

RUSSIA

By Interfax-M&CN

Russia remains one of the world's largest mineral producers. According to the Russian Ministry of Natural Resources, the potential value of the confirmed, explored and estimated mineral reserves exceeds US\$28,000 billion, of which gas accounts for 32.2%, coal and shale for 23.3%, oil for 15.7%, non-ore commodities for 14.7%, iron for 6.8%, nonferrous metals and rare earths for 6.3%, and gold, platinum, silver and diamonds for 1%.

In 2000, Russian geologists discovered probable resources of 1,350 t of lode gold, 500 t of placer gold, 500 t of platinum-group metals, 1,100 Mct of diamonds, 165,000 t of uranium, 27 Mt of copper and 35 Mt of lead and zinc. Geological study covered 440,000 km², geochemical studies 286,300 km² and hydro-geological studies 46,000 km². Several new territories were appraised and new ore provinces identified. New methods were devised to mill the ores of scarce metals like manganese, titanium and chrome. Now, geologists will be able to reappraise carbonate and oxidised manganese ores at deposits in the Krasnoyarsk territory, Kemerovo and Irkutsk regions. And a resource-base was prepared for thermal coal in Evenkiya, the Irkutsk region, Khabarovsk and Primorye territories. Besides, in 2000, Russia has explored new deposits at allocated seabed sections of the Pacific Ocean which contain an estimated resource of 133 Mt of manganese, 6.4 Mt of nickel, 5 Mt of copper and more than 1 Mt of cobalt.

Russia's economy continues to follow a growth path. The economy has benefited from high prices for oil and raw materials on the world markets. Russian GDP grew by 7.6% in 2000 to Rb6,940 billion, industrial production rose 9%, capital investment increased 17.7%. Meanwhile, economic growth in Russia is expected to slow down in 2001 with many indicators falling below 2000

levels. Experts say, however, that if all steps to advance the economy laid out in the government programme are taken, the most important macroeconomic indicators in 2001 may be higher than forecasted.

In 2000, Russia mined 225 Mt of ore, of which 86.6 Mt was of agglomerated ore and more than 45 Mt of nonferrous ore. It produced 2.9 Mt of copper concentrates, 330,000 t of zinc concentrates and 6,800 t of tungsten concentrates.

Russia's ferrous and nonferrous metals industries increased output by 15.6% and 11.3%, respectively, in 2000. The growth was fuelled by improvements in company finances and the structure of production, and by consolidation. Russia produced 3.1% more primary aluminium than in 1999. Production figures grew 16% for titanium sponge, 11.8% for refined copper, 7% for nickel, 4.2% for zinc and 35.8% for tin. Lead production fell by 7.3%. Russia produced 2.1% more metallic molybdenum while output of metallic tungsten fell by 9.8%.

Russian metals exports rose by 19.8% last year to US\$16.3 billion. The ferrous metals industry exported 56% of output, while the nonferrous sector exported 60%. The country exported 25.9 Mt of rolled steel last year, down from 26.5 Mt in 1999. But export revenues rose 23% due to changes in average annual export prices and the structure of products exported. Semi-manufactures made up about 40% of ferrous exports. Export volumes were up 4% for aluminium, 1% for copper and 26% for nonferrous metal products.

In 2000, Russian steel makers increased domestic sales by 46.9% to 22.9 Mt on demand from the engineering, construction, oil, oil refining, gas, chemicals and petrochemicals industries. Nonferrous

producers upped domestic sales of aluminium by 17%, copper by 14% and nickel by 7.5%. Growth in aluminium consumption boosted aluminium product output by 28%, and Russia produced more foil, electric engineering products and food packaging from aluminium. Production figures also rose by 28% for copper roll, 48% for bronze roll and 22% for brass roll, hence the increase in domestic copper supplies. Nickel supplies to Russian consumers increased as stainless steel production soared by more than a third.

Investment in Russia's metallurgy sector rose by 25% last year in constant prices and totaled about Rb40 billion (US\$1.42 billion). This included Rb16 billion (US\$567 million) invested in the ferrous metals industry, and Rb24 billion (US\$853 million) in the nonferrous sector. The growth was mostly financed by companies' own resources. The volume of borrowing to replace production assets remains low. Profits financed about 62% of capital investment in the ferrous sector and 75% in nonferrous, and amortisation accounted for respectively 35% and 23%.

Russia is still focusing on improving its production-sharing agreements (PSA) legislation that can boost the economy. The Centre for Strategic Developments, responsible for working out Russia's economic strategy, estimates that foreign investment in the Russian economy could amount to about US\$85 billion over the next five to seven years if large production sharing agreements are implemented.

In December 2000, Russia's State Duma passed amendments to a law on production sharing agreements that clarify the transfer of rights and obligations in the reorganisation of an investor. The changes would establish special procedures to be used in cases in which the rights and obligations on PSAs are transferred to companies that are formed as the result of a reorganisation of the investing company. The procedures coincide with the Civil Code. The bill requires that the rights

and guarantees of the state be protected as the creditor in a reorganisation of the investing company, and specifies that the rights of the state require an early break in the agreement. The bill also states that a transfer of the licence to use underground resources in the event of succession in the reorganisation of the investor must be conducted within 30 days of completion of the reorganisation.

In February 2001, Russian Prime Minister Mikhail Kasyanov signed a resolution delegating the functions of various ministries with respect to the drafting, signing and implementation of PSAs. Resolution No. 86 states that the Economic Development and Trade Ministry will be responsible for Russia's rights and commitments in PSAs. However the government itself will deal with the most crucial PSA - related issues. It will sign, amend and dissolve agreements, decide how the states share of production will be disposed of, approve the terms of tenders and auctions for the right to sign PSAs and allocate customs concessions and the like.

Meanwhile, Russian mining and metals companies want to see the broader use of PSAs in their sector. The experts of the State Duma Industry Committee do not currently see any legislative reason why mining companies should not be allowed to work under PSA. To have a number of deposits mined under these terms would improve the quality of resource use, and expand and strengthen the foundations for metallurgical production. The following major deposits are thought likely to attract investors if developed under PSA terms: Sukhoi Log (gold, Irkutsk region), Kyuchus (gold, Yakutia), Udokan (copper, Chita region), Chiney (vanadium-titanium-iron ore, Chita region), Porozhinskoye (manganese, Krasnoyarsk territory), Tyrnyauz (tungsten-molybdenum, Kabardino-Balkaria) and Tomtor (niobium, Yakutia).

Iron Ore

Russia contains roughly 25% of the world's iron ore reserves and its steel industry seems to be adequately supplied with its main raw material in the long term. However, Russia's iron ore reserves are not evenly distributed on a regional scale, and over 70% of them are in the central and northern areas of European Russia. Competitive deposits do not exist in the major steel-producing regions. Thus, over 60% of Russia's capacity to mine iron ore and around 75% of its iron ore reserves at commercial developments are in central and northwest European Russia.

Russia produced 86.63 Mt of iron ore in 2000, up 6.5% year-on-year. Companies produced 81.04 Mt of iron ore concentrate, up 8.8% year-on-year, and 30.76 Mt of iron ore pellets, up 4.7%. Industry experts attribute the growth in production to a rise in demand for raw materials from Russia's metallurgical companies.

Russia exported 15.37 Mt of iron-ore commodities last year, up 36.8% from 1999. This included 6.86 Mt of concentrates and 8.49 Mt of pellets. The increase in exports was largely due to bigger sales to Ukraine. Exports of iron-ore commodities to Ukraine jumped 107.6% to 7.42 Mt, including 5.2 Mt of concentrate and 2.21 Mt of pellets. Iron-ore exports outside the CIS edged up by just 3.8% to 7.95 Mt.

In 2000, Lebedinsky GOK, Russia's biggest iron ore producer, raised concentrate output (more than 68% Fe) by 9% over 1999 to 18.3 Mt. Pellet production rose by 9% to 8.5 Mt, and ore output rose by 7.7% to 45 Mt. Lebedinsky GOK invested about Rb300 million (US\$10.6 million) in upgrades. The main targets were the second and fourth roasters at the pelletising plant. Their production will be 10% higher, gas consumption 20% lower and electricity consumption 15% lower than at the other two roasters.

Mikhailovsky GOK (20.1% of Russia's output), produced 17.5 Mt of iron ore commodities in 2000, 17.6% more than in 1999. Stoilensky GOK (14.0% in total output) increased production by 19.3% to 12.13 Mt of iron ore, Kachkanarsky GOK (8.9%) - by 4.6% to 7.72 Mt, Olenegorsky GOK (4.5%) - by 3.8% to 3.87 Mt, Korshunovsky GOK (4.0%) - by 9.3% to 3.48 Mt. Kovdorsky GOK (3.7%) failed to increase output, producing 3.22 Mt, while Kostomusksky GOK (8.1%) decreased production by 6.8% to 7.01 Mt.

Aluminium

Russia is among the world's leading producers of primary aluminium, and is the biggest producer in the CIS. The aluminium smelters at Bratsk, Krasnoyarsk, Sayansk and Novokuznetsk in Siberia, and the SUAL company (which operates the Irkutsk and Uralsky smelters) account for over 85% of Russian aluminium production.

Russian Aluminium Co., which emerged in 2000 and which controls more than 70% of the Russian aluminium market, produced 2.136 Mt of primary aluminium, 2.4% more than the 2.085 Mt achieved by the same enterprises in 1999. Output rose by 3.7% to 895,272 t at Bratsk (Irkutsk region), by 0.2% to 838,377 t at Krasnoyarsk; and by 4.2% to 402,796 t at Sayan SK (Khakasia).

In 2000, SUAL-Holding increased output by 4.5% to 594,400 t of primary aluminium. SUAL-Holding controls 20% of Russian primary aluminium production and about 40% of alumina capacity. It controls 16 enterprises in seven regions of Russia, among them the Murmansk, Sverdlovsk, Chelyabinsk, Irkutsk and Kirov regions, and the republics of Buryatia and Komi.

Despite steady growth in aluminium output, the raw mineral base remained in an unsatisfactory state, and the sector was still relying heavily on raw material imports. Russia is currently producing only 40% of its aluminium from its own raw material.

The situation could change for the better when the Sredne-Timan bauxite deposit comes on stream. The Sredne-Timan bauxite field should be producing 1.5 Mt of bauxite in 2003, rising to 2.55 Mt in 2005. Projected capacity of 6.5 Mt should be achieved by 2020. The Sredne-Timan field holds a proven 260 Mt of bauxite, 30% of all bauxite reserves in Russia. More than 90% of them can be mined by open pit. Boksity Timana, the company set up to mine the field, is owned by the Komi Economic Development Fund and SUAL, whose enterprises will be the biggest consumers of the bauxite mined.

In 2000, Sevuralboksitruda, a bauxite producer from the Sverdlovsk region, produced 2.4% more bauxite than in 1999. It declined to say how much bauxite it mined, citing state secrecy. The profit margin on extraction was 3.6%. The company intends during 2000-2005 to sustain annual mine output growth of 1-4% and eventually to raise production to 4.22 Mt/y of bauxite.

In October 2000, Bogoslovsky Aluminium (BAZ) of the Sverdlovsk region won a tender for the right to develop the Toshemskaya group of bauxite deposits. The group includes the Toshemskoye deposit and two other occurrences, Peshinskoye and Novaya, which are all 45 km north of the city of Ivdel and 37 km from the Polnochnoye rail station. Geologists have explored seven orebodies at the Toshemskoye field. Their content up to ground water level consists of 52.93% alumina, 17.64% silica, 0.21% sulphur and 2.56% carbon dioxide. The Peshinskaya mineralisation contains three orebodies with 46.42% alumina, 17.42% silica, 0.06% sulphur and 2.5% carbon dioxide. And the Novaya mineralisation contains 46.1% alumina, 15.94% silica, 0.11% sulphur and 0.98% carbon dioxide. The company is required to start commercial mining by July 31, 2002. BAZ plans to invest about Rb50 million in the project. It will consume most of the bauxite itself.

In 2000-2005, the Severo-Onezhsky bauxite mine Russia's Arkhangelsk region intends to mine and supply consumers with at least 3.06 Mt of bauxite. Production had slumped from 714,000 t of bauxites in 1990 to 217,600 t in 1998, stabilising in 1999. The company develops the western section of the Belovodskaya bauxite deposit, which holds 22% of Russia's entire bauxite reserves. Most of the output is consumed by steel maker Severstal, which used bauxites as flux material for steel smelting.

The Achinsk Alumina Combine, in Russia's Krasnoyarsk territory, one of Russian biggest alumina producers, increased output by 13% from 763,500 t to 862,500 t in 2000. Nearly all of the alumina was consumed by enterprises whose commodity and input flows are controlled by Russian Aluminium. To 2010 Achinsky Alumina Combine will open an additional 70,000 t/y of alumina capacity through a reprofiling of its cement plant ovens to alumina production. Alumina output will reach 1 Mt/y.

Boksitogorsk Glinozyom, an alumina producer from Russia's Leningrad region, raised alumina production 25% over 1999. Figures doubled for gallium and rose 34% for aluminium hydroxide. Investments last year came to Rb73.7 million (US\$2.6 million), of which Rb36.4 million was to acquire a boiler and install a stack chimney at the company's CHP plant; Rb15.8 million to buy part of the land which the industrial premises occupy; Rb5.6 million to prepare the Malogorskoye bauxite field; and Rb2.4 million to overhaul the alumina division's carbonisation plant. Glinozyom started to prepare the Malogorskoye deposit for development in 1999, but it will not go commercially on stream until the existing Radynskoye deposit has been worked out. The new deposit will enable the company to produce alumina and abrasive materials (corundum), refractory body and coagulents. Other sources of raw materials are the Podsosnensky bauxite mine and various limestone quarries.

Glinozyom, an alumina producer from Pikalevo in the Leningrad region, produced 190,600 t of alumina in 2000, 10.6% less than in 1999. The production fell after prices for nepheline concentrate, which is supplied by Apatit, a company from the Murmansk region, rose too far. In the summer of last year, Glinozyom signed a contract to 2005 by which Apatit committed itself to supplying about 5.4 Mt of concentrate per year with payments received on time. Glinozyom also produces aluminium hydroxide, cement, soda, potash, bricks and shingle.

Nickel and Copper

Norilsk Nickel is the world's largest producer of nickel, cobalt and platinum group metals (PGM). The company produces around 20% of the world's nickel, 5% of its copper and 40-60% of the PGM. The company produces 91% of Russia's nickel, 57% of its copper, 80% of its cobalt, and 95% of its PGM.

Norilsk Nickel's main resource base consists of two unique fields in the Talnakhskoye ore formation in the Norilsk industrial zone - Talnakhskoye and Oktyabrskoye fields. Rich ores containing 48% nickel, 38% copper, 47% cobalt and about 30% PGM are the most valuable and intensively developed. The Talnakhskoye ore formation is mined by a number of underground operations - Mayak, Komsomolsky, Oktyabrsky, Taimyr, Skalisty (in production), and Gluboky (reserve). The Norilsk-1 field is also being developed from the Medvezhy Ruchi open pit and Zapolyarny underground mine. The ore-fields in the Norilsk area also have industrial concentrations of platinum (Pt), palladium (Pd), iridium (Ir), rhodium (Rh), osmium (Os) and ruthenium (Ru).

Pechenganickel (a division of Norilsk Nickel) mines nickel and copper ore on the Kola Peninsula-Kotselvaara, Semiletka, Zapolyarnoye, Zhdanovskoye, Bystrinskoye, and Tundrovoye. All of these areas have been explored extensively. The reserves are being extracted through the central and west open pits in the Zhdanovskoye field and the

Kaula-Kotselvaara underground mines at Kotselvaara and Semiletka, and the Severny mine at Zapolyarnoye.

Norilsk Nickel invested US\$400 million of its own funds in upgrading its facilities last year, and plans to spend at least US\$600 million for the same purpose in 2001. This volume of investment is envisaged by an earlier concept for upgrading the company plants at a cost of US\$3.5 billion by 2010. This concept was approved by the company's board of directors in 1998. The bulk of the investment is scheduled for the first three to four years and is mostly intended for the mining and ore-processing sectors. The implementation of the programme will start in 2002.

In February 2001, Norilsk Mining Co. (NGK) and Finland's Outokumpu signed a comprehensive co-operation agreement. The agreement allows for the possible creation of joint ventures to produce metals and metal products, as well as raw materials for them. Outokumpu will also develop and supply technology to modernise and expand NGK's production units.

In September 2000, Norilsk Nickel announced a massive restructuring which will make the parent company Norilsk Nickel a subsidiary of Norilsk Mining Co. All of the company's fixed assets will be transferred to Norilsk Mining Co. Current Norilsk Nickel shareholders will hold 85.5% of Norilsk Mining, and former shareholders of trading company Norimet Ltd will hold 11.5%.

In 2000, Yuzhpolimetall, a wholly-owned subsidiary of the Yuzhuranikel Combine, produced about 9,000 t of nickel, 233% more than in 1999. The biggest owners of Yuzhuranikel Combine are Uraltransgaz and Orenburg Copper-Nickel Co., founded by the Orenburg regional administration. The combine is run by Uralmetprom, an affiliate of Uraltransgaz.

Yuzhuranikel Combine mines nickel ore at the Sakharinskoye field in the Chelyabinsk

region and Buruktalskoye in the Orenburg region. Yuzhpolimetal, which is a limited liability company, leases the combine's hydro- and pyro-metallurgical plants. The Sakharinskoye and Buruktalskoye deposits contain Russia's leanest nickel ore and just 1% of the country's entire geological reserves. But the tailings that have built up over the past 60 years have a nickel content as high as 11% and contain between 8,000 t and 12,000 t of the metal. Yuzhuralnikel is already recovering 100-150 t of nickel per month from the waste and intends to increase this production.

In October 2000, Rezhnikel Production Association, a subsidiary of the Rezh Nickel Works of the Sverdlovsk region, has won a tender for the right to study and mine nickel ores in the Talov section of the Aktai nickel field. The 24 km² section is in the Verkhotinsky municipality. It contains a forecast 130,000 t of nickel, average Ni content in ore 1.1%, but these reserves have not been appraised and require prospecting and exploration. The company should shortly receive a 25-year licence and would be required to start commercial mining by July 30, 2007. Rezhnikel plans to invest Rb155 million (US\$5.5 million) in the project. It will consume most of the nickel it mines. The Rezh works has the capacity to produce 9,000 t/y of nickel. The main raw materials are nickel ores from the Serov and Cheremshan deposits in the Urals.

Russia's second biggest refined copper producer is Uralektromed from Sverdlovsk region, in the Urals. It which operates a local copper mine named Safyanovskaya and produced 311,000 t of cathode copper in 2000, compared with 271,000 t in 1999. Uralektromed is the core enterprise of Urals Mining and Metallurgical Co. (UGMK), a holding company set up in November 1999. The other members include the Kirovgrad Metallurgical Co., Gaisky GOK copper mines, Safyanovskaya the Svyatogor and Sredneuralsk smelters, Kirov Nonferrous Metals Plant, Sibkabel, KATUR-invest,

Shadrinsky engine and radiator plant, Uralektromed-vtortsvetmet, Bogoslovskoye mine amalgamation and Verkh-Neivinsky Nonferrous Metals Plant.

Uralektromed intends in 2001 to spend US\$350,000 or more on upgrading its electrolytic powder division. Commercial tests are under way to obtain heavy powder. This is more suited for sintering. In 2001, the drying line will be modernised to improve the quality of powders. In time, the division will produce up to 200 t of powder per year for the smelter's copper products division.

In January 2001, Uralektromed launched a facility to smelt up to 15,000 t/y of blister copper waste. The waste would consist of anode slag generated at Uralektromed itself and of bronze-brass scrap. The anode slag will be reprocessed using an up-to-date method to achieve recoveries of 5% for copper and 10% for precious metals. In time, zinc, tin, lead and nickel will also be recovered from the waste. The complex to reprocess copper waste cost a total of US\$3.5 million and was financed by Uralektromed. Uralektromed said in the past it would take no longer than a year to 18 months to recoup the costs as up to 40% of the copper in the waste would be utilised. The complex will be controlled by Uralektromed itself, not the plant's Uralektromed-Vtortsvetmet subsidiary, which processes nonferrous scrap and supplies raw material to the parent company, and already produces about 200,000 t/y of blister copper.

The third-largest Russian refined copper producer is Kyshtym Copper Electrolyte Works in the Chelyabinsk region. In 2000, it produced 77,034 t of refined copper, up 20% year-on-year. Production figures rose 38% to 1,226 t for copper foil and 50% to 8,342 t for wire rod.

Kyshtym Copper Electrolyte Works is not planning to raise production of core items except copper foil in 2001. Figures will total around 77,000 t of refined copper, 10,000-

11,000 t of copper vitriol and 8,000 t of copper wire-rod. However they will rise 46.8% to 1,800 t of foil thanks to upgrades at the foil mill. US-manufactured equipment is being installed at the mill, which will have the capacity for about 3,000 t/y of zinc-coated foil. The costs are US\$10 million, of which the works has paid US\$3 million so far. Full capacity will not be achieved before 2002. The works also intends to invest Rb150 million in construction and installation of a sulphuric acid complex at Karabashmed, a blister copper smelter in the Chelyabinsk region which Kyshtym owns.

By 2002, Karabashmed plans to double copper production to 60,000 t. Members of the so-called Chelyabinsk copper holding company will provide the smelter with about half of its raw material. Uchalinsky GOK will supply 27,000 t/y of concentrate, and the Bashkir copper-sulphur plant 5,480 t/y. The remainder should be provided by Alexandrinskaya Mining Co., from its copper-zinc mines in the Chelyabinsk region, and from Ormet in the Orenburg region, which can meet 5% of the Karabash smelter's demand for concentrates. The Chelyabinsk copper holding was created at the end of 1999. It includes the Kyshtym Copper Electrolyte Works, Karabashmed, South Urals Mining Co., Uchalinsky GOK mining complex, Gurebayevskoye mining company and Bashkir Copper Sulphur Plant. Thus, the holding does everything from mining to refining of copper.

Uchalinsky GOK of Bashkortostan mined 3.464 Mt of copper ore in 2000, 7% more than in 1999. The company's net profits were down 37.8%, and pre-tax profits fell 40.6%, as unit costs rose with the partial switch early in the year to deep mining. By the end of 2001, Uchalinsky intends to complete upgrades which will raise ore processing by 20% to 3.8 Mt/y. Milling capacity has already been augmented by 8% to 1.4 Mt/y.

Lead and Zinc

In 2000, Russia produced 241,025 t of zinc against 231,310 t in 1999. Output of lead decreased to 51,501 t in comparison with 55,260 t in 1999 because the agglomerating plant at Elektrotink closed for environmental reasons. Moreover, 96% of the lead was produced from secondary materials.

In 2000, Chelyabinsk Electrolyte Zinc Works, Russia's biggest zinc producer, produced about 143,000 t of zinc, 3-4% more than in 1999 and more than it has ever produced since going into operation in 1935. Design capacity is 130,000 t of zinc and 200,000 t of concentrated sulphuric acid, cadmium, indium, and products containing precious and rare metals. Euromin AG of Switzerland owns 51.74% of the shares, employees 6.2% and the local Chelindbank 6.15%. Most of the raw material comes to the works from the Uchaly GOK, the Gaisky GOK of Orenburg region, the Sibaisky GOK of Bashkortostan and the Alexandrinskaya mining company.

The operation sold about 75% of its output in Russia, 7% less in terms of value than in 1999. However, in tonnage terms, domestic sales increased by 3.2%. Steel giant Severstal, and the Novolipetsk and Magnitogorsk metallurgical combines, were again the company's biggest consumers.

In October 2000, the European Bank for Reconstruction and Development provided a loan of US\$15 million to Chelyabinsk. The credit will be disbursed in several tranches and with repayment in six years. Chelyabinsk intends to use the credit to complete, work which began in 1989, to produce up to 200,000 t/y of special high-grade. The project should be complete by 2007. Eventually, annual output will increase by 23%.

The Belovo zinc works, a small producer in the Kemerovo region, increased output last year by 27.9% to 3,640 t, plus 2,167 t of zinc powder, which the plant did not produce in 1999. Even so, the company closed 2000 with a balance-sheet loss, down 25.7% year-

on-year. It also financed on-going maintenance of some equipment at a cost of more than Rb5 million in an effort to steady production levels. The Belovo works went under court management in March 1999 for a period of 12 months. This was extended by six months in April 2000. In November, the Kemerovo region's arbitration court adjudged the company bankrupt.

At the beginning of 2001 Dalpolimetall, a major producer of lead and zinc concentrates containing precious metals from Russia's far-eastern Primorye territory, was on the verge of standstill because a resolution on quotas for exports of precious metals in 2001 had yet to be signed. It is not technically capable of recovering precious metals from concentrates, and has to have this done abroad. Dalpolimetall exports more than 80% of its output, chiefly to the Asia-Pacific region. By the middle of January 2000, its stockpiles contained a month's worth of output - 5,000 t of concentrates valued at US\$800,000.

Dalpolimetall said it produced 700,000 t of polymetallic ore in 2000, 8.9% more than in 1999. Output was Rb347.4 million in value, 3.4% higher. The company produces more than 70% of Russia's lead concentrates and 14% of its zinc concentrates. It also produces metallic lead, bismuth and zinc. In 2000, Dalpolimetall cleared US\$1.8 million of a US\$10 million debt to its biggest creditor, Switzerland's Glencore International. It is due to pay off the whole debt by 2004.

The highlight of 2001 for Dalpolimetall will be putting the new Maiminovskoye lead-zinc and silver mine on stream. The Natural Resources Ministry has said the ores average 1.1% Zn, 2.7-3.6% Pb and 59 g/t Ag.

A new player is expected to appear on the Russian lead and zinc market. Urals Mining and Metallurgical Co. (UGMK) plans in September of 2001 to commission three new divisions to produce zinc and lead, with a combined annual capacity of 68,000 t of zinc and 17,000 t of lead. The UGMK zinc project

costs are about US\$70 million. The new divisions would be accommodated at the Uralelektromed, Svyatogor and Kirovgrad copper plants. Most of the zinc will be produced by Svyatogor and Uralelektromed. The former will produce concentrate, which will be sent to the latter for electrolysis. Capacity will be 60,000 t/y of electrolyte zinc. Also, Uralelektromed plans to build a facility to produce 12,000 t/y of lead. The Kirovgrad plant will gain 8,000 t/t capacity for zinc and 5,000 t/y for lead.

The Kirovograd plant's new division will be completed in the near future. It will have a smelter to process tin and precious metals - containing lead ores to produce lead anodes, and an electro-metallurgical plant to obtain C3 grade zinc from zinc oxide. Kirovograd will use the lead anodes to produce cathode lead and then pure C0 and C1 lead, plus a slurry that can be reprocessed to recover precious metals. The precious metals will be recovered at the Verkh-Neivinsk nonferrous metals processing plant. The new facilities are being created to recycle industrial waste at the Sredneuralsk, Krasnouralsk and other enterprises within UGMK.

Russia's self-sufficiency in lead and zinc is likely to improve soon. The Goryevsky mining and beneficiation plant (Goryevsky GOK), which exploits Russia's biggest lead field, Goryevskoye in Krasnoyarsk territory, plans to boost mine output for both zinc and lead by putting new open-pit sections on stream. The GOK, 70%-owned by the government, was producing about 60,000 t of ore per year, although its projected capacity was 2 Mt. The GOK will shortly put the second stage of the open pit on stream to eventually increase production to 400,000 t/y. But local specialists have come up with plans to switch from open pit to deep mining which would increase production of lead and zinc concentrate without raising ore extraction volumes significantly. The ores currently being mined have a lead content of 6%, but this could increase to 15.5% in a deep mine operation.

The GOK would build a hydrometallurgical plant to recover metallic zinc from concentrates aided by electrolysis. It would also obtain by-product lead oxide, zinc compounds, silver, bismuth and cadmium. If the project is implemented, the GOK could be producing 50,000 t of lead-zinc concentrate from 250,000 t of ore per year. This would yield 25,000-30,000 t of lead products, 5,000-7,000 t of zinc and 20-25 t of silver. Project costs were estimated at Rb1.6-2 billion (US\$56-71 million) on January 1, 2000. The Goryevskoye field's A+B+C1 lead reserves constitute 42% of Russia's entire reserves, the other 58% being located at as many as 94 different sites. The field contains 2.5% of Russia's A+B+C1 zinc reserves.

Tin

In 2000, Russian tin production rose dramatically mainly through higher secondary production although primary output increased by 10.8%.

Novosibirsk Tin Combine (NOK), Russia's biggest tin producer, raised output by 36% over 1999 to 5,236 t. Figures also rose 10% to 2,900 t for solders, 36% to 1,600 t for lead products, and 33% to 1,900 t for rare metals and other products.

NOK plans to raise output by 15-20% in 2001. Production will increase owing to the acquisition of concentrate suppliers, in which NOK owns controlling or blocking stakes. NOK owns 54.5% of the shares in Dalolovo of the Primorye territory, 15% of Deputatskolovo in Yakutia, 50% of Tianshanolovo in Kyrgyzstan and 50.6% of Khinganksoye olovo in the Jewish Autonomous Region (Russian far east). These mines are all rehabilitating and boosting output. They should be producing enough concentrate to meet 80% of NOK's requirements: Dalolovo 8-10%, Deputatskolovo 10-15%, and Khinganskoye olovo and Tianshanolovo 10-15% each. Within two years the mines should be covering NOK's entire raw materials requirement.

In 2001, NOK also intends to boost output of new products - pure lead and bismuth. A new division for these was started at the end of last year. By the start of 2001, NOK had already produced 308 t of pure lead and 15 t of pure bismuth. This year, production should grow by 207% and 200% respectively. Revenues from the new products should total US\$100,000. The lead will be used by NOK to make solders.

Titanium

Russia does not mine titanium-containing ores and has to import ilmenite concentrates from Ukraine. Russia, however, has several titanium deposits, both alluvial and lode. Some of them are being prepared for commercial development, but preparation has been hampered, mainly, by severe lack of finance. Russia currently needs 150,500 t/y of ilmenite concentrate. This requirement will rise to 374,800 t by 2005. The ilmenite-rutile deposits closest to going commercially on stream are Turganskoye (Tomsk region), Tarskoye (Omsk region), the eastern section of the Tsentralnoye deposit (Tambov region) and the Itaman section of the Lukoyanov deposit. These deposits also contain a large amount of zirconium and are capable of meeting most of Russia's requirement for this mineral, which is up to 60,000 t/y.

In March 2001, Garantiya, a Nizhny Novgorod bank, gained control of Geostar, the company that holds the licence to develop the major Lukoyanov titanium and zirconium deposit. The deposit, in the Nizhny Novgorod region, is one of the country's biggest sources of titanium and its biggest zirconium resource. The bank recently acquired the right to most of Geostar's indebtedness and bought 40% of its equity.

In 2001, Garantiya intends to set aside several million dollars to restart the Lukoyanov project and to begin to raise the estimated US\$30 million it will cost to put the deposit commercially on stream. Development and the construction of an experimental mining and milling plant were to

have begun in 1995, according to the licence terms. However, the company was unable to meet the deadline due to financial constraints. Geostar stopped financing the project entirely in 1998, and was placed under court trusteeship for a period of 12 months in June 2000. Lukoyanov's reserves are big enough to warrant the construction of a facility to mine 2.0-2.5 Mt/y of ore. The minerals are no more than 30 m below surface. The deposit also contains rutile and an ilmenite-chromite-hematite product that can be used to obtain sands for the glass and building industries. Besides concentrates, the mining complex would produce fittings for items made from ilmenite-chromite-haematite concentrate.

AVISMA, Russia's only producer of titanium sponge, supplies raw materials to Verkhnyaya Salda Metallurgical Production Association (VSMPO), the world's largest titanium metal producer. AVISMA posted output worth Rb1.87 billion (US\$66 million) in the first nine months of 2000, up 17% year-on-year in current prices. Data on the volume of titanium and magnesium output are not disclosed.

VSMPO, the majority shareholder in the AVISMA titanium sponge plant, plans to buy up the remaining shares of the plant to bring its stake up to 100%. At the end of 2000, the Antitrust Ministry gave it the go-ahead to buy out the remaining shares in the Berezniki-based titanium producer. But the clearance from the ministry allowed VSMPO to legally finalise the acquisition of 70.18% of AVISMA and buy about another 5% of shares from other shareholders. Thus VSMPO now owns about 75% of the plant's shares.

VSMPO increased the value of its output in 2000 by 22.6% to Rb5 billion, but only 7.2% in dollar terms, to US\$178 million. Deliveries were up 31.7% in roubles and 16.2% in dollars, to respectively Rb4.5 billion and US\$164 million. In 2000, titanium accounted for 80.1%, aluminium 10.7%, steel 3.1% and ferrotitanium 5.6% of VSMPO's output. This year, the figures will be 77.7%, 6.3% and

15.9% respectively. VSMPO currently sells 65% to 70% of its output under long-term contracts to major aircraft and aerospace companies such as Boeing, Airbus Industries, General Electric Aircraft Engines and Rolls-Royce. The company plans to export 57.8% of output this year, compared with 61.3% in 2000.

Magnesium

Magnesium is produced in Russia by AVISMA and the Solikamsk Magnesium Plant (SMZ) in the Perm region in the Urals. In 2000, total magnesium production increased by 0.5%.

SMZ produced 17,011 t, up 2.2%, and processed 9,521 t of loparite concentrate (used in production of rare-earth metals), an increase of 15.4%. Magnesium and its alloys accounted for 64.4% and rare-earth metals 34% of total output. SMZ exported 15% of its production to the US, about 2,500 t of magnesium. SMZ exports about 50% of its magnesium and alloys to the European Union and sells 35% domestically.

SMZ is going ahead with plans to raise capacity from 20,000 t to 35,000 t of magnesium. The company is in talks with major automotive companies and auto component manufacturers on investments to upgrade the works. It will take two years to augment capacity by 15,000 t at a cost of about US\$100 million. The costs will be recouped in six to ten years, depending on world prices for magnesium. The works will use new kinds of raw materials like serpentine and brucite to reduce costs. SMZ will be able to increase production of wheel discs through its partnership with an automotive company. These currently account for 10% of total output. In 2000, SMZ doubled wheel disc production to 12,000 t and this year intends to produce 100,000 t.

Russia's output of magnesium is likely to increase in the years ahead. The Sverdlovsk region plans to raise about US\$300 million to build a facility to produce up to 50,000 t of

magnesium per year at the Uralasbest asbestos works, from the city of Asbest. Several millions of tonnes of asbestos ore tailings with average magnesium content of 20-24% have accumulated there and Uralasbest specialists have devised a method to recover the magnesium and have obtained their first metal at an experimental facility. The site has numerous advantages, among them inexpensive raw materials, proximity to the Beloyarsk nuclear power plant, skilled staff and existing but incomplete industrial premises. Full projected capacity for magnesium could be achieved as early as 2005 if the money can be raised. The main potential project participant is thought to be SMZ, which was the first Russian company to come up with a method to recover magnesium from asbestos waste. At present, magnesium is obtained mainly from carnallite.

Cobalt

In September 2000, Ufaleinikel in the Chelyabinsk region commissioned a direct current furnace capable of producing 3,000-4,000 t/y of granulated cobalt. The company built the furnace, which is of strategic importance to its development, on its own.

In the past, Ufaleinikel has only produced cobalt in ingots and other products such as high purity cobaltic oxide. But world demand is greatest for granules or for ingots smaller than those produced at the plant today. The new furnace will make Ufaleinikel one of the world's biggest cobalt producers. World consumption of the metal runs to about 25,000 t annually. Norilsk Nickel will supply the raw cobalt and receive the end product.

Ufaleinikel produces pyrofinned nickel, nickel oxide, ferronickel, metallic cobalt and cobaltic oxide. It has the capacity for 17,000 t of pyrofinned nickel, 1,900 t of cobalt and 5,000 t of ferronickel per year. The company processes ores mined at the Ufalei and Serov deposits in the Sverdlovsk region, matte from the Rezh nickel smelter and nickel scrap.

The other Russia cobalt producer, Yuzhuralnikel, is looking at the possibility of processing cobalt concentrate from Zaire using the hydrometallurgical plant leased to the Yuzhpolimetal subsidiary. It is believed at this stage that the African concentrate is 90%-suitable for processing at the facility. Several years ago, Yuzhuralnikel processed Cuban concentrate. At present, it produces between 4 t and 8 t of cobalt per month as a nickel processing by-product. However the cobalt production is not profitable because of the low cobalt content of the nickel ores of just 0.03%. The concentrate from Zaire would make cobalt production profitable.

Gold

According to the Union of Gold Producers, Russia produced a total of 143 t of gold in 2000, 13.2% more than in 1999 (a figure which included mine output, incidental production and recovery from scrap.) Including illegal output, total annual gold production is likely to be close to 160 t. Actual mine output was up 14.6% over 1999. Profit margins at Russian gold-mining companies last year amounted to 8%, the same as in 1999. Low profits were partly the result of a government decision to impose export duties on precious metals, and ores and concentrates containing them.

Russian commercial banks have become the main source of financing for the gold industry. In 2000, they invested US\$200 million in the form of credits. Russian banks bought 111.647 t of gold from producers in 2000. Russian commercial banks exported 60-70 t of gold last year. The Gokhran (Russia's State Precious Metals and Stones Reserve) in 2000 purchased 25 t of gold for the state reserve.

Mining companies from Magadan region (accounting for about 21% of Russia's gold output), shipped 29.802 t of gold to refineries in 2000, 558 kg or 1.9% more than in 1999, according to adjusted figures. The figure included about 14 t of placer gold, 1.86 t more, and 15.821 t of lode gold, 1.3 t less. As

many as 325 enterprises mine gold under 600 licences in the Magadan region. Omolon Gold Co., Russia's biggest gold producer, mined a tentative 13.14 t of gold at the Kubaka gold mine in the Magadan region in 2000, slightly more than the 13.06 t it achieved in 1999.

Russia's Krasnoyarsk territory produced 17.2 t of gold in 2000, 1.2% less than in 1999. Polyus, the territory's biggest producer, which exploits the Olimpiada gold lode, mined 14.47 t of gold. The second biggest producer, the Priisk Drazhny artel, or brigade of prospectors, produced 0.6 t. Geologists identified new geological reserves of 32 t of C2 gold, 26.6 t of it lode gold and 2.2 t placer gold. However, reserves at placers, which have been under development since 1830, are becoming depleted.

Yakutia produced 17.25 t of gold in 2000, up 24.8% from 1999. The biggest gold producers last year were AldanZoloto with 3.78 t, compared with 2.82 t in 1999; IndigirZoloto with 2 t (1.83 t); the Solotinka artel, with 1.02 t (715 kg); and Nirguyana artel with 1.07 t (950 kg).

Irkutsk region boosted gold production to 16.3 t in 2000. Lenzoloto produced 8.15 t of gold in 2000, compared with 7.0 t in 1999.

Gold-producing companies in the Amur region (Far East) produced 11.86 t of gold in 2000, which is 25.3% more than in 1999. The leading gold producer in the region last year was the Pokrovsky mine, which last year produced 1.6 t of gold. In second place in terms of gold production was the Solovyevsky mine, which produced about 1.2 t of gold.

Russia's Far Eastern Khabarovsk territory last year raised gold production by 33% over the 12.32 t it achieved in 1999. The biggest producer in 2000 was Mnogovershinnoye, with 1.13 t, or 165.5% more than in 1999. The company had idled for a period until the middle of 1999.

Buryatia produced 7.5 t. Buryatzoloto, the biggest gold producer from the Russian internal republic of Buryatia, produced 3.95 t of the metal in 2000, 26.1% more than the 3.14 t achieved in 1999. The company produced 2.2 t at the Holba mine, compared with 2.02 t in 1999, and 1.63 t at the Irokinda mine, compared with 1.03 t. Buryatzoloto also produced 126 kg of gold at the Leninsky Kachei placer.

According to the Union of Russian Gold Producers, this year Russia will produce about 146 t of gold, including mine output, incidental production and recoveries from scrap. Given the existing capacity of mining companies and their plans to introduce new capacity in 2001, it is safe to assume that gold production will be sustained. However, this will also depend on internal factors which are making the gold industry lucrative, and any sharp increases in electricity prices or 'rash' decisions by the government could upset things.

Russia aims to be producing 7-8 t/y of gold by the cost-effective heap-leach method by 2003, compared with about 3.5 t in 2000. This will be achieved once existing heap-leach facilities at the Vorontsovskoye, Pokrovskoye and Samolazovskoye mines have reached full capacity, and by bringing new facilities into use. Between now and 2003, the following deposits will be developed by heap-leaching: Svetlinskoye in the Chelyabinsk region, with reserves of more than 100 t of gold and ore at a grade of 1.5 g/t; Tas-Yuryakh in the Khabarovsk territory; Samsonovskoye in the Krasnoyarsk territory; Chertovo Koryto in the Irkutsk region; Tabornoye in Yakutia; Sinyukhinskoye in Gorny Altai; Lyubavinskoye in the Chita region (proven reserves 4 t, probable reserves 80.8 t at 2.1 g/t); Yuzgazhno-Kirovskoye in Orenburg region (10 g/t) and Murzinskoye in the Altai territory.

Nevyanskaya Mining Co., a joint venture between Russia's Uralelektromed and Canada's Placer Dome, will continue to

prospect for gold at the Nevyanskaya area in the Sverdlovsk region in 2001. The work will consist of geochemical sampling at the most promising sections, and core-drilling to make a more detailed study of geochemical anomalies discovered in 2000. The property covers 180 km² and is thought to contain quartz veins, quartz-gold-sulphide and gold-sulphide ores, plus linear auriferous weathered crust. The Russian Ministry of Natural Resources has said the property contains probable P2 and P3 reserves of 40 t of gold.

The Russian Ministry of Natural Resources will call a tender in 2001 for two major gold lodes - Belaya Gora and Khutorchanskoye - in the Far Eastern Khabarovsk territory. The deposits contain a probable 20 t and 50 t of gold respectively. The ministry will also call a tender for the Malo-Shushenskoye deposit in the Krasnoyarsk territory with 2.5 t of gold, and Kamenskoye in the Orenburg region with 4.2 t of gold.

Two major deposits are thought likely to attract investors if developed under PSA terms: Sukhoi Log (Irkutsk region), and Kyuchus (Yakutia). Sukhoi Log, which is in the Bodaibo district of Irkutsk, had its reserves listed in 1975 as 1,110 t of gold with an average grade of 3 g/t Au. Preliminary exploration indicates that Kyuchus contains more than 155 t of gold with an average grade of 8.7 g/t Au. The deposit, which contains a large amount of sulphide ore, contains relatively little silver (50 t).

The Russian Government also plans to include the Nataika gold deposit (Magadan region) on its list of companies having the right to be utilised under production sharing agreements. Nataika is currently the biggest gold deposit in the gold-rich Magadan region. As of January 1, 2000, its proven reserves were 245.4 t with average grades of 4 g/t. The deposit could contain 720 t of gold of probable reserves. The Matrosov mine has a licence valid until December 31, 2012. Its

quota for gold production this year is 1.2 t. The deposit has yielded 63.8 t of gold so far.

Silver

More than 90% of silver in Russia is currently produced as a byproduct of nonferrous metals production, and almost no silver deposits are being developed. One of the country's biggest producers of by product silver is Norilsk Nickel. Russia's biggest silver-producing regions are the Krasnoyarsk territory, Bashkortostan, Chelyabinsk region, Orenburg region and Primorye territory.

Russia severely curtailed silver production in 2000 by introducing an export duty. Russian silver exports plummeted by just over 84% to 100 t, mainly on account of a 6.5% export duty on silver bullion. The total cost of exported silver went up about 10%, including the 6.5% duty, 3.3% shipping costs and a 0.15% customs fee. Given that silver was difficult to export and that domestic demand is virtually zero, the metal is hardly profitable to produce. Nevertheless, silver producers are expected to go on with their plans to increase output.

Russia has so far only one major, prospected silver deposit - Dukat in Magadan region. Dukat contains a proven 14.3 Mt of ore at an average grade of 655 g/t Ag and 1.39 g/t Au, of which 10.3 Mt average 667 g/t Ag and 1.4 g/t Au. The field contains about 15,000 t of silver and at least 35 t of gold.

Dukat Mining Co., owned by Russia's Polimetall (which owns the Dukatsky GOK assets), and Serebro-Dukat, (owned by Canada's Pan American Silver), agreed in September 2000 to mine the Dukat field on a joint basis. They signed an agreement by which the Russian partner would own 80% of the joint venture's equity and Pan American Silver would receive 20% of the gross earnings without the right to control the company. The Russian partner undertook to finance the development cost.

Polimetall Inter-Regional Scientific Production Association (MNPO) of St Petersburg plans to start mining the Lunnoye silver lode in the Magadan region in September 2001. Lunnoye contains a proven 9.2 Mt at an average grade of 428 g/t Ag and 1.9 g/t Au, or 120 Moz (3,700 t) Ag and 500,000 oz (15.5 t) Au. By July 1, 2001, the company intends to start commissioning a 300,000 t/y capacity mill. By the end of 2001, Lunnoye should yield 123,000 t of ore. Eventually, it will produce 120 t of silver and 800 kg of gold annually. A Magadan firm, Serebro Teritorii which was formed as the result of the reorganisation of the Geolog company, holds the Lunnoye licence. Polimetall owns 75% of the shares in Serebro Territory.

In February 2001, Uralektromed, a major producer of refined gold and copper, completed the first stage of upgrades at its refined silver division, which is now capable of raising annual output for refined silver by 50% to 225 t. Uralektromed started to employ a new casting method. In the past, molten silver was poured straight into cold ingot moulds, but this was detrimental to the quality of the ingots, which fell short of their expected crystallisation level. Now, the silver will be poured into a pre-heated ladle, and then into the moulds, which will have been water-cooled. The moulds have also been redesigned. The new technology can produce srA-1 and srA-2 grade ingots with level, smooth surfaces and weighing a strictly regulated 29.32 kg. Prior to the upgrades, Uralektromed was able to produce 150 t of refined silver per year.

Kolyma Refinery (Magadan region), a major producer of refined gold, will begin producing silver in 2001 and will produce 50 t year. Silver production in 2002 will amount to 180 t and the plant plans to increase silver production to 600 t/y by 2005. Kolyma Refinery currently uses an electrolyser produced by the Irkutsk Precious and Rare Metals and Diamonds Research Institute (Irgiredmet), with a production capacity of 3 kg of silver per hour. Using the Institute's

technology, Irkutsk Aviation Production Association will produce another two electrolyzers by October 2001, at a total cost of about US\$140,000. By 2002, the plant will launch another three units, which will increase their number to six.

Platinum Group Metals

Russia is the world's biggest producer of PGM providing over 70% of the world's palladium, 20% of its platinum and a considerable volume of rhodium.

Norilsk Nickel produces most of Russia's PGMs. The key facility of the group, Norilsk Combine, makes platinum and platinum-group metal concentrates which are refined into bullion at the Krasnoyarsk nonferrous metals plant. Norilsk Nickel produces around 40-60% of the world's PGM. Palladium and rhodium account for around 80% of the company's PGM, and platinum makes up the other 20%. In 2000, Norilsk Nickel received over US\$2.2 billion from PGM in comparison with around US\$1 billion in 1999.

This year, Norilsk Mining Co. (NGK), a subsidiary of Norilsk Nickel, will begin commercial development of tailings dumps which contain large amounts of nickel, copper and PGM. Processing and enrichment of concentrate will take place at the Norilsk Enrichment Plant. Average metal content in tailings dumps reportedly corresponds to, and even slightly exceeds, their content in ores now being mined by NGK. The largest of these deposits is the tailings dump at the Norilsk Enrichment Plant (NOF-1), which built up over 27 years from 1948 to 1975. The dump has up to 2.1 g/t Pt, 5.8 g/t Pd, 0.24 g/t of Rh, 1.4 g/t Au, 0.8 g/t Cu and 0.6 g/t Ni. Tests have shown that tailings can yield concentrate with about 20 kg of platinum group metals per tonne.

Norilsk Nickel intends to step up co-operation with Russian precious metals refineries, entering into joint production or joint ventures with them. Companies to make industrial

compounds, materials, petrochemical and automobile catalysts and jewellery would be set up. Norilsk Nickel and the state-owned Pirotsky nonferrous metals processing plant from the Ryazan region plan to make PGM salts and compounds. The Prioksky plant processes some of Norilsk Nickel's concentrates. Norilsk Nickel is planning joint projects with the Yekaterinburg nonferrous metals processing plant, Russia's biggest producer of PGM manufactures, and with the Supermetall company to make glass-melting vessels.

In December 2000, Norilsk Nickel signed a co-operation agreement with the administration of the Voronezh region in central European Russia. The region and Norilsk Nickel would make a joint effort to study and develop nickel deposits. The Russian Academy of Sciences has said a number of nickel deposits have been explored in the Voronezh region. The biggest of them are Yelkinskoye and Yelanskoye. Much of the Voronezh nickel province has yet to be explored in sufficient detail, though. The region is also home to part of the Kursk-Voronezh platinum province, which the Academy believes to be one of Russia's biggest. Some 100 deposits, occurrences and potential mineralisations of varying size have already been discovered. The ores are known to contain platinum, palladium and gold.

Diamonds

Almazy Rossii-Sakha (ALROSA) accounts for nearly 100% of diamond production in Russia. Alrosa mined US\$1.62 billion in rough diamonds in 2000. The Alrosa Group consists of about 40 enterprises, 11 of them industrial. The biggest diamond-mining enterprises are Alrosa-Nyurba, Almazy Anbara and the Catoca Mining Company Ltd. joint venture in Angola, in which Alrosa owns 32.8% of the shares. The group also includes two construction and two geological outfits, financial institutions and Almasnaya osen, a private pension fund.

Under its five-year production plan, Alrosa intends to export 40% of its rough diamonds and sell 60% domestically. Last year Alrosa supplied rough diamonds worth US\$580 million to cutting plants represented by the Russian Association of Gem Manufacturers, up 25% year-on-year.

Alrosa group plans to sell US\$2.06 billion worth of rough diamonds this year, up 25.7% from 2000, according to plans approved by the company's supervisory board. The plans call for increasing output of rough diamonds to US\$1.84 billion. The board also approved a five-year plan for 2001-2005 that will aim to boost diamond output to US\$1.93 billion annually, and increase sales to US\$2.05 billion including cut diamonds. The Alrosa group is expected to produce US\$8.591 billion in rough diamonds over the five years to 2005 and sell more than US\$9 billion, including cut diamonds.

In November 2000, Alrosa put the Zarnitsa diamond pipe, one of the world's biggest and Russia's second biggest, commercially on stream. Zarnitsa, which is in the Russian republic of Yakutia, will be providing most of Alrosa's diamonds by 2010, when the open-pit operation at the Udachnaya pipe has ended. It will be mined by the Udachninsky GOK, or mining and milling complex, which currently turns out about US\$900 million worth of diamonds - more than 80% of Alrosa's output - per year. Zarnitsa's projected mine-life is more than 20 years (until 2022).

Alrosa's main priority in 2001 will be to develop the raw materials base. Plans include the construction of deep mines at the Mir, Aikhal and Internatsionalnaya diamond pipes, stepping up preparations to mine the Komsomolskaya and Nyurbinskaya pipes, and building new infrastructure, including a gas pipeline to the settlement of Aikhal, where the Aikhalsky GOK mining and milling complex - one of Alrosa's main mining enterprises - is located.

Alrosa at the end of January 2001 commissioned two modules supplied by South Africa's Bateman to recover diamonds from ore at the Aikhalsky GOK, which exploits the Aikhal and Yubileinaya diamond pipes in Yakutia. The units, which are designed to operate in severe conditions will each treat 100 t/h of ore when at full capacity. The Aikhalsky GOK had always used the customary jigs which achieved relatively low recoveries and a high concentrate yield. The Bateman units, though, would be able to process rock 3-6 mm in diameter and recover up to 99% of the diamonds. Alrosa also introduced a Paket-Lift vertical incline conveyor, supplied by Sweden's Svedala, at the GOK. This can shift up to 2,000 t of rock per hour. Tests by Irgiredmet and the Yakutniproalmaz institute have shown that the conveyor subjects diamonds in rock to less potential damage than the pressurised hydrotransport that has been used to date.

Alrosa owns 40% of Severalmaz, the company that holds the licence to develop the big Lomonosov field in the Arkhangelsk region. The Lomonosov diamond field will go commercially on stream in 2005. The Severalmaz supervisory board approved a programme of preparatory measures in 2000-2001 for the construction of a diamond-mining enterprise on the deposit. The construction project is to be over in 2003. The construction of a road to the deposit will be financed by its future users. Lomonosov is thought to contain US\$12 billion worth of diamonds, more than half of which are of gem quality. It will cost something like US\$740 million to put the deposit on stream.

Uranium

At present, the Priargunskoye Mining-Chemicals Association, Russia's only uranium producer, mines the Streltsovskoye ore province in the Trans-Baikal, and produces 2,200-2,500 t/y of uranium. Streltsovskoye has sufficient uranium for 35 years at a sustained extraction rate of 2,000 t/y. However, association specialists believe that the reserves can only be mined profitably

for 10 years or so, and the search is on for new reserves.

The Ministry of Atomic Energy has said Russia produces about 4,500 t/y of uranium and consumes 8,000-8,500 t. The difference is made good from stockpiled uranium. Meanwhile, Russia's uranium stockpiles, which are among the world's biggest, could run dry in 20 years as the nuclear energy sector and exports grow. Russia's stockpiles are equivalent to 500,000 t of low-enriched uranium. This includes 1,400 t of high-enriched, or weapons-grade uranium extracted from nuclear warheads (equivalent to 420,000 t of low-enriched uranium), and 80,000 t of uranium stockpiled from years past.

The Russian R&D Institute for Chemical Technologies expects that Russia will double uranium production to 4,000-4,500 t/y by 2010. Mine output would increase over the next ten years as the new Dolmatovskoye field in the Kurgan region, Malenkovskoye field in the Kemerovo region and Khiagunskoye field in Buryatia go on stream. These three mines between them would produce about 2,000 t/y of uranium.

Coal

Russia's current commercial coal reserves exceed 200,000 Mt, about half of which are bituminous and 38,000 Mt coking coal. Deposits are characterised by complex mining and geological conditions, such as disrupted and flooded seams, a high gas content and risk of explosion, a tendency to self-ignition and a significant share of reserves with inclined seams.

Coal companies in Russia produced 258 Mt of coal in 2000, up 3.4% year-on-year. In 2000 Russia produced 62.2 Mt of coking coal - up 4.2% year-on-year. Russia also increased production of thermal coal, which was up 3.1% to 196 Mt, including hard coal - up 3% to 109 Mt and brown coal - up 3.3% to 86.2 Mt.

In 2000 as a whole, average daily production rose by 9.2% in the Kansk-Achinsk basin and 4.6% in the Kuznetsk basin, but fell 13% in the Moscow basin, 4.2% in the Donets basin, 4.5% in the Pechora basin and 3.5% in the Far East (of which 8.7% is in Primorye).

State support for the coal industry totaled Rb7.97 billion (US\$283 million), or 20.3% less than in 1999. Investments halved in constant prices to Rb132 million. Russia will allocate the coal industry Rb8.5 billion (US\$301 million) from the federal budget in 2001. About Rb2 billion (US\$70 million) will go towards sustaining profitable pits.

In March 2001, the World Bank decided to extend the implementation term for the second coal sector adjustment loan (SECAL-2) until December 31, 2001 at the request of

the Russian Government. The government had made substantive progress in meeting the conditions for disbursement of the second 'privatisation' and the fourth 'social' tranches of SECAL-2, which amount to respectively US\$100 million and US\$50 million, the bank said. In the bank's opinion, between 1998 and 2000 sustainable progress has been made in all the key areas of the coal sector restructuring in Russia.

Oil

The Russian oil industry holds a prominent place in the world economy with proven reserves of 9-12% of total world reserves by various estimates. Russia's extractable oil reserves of around 19,000 Mt (138,100 Mbbl) are spread over 1,900 oil fields, of which only 170 can be classified as major fields (where the bulk of resources are located).

Selected Mineral Production in Russia ('000 t except where specified)					
Commodity	1996	1997	1998	1999	2000
Aluminium					
Alumina	2,150	2,380	2,465	2,687	2,889
Bauxite	3,925	3,988	4,092	4,513	5,000
Metal (smelter, primary)	2,873	2,906	3,010	3,149	3,247
Copper (refined)	599	640	656	737	824
Gold (t) (Au content)	123	123	114	126	143
Iron and Steel					
Iron ore	72,100	70,800	72,300	81,500	86,600
Pig iron	37,100	37,300	34,800	40,100	44,600
Steel	49,300	48,400	43,800	51,500	59,100
Rolled stock	38,900	37,800	34,100	40,900	46,000
Pipe	3,500	3,476	2,842	3,300	4,833
Lead					
Metal	27	47	33	55	52
Tin					
Metal	12	9	4	4	5
Zinc					
Metal	175	190	196	231	241
Coal	257,000	229,182	246,600	249,516	258,000
Gas, natural (million cubic m)	601,000	571,000	591,400	576,400	584,200
Petroleum (crude)	292,918	296,859	293,933	304,994	323,300

Source: State Statistics Committee, Ministry of Trade and Industry, Interfax-M&CN's estimates

Russia produced 323.3 Mt of oil and gas condensate in 2000 according to the Ministry of Energy, which was 18.3 Mt more than planned for the year and 17.9 Mt more than in 1999. Oil deliveries to the domestic market reached 179.3 Mt, 8.8 Mt more than in 1999. Joint ventures operating in Russia produced 19.1 Mt of oil, which was 5.9% of total oil production in Russia. Production under PSAs topped 2.2 Mt (Sakhalin Energy produced 1.7 Mt, and Total Exploration and Development Russia produced more than 515,000 t). Gazprom produced more than 10 Mt of oil last year.

Total financing for geological exploration for oil and gas in Russia by 2003 will increase 21% from 1999, the Ministry of Economic Development has said. This could increase proven oil and gas condensate reserves by 60% and proven natural gas reserves by 100%. The projected increase in proven oil and gas reserves will not be offset by production.

Natural gas

The Russian fuel sector produced 584.2 billion m³ of gas, 7.8 billion m³ less than in the previous year. Gas production by Gazprom companies in 2000 amounted to 523.2 billion m³ against 545.6 billion m³ in 1999.

Gazprom estimates its own gas reserves were 26,600 billion m³ as of January 1, 2001. Reserves for companies with Gazprom participation of over 51% amount to 3,400 billion m³, and amount to 2,200 billion m³ for those companies with Gazprom participation of less than 51%. Analysis has been carried out according to international SEC standards at 84% of gas reserves, 91% of condensate and 71% of oil reserves.

The government forecasts that falling natural gas production in Russia will be reversed within the next three years. A social and economic development prognosis by the Economic Development Ministry says that given the solvent consumer demand on the domestic and CIS markets, gas extraction

could total 618 billion m³, or 4% more than in 1999, and gas export would be 245 billion m³ (20% more). New gas condensate and gas fields are to be tapped within the coming years in Sakhalin, the Tyumen region, and Sakha, and export gas pipelines are to be laid to China, Korea, Mongolia, and Turkey (the Blue Stream project). The implementation of these investment projects will create an incentive for boosting gas extraction.

Others

In 2000, Russia raised amber production slightly after the state-owned Yantarny kombinat in the Kaliningrad region, the world's biggest amber producer, reduced output by 30% to 364.5 t of amber in 1999. Yantarny kombinat has the capacity to produce 1,685 t of amber per year. Kaliningrad, a Russian Baltic exclave, is home to 95% of the world's amber reserves. Yantarny kombinat holds licences to three deposits - Primorskoye, which yielded 42.5 t in 1999, Palmikenskoye (322 t) and Filino, which is not under production.

The Russian-Irish Zelen-Kamen joint venture, which holds a licence to develop the only emerald deposit in Europe, the Malyshevo mine in the Sverdlovsk region, will begin producing emeralds at the beginning of 2001. Zelen-Kamen estimates investment in reconstruction at the pit to cost Rb60 - 70 million. The emerald deposit has projected capacity of 270,000 t/y of emerald-containing ore. In addition, mine tailings containing 280,000 t of emerald ore and reserves will suffice for one year of production. The tailings at the Malyshevo mine have an emerald content of 1.5 g/t.

In October 2000, TVEL, a producer and supplier of nuclear fuel controlled by the Russian Ministry of Atomic Energy, finished building a mining and enrichment plant at the Etynskoye tantalum and niobium deposit in the Chita region. The design capacity is 40 t of tantalum, 60 t of niobium and 100 t of tin per year. TVEL is also building a hydrometallurgical plant in the settlement of

Pervomaisky, Chita region. This will cost Rb213 million (US\$7.6 million), to be recouped in 7.5 years. The anticipated profit margin is 13%.

The Chita region has decided to join a special federal programme, called Libton, to create a scientific-production centre for rare metals lithium, beryllium, niobium and tin, in the Trans-Baikal region in view of the expansion of the industry. The Chita region and TVEL at

the end of 2000 signed an agreement on liaison with the Priargunsky Mining and Chemicals Production Association, a uranium producer controlled by TVEL, and the Zabaikalsky Mining and Benefication Plant, a rare metals producer. The agreement states that the ministry will co-ordinate efforts by the Priargunsky and Zabaikalsky complexes to mine and produce raw and other materials for the nuclear sector, and finance the targeted programme dubbed 'Libton'.