

Russia's Accession into WTO:
A Case Study of the Aluminium Industry¹

Oleg Ustenko²

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This paper is a part of CEFIR's study on Russia's accession to the World Trade Organization (WTO). We have based this study on the Russian aluminium industry and particularly on *Russian Aluminium (RusAl* - the largest firm in the domestic aluminum market and number two on the world market), and *Siberian-Urals Aluminium Company (SUAL)* (number two in the domestic market).

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² Centre for Economic and Financial Research (CEFIR), Moscow *Comments are welcome to* oustenko@cefir.ru

Executive Summary

This paper examines possible scenarios for Russian industrial producers after the country's accession to the World Trade Organization. The paper is based on a case-study that was done on the aluminum industry. The main conclusion of the study is that, as a result of WTO accession, both Russian producers of aluminium and Russian producers of goods made from aluminum will gain certain advantages and disadvantage. Producers of primary products will acquire the most benefit. At the same time, producers specializing in secondary products (with a high added value) may lose in the short run.

Taking into consideration that over the last few years there have been no significant changes in the level of competitiveness of high-added-value products, this paper concludes that there is no need to protect local producers. Moreover, as a result of increasing the level of competition in the local market, positive changes in the competitiveness of the local producers over the medium and long term can be expected.

Trade liberalization in the aluminum market will carry social consequences. An increase in the number of employees in primary aluminium production is expected. At the same time, there will be a decrease in the number of employees in secondary aluminum production. The situation will thus demand from the government an active labor market policy.

Introduction

Russia's accession into the WTO is a subject of numerous discussions and debates in the country and abroad. The main topic concerns the new system of the tariff regulation and the way it affects local producers. Debates also cover labor policy issues, institutional reforms, competition policy, foreign direct investments (FDIs) and others. At the same time, some of the discussed questions are not based on appropriate analysis. Moreover, they don't reflect the reality of the current situation of the Russian economy. It is very common that Russian business people from the same sector have opposite views concerning the country's accession into WTO. Their positions depend on: what products they produce; in which region they are;³ how good and how close their relationship with the local government officials are (governors or the mayor); how competitive their enterprise is, and how their enterprise is related or connected to firms from other industries. Russian producers are trying to protect their industries. The main argument to get this additional protection from the government is an *argument of learning by doing*. The proposed form of protection is through the system of import tariffs. At the same time, *infant industry arguments* are not always applicable.

The main idea of this study was to take an inside look on Russia's accession into WTO from the point of view of one particular industry. As a result of our study we expected to

- identify interests of different groups in the process of WTO accession;
- test whether business people from the industry support the decision, which was made by the Russian government;
- check whether the Russian aluminium industry deserves an infant industry status.

The methodology of the study was based on conducting a series of interviews with business people from the industry. We interviewed middle level managers from the two major domestic players on this market: *Russian Aluminium (RusAl)* and *Siberian-Urals Aluminium Company (SUAL)*. They control almost 95% of the Russian aluminium market and about 20% of the world aluminum market. We also interviewed managers from *Alcan*, a Canadian firm, which is ranked number three on the world market after *Alcoa* (USA) and *RusAl*. Therefore, our interviews involved employees from enterprises

³ See also Frye, Zhuravskaya. Rackets, Regulation and the Rule of Law

controlling 95% of the local Russian aluminum market and about 30% of the world market.

In the *first part* of this paper we identify different criteria concerning the economic effects of WTO accession. In the second *part* we discuss the perspectives of Russia's aluminium industry as a part of the global aluminium market. The *third part* provides the background of *Russian Aluminium and SUAL-Holding*. This includes the firms' profiles, structures, and the competitiveness of their products. The *fourth part* gives the conclusions and policy recommendations derived from this study.

1. Economic Analysis for Russia's Accession into WTO was almost completely absent in the first stage of public discussions in the country. This situation has changed and, consequently, there have appeared several studies on this issue.

The main criteria for estimating the economic effect of accession are considered as follows:

- *additional opportunities for the country's economic growth* as a result of the WTO's membership;
- *stimulation of the general reform process* in the country, and specifically institutional reforms;
- *increase of the domestic producers' competitiveness* on different markets;
- *import of new technologies* (including managerial).

The most publicly discussed issues are the most sensitive. They are related to:

- *labor market and possible increase in the level of unemployment after accession*;
- *whether Russian producers can remain competitive* after the reduction in tariff rates (especially in products with a high added value);
- *needed level of protection in agriculture* and its future under the new trade regime.

Possible solutions to of the discussed problems, which are lobbying by different industries and sectors, disperse from the *infant industry status* arguments to supporting domestic producers through the mechanism of *export subsidies*. Producers of high added value products (i.e., automobile building, services and others) spend huge efforts in this struggle.⁴

2. Russian Aluminium Industry and WTO accession

Russian Aluminium Industry's Background

In the early 1990s, when the Russian economy was liberalized, and after the collapse of the Soviet central planning system, independent Russian producers of aluminum significantly increased their share on the world market. This was done as a result of:

- a decrease in domestic consumption due to the economic crises in the country;
- a higher price level for aluminium on the world market than on domestic in 1991-1992.

Since 1992 Russian exports to the world markets had progressed and by the end of 2000 reached about 3.4 million tons (see *Figure 1*).⁵

Figure 1. Russia's production and trade in aluminium

⁴ It is very usual for developing and transition countries who are trying to liberalize their trade. For more details see Rodrik. *Credibility of Trade Reform: a policymakers guide*

⁵ Aluminium Industry Review on <http://www.aluminum.org/>

By the beginning of 2000 Russian companies controlled more than 15% of the world market and many of them started reorganization, mergers and restructuring programs. This trend is also typical for companies in the West (i.e. recent merger of *Alcoa and Reynolds*).

The Russian aluminium industry is one of the most competitive in the world market. It plays a significant role in the country's economy. During the last decade, the share of the aluminium industry in the total Russian industrial production was about 3% in current prices.⁶

Aluminium production is a high electricity consuming process. The electricity cost is almost 1/3 in all costs for aluminium production. The main comparative advantage of Russian producers of aluminium is relatively low cost of electricity in the country. The most powerful world producers of aluminium (USA and Canada) have electricity tariff rates almost three times higher than in Russia. *See Table 1* for details.

Table 1.

*Tariffs for electricity*⁷

(Year 2000)

| Country | Tariff, cents per 1 kilowatt/hour | Difference from Russian rate, % |
|---------|-----------------------------------|---------------------------------|
| Russia | 1.36 | 0 |
| USA | 3.9 | 286 |
| Canada | 3.8 | 279 |
| UK | 6.4 | 470 |
| Germany | 5.7 | 419 |
| Japan | 14.3 | 1051 |

The specific characteristic of the Russian aluminium industry is its export orientation. Almost 80% of the industry's production of primary aluminium is exported. At the same

⁶ See Annual Statistical Report of *Goskomstat* 2000.

⁷ See Yakov Urinson *Tariff Policy and Cost Minimization* / Also available at <http://www.rao-ees.ru/ru/news/execspeech/show.cgi?urinson111201.htm>

time, during the last decade this number decreased from 87% in 1991 to present 80%.⁸
See attachment 1.

The composition of the domestic aluminium consumption (*attachment 2*) shows that 20.5% of it was imported. In those products, where added value is higher, the imported component is significantly higher. For example, in foil and box materials this share is twice as high (41.8%) than the average level for aluminium import.

The industry is highly dependent on other industrial enterprises. The largest domestic industrial consumers of aluminium are foil producers (51.1% of the total industrial consumption).

Table 2.

Domestic consumption of primary aluminium⁹

| | 1998 | 1999 | 2003 forecast |
|-----------------------------|------|------|------------------|
| Total | 100 | 100 | 100 |
| Foil production | 51.1 | 54.6 | 49.7 |
| Construction | 19.2 | 19.0 | 16.1 |
| Electromechanical | 7.8 | 6.2 | 5.0 |
| Automobile building | 18.9 | 17.8 | 27.3 |
| Aerospace and ship building | 3.0 | 2.4 | 1.9 |

During the last five years, Russian domestic consumption of aluminium has consistently growing by 2-5% annually. There has also been an increase in secondary aluminium production over the past two years - on average about 20% annually.¹⁰ At the same period of time there was a 10%-growth in primary products. Such differing growth rates reflect the wiliness of domestic producers to increase their investment in the secondary aluminium product market.

The existing import tariff for almost all secondary aluminium products is between 15 and 20%. The level proposed by the lobby of industrialists is 25% at the end of the implementation period. At the same time the level demanded by the WTO working

⁸ *Metal statistics, EAA*

⁹ *Economica e gizm #40, 10/1999 (also available at http://www.inves.ru/info/online/overview/1999/e_ob_10/OB991005.HTM)*

¹⁰ Interesting that this growth in many cases was provided by one separate enterprise. For example, 95% of this growth in foil was a result of the increase in production in only one *Sayan Foil Factory*, which is a part of RusAl.

committee is 10%.¹¹ Such a sharp decrease in tariff rates could significantly increase the amount of imported products.

11 plants in Russia produce primary aluminium. Almost all of them increased their production over the last 5 years. They reached 3.4 tons a year in 2000. The economic structure of the main producers is shown in *attachment 3*.

Within the last 1-2 years primary aluminium producers have been trying to stimulate domestic consumption. (the capacity of primary aluminium processing plants is showed in *attachment 4*).

In 2000 primary aluminium production rose by 2.5% compared to 1999 and reached 3.25 million tons. Their working capacities were maximized (loaded up to 99.7%). Bauxite production also demonstrated some growth. At the same time, in 2000 alumina production rose 4.1% and reached 2.46 million tons.

In the world market Russia is a net importer of alumina. Alumina is imported from Guinea, Australia, and Brazil. Primary aluminium production of domestically extracted ore does not exceed 40% of total output. *See Figure 2*.

Figure 2. Structure of the Russian aluminium and alumina production.

¹¹<http://www.wto.ru/documents.asp?f=stats1&t=16> ; <http://www.rg.ru/bussines/econom/152.shtm>

Box 1.

Different producers of primary aluminium have different production technologies, as they were built in different times. They were also oriented on a different bauxite ore sources.

Sayansky aluminium plant is reported to obtain the most advanced burnt anode technology that significantly saves production costs and decreases ecological risks. Bratsky and Krasnoyarsky aluminium plants (that are among the largest in the world) were put into operation in the 70s. Currently, they need to be reconstructed. The renovation was partially started.

Mergers in the branch have been almost completed. Today aluminium and its alloys production is controlled by *RusAl* alliance and *SUAL-Holding*. As a result of the integration process in Russia's aluminium industry, stable groups of companies have been formed. These large structures are permanently the centre of attention of global producers, who initiate anti-dumping investigations and file actions in American courts.

Russian Aluminium Industry as a Part of the World Market

The aluminium market is significantly influenced not only by external markets, but also by energetic and political factors (the acts of terrorism in the US proved this once again). Increasing the share of high value-added production in the total aluminium production has become a main strategic priority in this industry¹².

According to experts, aluminium consumption in highly developed countries is decreasing (see *Figure 3*).¹³ This of course tightens market competition, in which Russian exporters are one of the main players.

The global economic slump is deterring aluminium consumption and it is negatively influencing aluminium prices. On the other hand, Russia has lower costs for primary aluminium production compared with other producers. This is a result of the low domestic tariffs for electricity.

The *primary products* of the Russian aluminium industry are already competitive in the world market. At the same time the competitiveness of the *secondary aluminium products* is low.

¹² For example, only 20% of the production sold by top world producers Alcoa and Alcan consist of semi-finished products, the rest 80% are shipped to the market in a form of high added value finished rolled metal. Russia is to the contrary: domestic consumption is too low, that is why 80% of primary aluminium is exported.

¹³ Metal statistics, EAA, 2001

Figure 3. Geographical distribution of aluminium consumption in highly developed countries

Historically, in Russia the main consumer of the aluminium industry was the military complex. According to different estimations, in 1990 it consumed from 50% to 80% of the industry's output.¹⁴ Beginning from the middle of the 1990s, when the "goszakaz" of the military complex began significantly shrinking, this percentage has been decreasing. As a result, the aluminium industry has been trying to be more oriented towards the consumer market rather than the military complex.

Different studies use the aluminium consumption per capita index (kg per person per annum) as a parameter, which characterizes the country's industrial development level. *Figure 4* shows countries' allocation in accordance with the index.¹⁵

The fact that in Russia aluminium consumption is low and that there is an excess production capacities makes the aluminium industry export-oriented. High value-added industrial consumption in this sector is still insignificant in Russia (see *Figure 9*)¹⁶. Domestic producers of aluminium expect that the situation will improve due to an economic growth that is taking place now.¹⁷ According to primary prognoses, aluminium

¹⁴ *Aluminium Industry Review*, available on: www.aluminium.org

¹⁵ <http://lenta.ru/economy/2000/04/14/aluminium/>

¹⁶ Recently in Russia top domestic producers have started an impressive advertising campaign with a several million dollars cost. It is targeted the broader use of packing and food foil made from aluminium and its alloys in everyday life.

¹⁷ Current annual economic growth in Russia is 4.9% (see *The Economist* for more details)

Figure 4. Aluminium consumption per capita in regions and countries

consumption in Russia will reach 16-20 kg per person by the year 2010¹⁸, which is the level of modern consumption in Europe.

3. Companies' Background

Russian Aluminium is the largest domestic producer of aluminium and is number two in the world aluminum market. It controls 75% of the domestic market and, according to different estimations, from 5% to 10% of the world market of aluminium. *RusAl* is a part of one of the largest and still forming financial and industrial groups - *Siberian Aluminium (SibAl)*. The group has its own banks, insurance companies and different production facilities. According to different estimations, *SibAl* is now growing faster than any other group in Russia.

The company has influence in different sectors of economy. It influences the political life in Russia through its contacts in Russian Parliament and in different executive institutions. The company is highly diversified. In addition to the aluminium market it controls one of the largest domestic automobile producers – *GAZ (Gorkiy Automobile Building Enterprise)*.

The group is getting more multinational. *RusAl* bought bauxites mines in Guinea, and Jamaica. It also controls Nikolaev Bauxite Mine. According to different sources the

¹⁸ <http://lenta.ru/economy/2000/04/14/aluminium/>

group is currently negotiating different investments in Kazakhstan. Such active investments out of the country makes the company more international than other Russian firms. In many senses *RusAl* is very unique for Russia.

Box 2

The main owner and shareholder of each company inside RusAl is *Oleg Deripaska*.

Oleg Deripaska doesn't want to delegate his management and controlling functions to anyone from the top management. It could be a result either of the missing trust between different players inside the company or a specific characteristic of doing business in Russia.

In each company Deripaska is not just nominally but in also in practice the chief of the board, the general director, and CEO. In every instance, he is in a high level position, where he is able to control even the small details of business life in his company. In this sense, *RusAl* could be an example of the "military" conglomerate, in which only a few persons can make decisions (Deripaska and several others who are very close to him).

Mr. Deripaska works hard and demands the same from others. In private interviews, which we collected in the company, employees said that they were unsatisfied of their work. According to them, there is a significant disproportion in their compensation and responsibilities. From the middle level management and higher levels Deripaska asks to work at least 10 hours a day. In many cases it is not enough and staff usually remains in their offices till 10 p.m. making the business day for them 12 or more hours. Mr. Deripaska says that if you want to be a good worker in his company, you need to have no private life.

According to our research, a solid percentage (some estimate around 10%) of those employees who were hired last year are trying to leave the company now. The most common way to leave the company is to sign a contract with *SUAL*. It is the nearest and the biggest competitor of *RusAl* on a domestic market.

SUAL is under control of another rapidly growing group.¹⁹ According to those who are switching from one company to another, the main reason for such step is a different system of management in *SUAL*.

The company was established in 2000 by combining the assets of different owners. It immediately took the leading place in the world hierarchy of its industry because of the resources concentration. As the company controls the top world producers, Bratsk and Krasnoyarsk aluminium factories, and one of the best-equipped and technologically advanced Sayany factory, it is capable to produce around 2 million tons of primary aluminium. It is 10-12% of its overall world production. As well, it is capable of producing rolled products and packaging. Over 75,000 employees work for the company with an annual turnover of more than 4 billion dollars.

¹⁹ *SUAL* assets mostly spread to the works in the Ural region. In 2000 its overall output reached 595,000 tons of primary aluminium, 1.65 million tons of alumina (5% rise compared to the same period in 1999).

RusAl is the vertically integrated company. See the structure of the company on *Figure 5*.²⁰

Figure 5. Organizational structure of RusAl

Bauxite is produced at Nikolaev and Achinsk those are located in the Ukraine and Russia, respectively. A main ore supplier for Nikolaev is *State Bauxite Society* - state-owned company of Guinea. Achinks has its own ore base.

French *Pechiney*, a long-term partner of Russia, elaborated the technology used at Nikolaev. The planned production capacity is over 1 million tons of alumina per annum; in the nearest future the company is intending to grow capacities up to 1.5 million tons. Achinsk uses a home technology; the planned production capacity is 900,000 tons. Alumina, produced at two works, is supplied to Bratsk, Krasnoyarsk and Sayany Works. These works are located in the vicinity of the large generating capacities that allows saving on energy tariffs.

As is the case within other Russian companies, minority shareholder rights in *RusAl* are not protected properly. This lack of protection, along with the nation's inappropriate level of institutional development, negatively affect *RusAl's* growth. The company lacks the opportunity to raise funds through the stock market. Therefore, it is likely that *RusAl* will support the institutional changes in Russia (especially in corporate governance).

SUAL Holding is a smaller player on the local market.²¹ In contrast with *RusAl*, *SUAL* has better sources of the raw material and less capacities for its industrial consumption.

See *Figure6* for the Holding's structure.

²⁰ This information was kindly provided by PR department at RusAl

²¹ *SUAL Holding* controls about 15% of the local market of aluminium

Figure 6. SUAL-Holding Structure

A significant disadvantage of the holding's structure is the necessity to transport alumina from Tymansky deposit of Komi, which has caused an increase in the share of transportation costs in the total price of production (according to the company's top managers, it has now reached 60%).

The competitiveness of RusAl and SUAL Products Competitiveness is highly dependent on total factor productivity. According to *Bessonova's study*, since 1999 there has been a significant gap between changes in total factor productivity in aluminium industry and in non-ferrous metallurgy.²² See Tables 3 and 4.

Table 3.

Total factor productivity in aluminium industry

| Year | Mean | Std. Dev. |
|-------------|-------------|------------------|
| 1994 | -0.47 | 0.46 |
| 1995 | -0.09 | 0.45 |
| 1996 | -0.19 | 0.28 |
| 1997 | -0.25 | 0.81 |
| 1998 | -0.02 | 0.26 |
| 1999 | -0.22 | 0.20 |
| 2000 | -0.13 | 0.19 |

²² Bessonova et al. CEFIR/Moscow

Table 4.

Total factor productivity in non-ferrous metallurgy

| Year | Mean | Std. Dev. |
|------|-------|-----------|
| 1994 | -0.42 | 0.50 |
| 1995 | -0.13 | 0.68 |
| 1996 | -0.23 | 0.37 |
| 1997 | -0.37 | 0.91 |
| 1998 | -0.18 | 0.43 |
| 1999 | 0.04 | 0.70 |
| 2000 | 0.02 | 0.70 |

In addition to the total factor productivity comparison, we interviewed people from *Alcan, SUAL and RusAl* in order to estimate the level of competitiveness of their secondary products.²³ We asked Alcan to grade *SUAL and RusAl*. *SUAL* graded *RusAl* and vice versa. We also asked management of *Alcoa Russia* to comment on these companies' level of products but it declined to do so. We have placed our findings into the following tables:

Table 5.

Change in *RusAl* products competitiveness during 2000-2001

| Product | Growth | | | |
|--------------------------------------|-------------------|---------|---------------|-----------|
| | Above the average | Average | Below average | No growth |
| Semi products | | | — | |
| Final products: | | | | |
| • foil | | — | | |
| • beverage cans | | — | | |
| • construction profiles | | | — | |
| • automobile industry materials | | | — | |
| • electrotechnical industry material | | | — | |

Table 6.

Change in SUAL products competitiveness during last 2000-2001²⁴

| Product | Growth | | | |
|---------------------------------------|-------------------|---------|---------------|-----------|
| | Above the average | Average | Below average | No growth |
| Semi products | | | X | |
| Final products: | | | | |
| • foil | | | X | |
| • beverage cans | | | | |
| • construction profiles | | | | |
| • automobile industry materials | | | X | |
| • electromechanical industry material | | X | | |

Finally, we concluded that there is a progress in the level of competitiveness in *RusAl's* and *SUAL's* secondary products. At the same time, the increase is not enough for giving this industry *infant status* as has been asked for by this sector's lobbying body.

4. Conclusions and policy recommendations

Conclusions:

- The advantage of Russian primary aluminium producers advantage is the significantly lower cost of electricity it pays compared with their competitors. As a result, they will benefit from the WTO accession because of the better access to the world market;
- Joining the WTO Agreement on *Dispute Settlements* will decrease the number of unsettled disputes between Russian producers and other countries (mostly applicable for Russian exporters to the U.S. market);
- There is a significant decrease in total factor productivity in the aluminium industry, as compared with the non-ferrous industry;
- The level of competitiveness of secondary aluminium products has not change significantly during the last two years;
- The expected decrease in the level of import tariffs will increase competition on the secondary aluminium products market. This could knock out some producers

²³ The primary aluminium products are already competitive on the world market and there was no need to grade their level.

²⁴ Beverage cans and construction profiles are not applicable for *SUAL* Holding

from the market. It will also motivate the remaining producers to increase their level of competitiveness;

- Accession will affect domestic consumers. A decrease in prices for secondary aluminium products should be expected. At the same time, the level of product quality in the domestic market will increase;
- As a result of trade liberalization, an increase in the number of those who are employed by primary aluminium production and a decrease in secondary production employment should be expected.

Policy recommendations:

- The country's accession into WTO should be supported;
- Due to the possible decrease in a number of employees in the secondary aluminium production it is necessary to create an *Active Labor Market Policy (ALMP)* in this sector of the industry;
- Investments into the secondary aluminium productions should be supported through different mechanisms (i.e., tax holidays during implementation period);
- The WTO mechanisms of dispute settlements in anti-dumping cases against Russian primary aluminium producers should be effectively used in order to protect Russian exporters;
- Competition in the domestic secondary aluminium products market should be provided through effective import policy.

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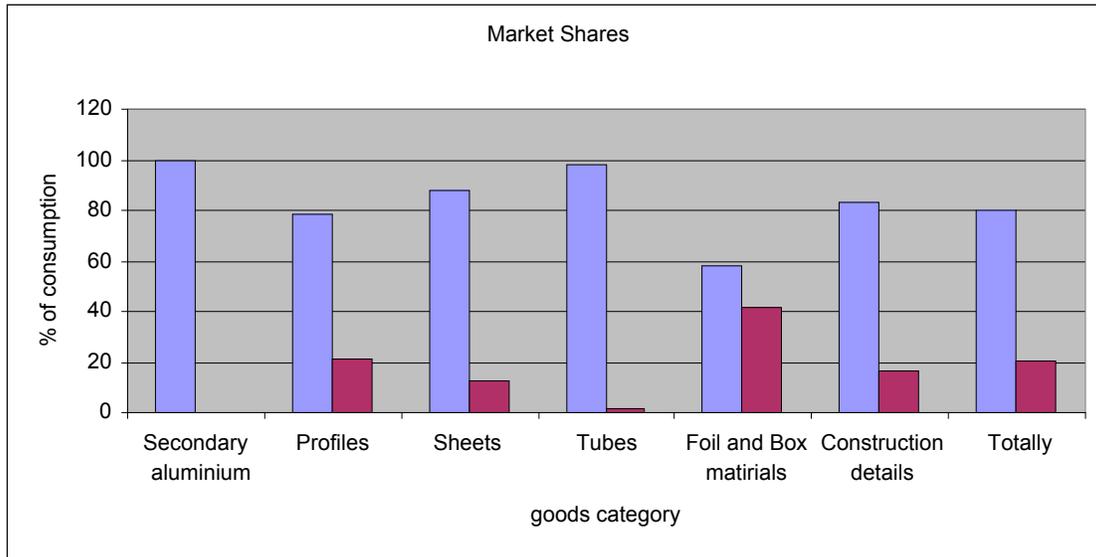
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Attachment 1.

Change in export and domestic consumption of aluminium industry, % of annual domestic production

| Year | Export | Domestic consumption |
|------|--------|----------------------|
| 1991 | 86.5 | 13.5 |
| 1992 | 83.2 | 16.8 |
| 1993 | 83 | 17 |
| 1994 | 81.9 | 18.1 |
| 1995 | 82.3 | 17.7 |
| 1996 | 80.8 | 19.2 |
| 1997 | 80.5 | 19.5 |
| 1998 | 80.4 | 19.6 |
| 1999 | 80.2 | 19.8 |
| 2000 | 80.1 | 19.9 |
| 2001 | 79.8 | 20.2 |

Attachment 2.



Attachment 3.

Primary aluminium producing companies

| Aluminium plant (AP) | Region | Electric power station | Production in 1999, thousand tons |
|----------------------|-------------------|---|-----------------------------------|
| Bratsk AP | Irkutsk region. | Bratskaya HES | 870,0 |
| Krasnoyarsk AP | Krasnoyarsky krai | Krasnoyarskaya HRES-2, Berezovskaya HRES-1 | 836,5 |
| Sayansk AP | Khakasia | Sayano-Shushenskaya HES | 385,8 |
| Novokuznetsk AP | Kemerov region | 3 HRES "KuzbasEnergo" | 273,5 |
| Irkutsk AP | Irkutsk region | 13-GRES and 4-HES IrkutskEnergo | 260,0 |
| Bogoslovsk AP | Sverdlovsk region | "SverdlovkEnergo" | 158,5 |
| Volgogradsk AP | Volgograd region | Volzhskaya HES | 128,0 |
| Ural AP | Sverdlovsk region | "SverdlovEnergo" | 85,0 |
| Kandalakshitsk AP | Murmansk region | n/a | 68,1 |
| Nadvoitsk AP | Karelia | Vikhskiye HES | 62,0 |
| Volkhovsk AP | Leningrad region | Volkhovskaya HES | 17,0 |
| Total | | | 3144,4 |

Attachment 4.

Primary aluminium processing manufacturing facilities in Russia

| Metallurgical Plants | Region | Planned production capacity, thousand tons | Real output in 1999, thousand tons |
|------------------------------------|-------------------|--|------------------------------------|
| Samarsk MP | Kuibishev region | 800 | 85 |
| Krasnoyarsk MP | Krasnoyarsk krai | 260 | 120 |
| Belokalitvenskoye IPA* | Rostov region | 100 | 30 |
| Stupino Metallurgical Company | Moscow region | n/a | 20 |
| Kamensk-Uralsky Iron & Steel Works | Sverdlovsk region | n/a | 35,5 |
| Mikhailovsk Foil-Rolling Mill | Sverdlovsk region | n/a | 30 |
| OJSV* Foil-Rolling Mill | Saint-Petersburg | 40 | 20 |
| Sayansk Foil-Rolling Mill | Khakasia | 47.6 | 20.4 |