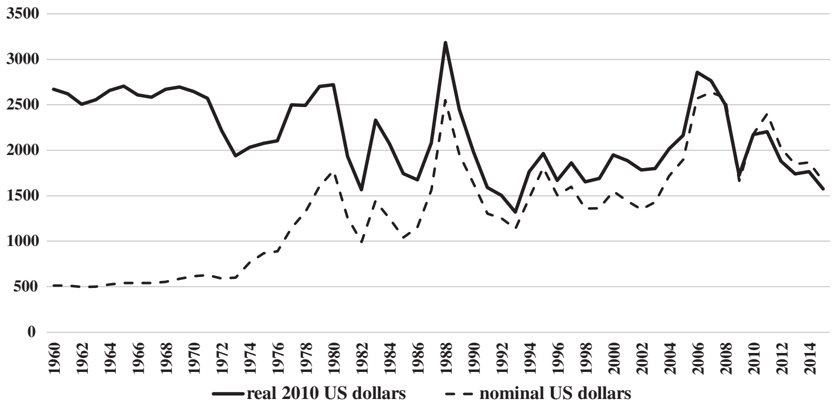


Fig. 2.4 Price of aluminium 1960–2015. *Source* http://pubdocs.worldbank.org/en/500671478119762068/CMO-Historical-Data-Annual.xlsx

had declined due to weaker producer currencies, price-linked input-cost reductions and general efficiency-improvement measures.

According to the January 2015 World Bank assessment of trends on global commodities markets, the situation on the global aluminium market was expected to improve slightly in future (World Bank 2015a). However, the price fall observed throughout 2015 could pose new challenges. The World Bank study estimated that metal prices in general would decline by more than 5% in 2015, whereas aluminium prices were expected to rise by 3% —but that has not been the case. The report noted also that aluminium inventories, rising since end-2008, decreased by 22% towards the end of 2014—an important factor influencing the market. Further, the main risk was held to be a sharp slowdown in the Chinese economy.

In fact, the situation in 2015, with falling aluminium prices, gave rise to concern. Aluminium prices fell 9% in the first quarter (Q1) of 2015, and this negative trend continued in Q2 (World Bank 2015b, p. 26) and Q3 as well (World Bank 2015c, p. 23). Main reasons given were weaker demand as well as higher exports from China, which created a global surplus despite curtailment efforts undertaken by other actors (World Bank 2015d, p. 21).

The World Bank's first commodity report in 2016 showed clearly that the market for aluminium would remain volatile. The report noted a 6% price fall, and the situation was not helped by the fact that LME inventories were declining. That served instead to slow demand and continued growth in smelting capacity in China, in turn influencing market behaviour. Although demand for aluminium remained robust because the metal is used for many different purposes and in various sectors of the economy, the price of aluminium continued to fall. Some key actors, like Alcoa, announced capacity cuts, but they were limited to only 1% of the market and had little effect on price. Here again, Chinese producers were blamed for flooding the market with semi-manufactured products that could not be put on the domestic market, where demand was weaker than expected (World Bank 2016, p. 29).

According to this 2016 World Bank study, the situation in 2016 would remain volatile. Falling LME inventories, stronger demand and production cuts in China would push prices up by 3%. However, the study concluded that the global market would remain oversupplied, as new capacity was expected to come on line in China and elsewhere. Metal prices were projected to decline by 9% in 2016 due to surplus capacity in most markets. However, the price of aluminium was expected to remain relatively stable, especially compared with nickel and copper, expected to fall by 22 and 15%, respectively.

This fairly negative market outlook has also had consequences for Russian aluminium producers. In 2016, they faced not only turmoil on the global market, but also negative developments in Russia where the new round of the economic crisis affected the expected growth in demand for aluminium on the domestic Russian market where they hoped to be able to sell a higher share of their production. The lower pace of state-driven investments in Russia and the cuts in the defence budget announced recently may spell problems for Russian aluminium producers. However, there is also a certain hope that they will be able to adapt to this new aluminium reality in the same way as they have adapted to changing political and economic realities in the post-Soviet period of development of this branch of the Russian economy. Chapters 3 and 4 tell the story of adaptation of this industry to changing market conditions. Chapter 6 paints a more detailed picture of how this adaptation took place in Russian regions where Russian aluminium assets are located whereas Chaps. 7, 8 and 9 examine how Russian aluminium actors adapted to fundamental changes in the Russian political framework.

Notes

1. http://russia-briefing.com/news/china-to-become-key-driver-of-russias-aluminium-industry.html/.
2. Ibid.
3. http://www.alcoa.com/global/en/news/news_detail.asp?pageID=20100111006969en&detailType=invest&newsYear=2010.
4. www.riotinto.com/documents/PR788g_Rio_Tinto_announces_underlying_earnings_of_6.3_billion.pdf.

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