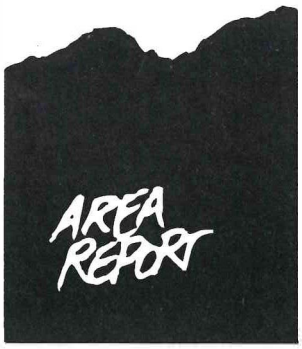

Mineral production in the former Soviet Union

By Dr. Steve Hall

The former Soviet Union, representing one sixth of the global land mass, is rich in mineral resources and its current and future production cannot be ignored by the international metal markets and producing companies. This article highlights some of the recent activities in the major energy and mineral industries.

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The dramatic political change in the former Soviet Union has led to significant effects on the production and export of many mineral and energy commodities. These have led to price instabilities at a time of world recession. The changes are due to many factors, firstly the desire to secure valuable foreign exchange (and in some instances pay debt) at a time when annual inflation is currently over 2 000 per cent, secondly the reduced internal demand by the military and industrial sectors, thirdly the breakdown of trade between the fifteen countries that have resulted from the break-up of the Soviet Union, and finally the ending of heavily subsidised supplies to former eastern bloc nations, such as Eastern Europe and Cuba. Against this producers are faced with difficulties in obtaining supplies, including energy, lack of clarification of responsibility for decision-making, increasing and variable export duties, chronic overmanning and often the need to provide all of the support infrastructure (e.g. schools, hospitals, etc). The previous policy of maximum self-sufficiency in minerals and metals means that while some operations are producing from world-class deposits, others are economically marginal or sub-marginal and their future must be in doubt. For these reasons it is thought that, while exports may remain high, it is unlikely that the large export figures seen in the last two years can be maintained.

Changing legislation has permitted investment by Western countries through the acquisition of exploration and development rights and joint ventures. However, much of this legislation has yet to be finalised or tested. Joint ventures have included financial institutions. The Russian American Investment Bank is a joint venture between a number of Western banks, brokers and insurance groups, and the Russian army pension fund, banks, Gasprom (the gas industry association, which accounted for over 90 per cent of the 640 billion cubic metres of Russian production in 1992) and a number of mineral rich regions. It will focus on natural resources development and the conversion of military enterprises. Internal consortia are forming to successfully bid for contracts against foreign competitors. Higher employment opportunities and retention of profits are seen as positive aspects of these tender submissions.

Oil, Natural Gas and Coal

This region of the world is estimated to contain 40 per cent of remaining unexploited reserves of oil and gas. While many of the reserves are in Russia, a number of the new republics have significant occurrences. Azerbaijan has an old oil industry (the first commercial well started in 1870), and 60 per cent of the country may be oil bearing, however production has fallen from 21.5 Mt in 1965 to 3.7 Mt in 1988. This was partially due to investment being focussed on the newer discoveries in Siberia. Several Western companies have now signed agreements with the new government in Azerbaijan for exploration for both oil and natural gas. One of the major difficulties will be in getting the oil from the country once production commences.

While oil has been, and remains, Russia's biggest export earner. The industry has been run down by decades of under-investment in equipment and by inefficiencies arising from centralised planning. Russian production is expected to have fallen to 400 Mt in 1992, from 505 Mt in 1990. Limited privitisation plans have been decreed, giving foreigners the right to acquire up to 15 per cent of oil companies, but accompanying legislation has made slow progress.

Much of Russian gas production is sent to Western Europe via an extensive pipeline network across the Ukraine and countries in Central and Eastern Europe. These countries recieve transit payments and purchase additional gas supplies; however, many are keen to diversify the source of supply (e.g. from Norway) though investment in the necessary infrastructure is required. Further investment, estimated at between 8 000 and 9 000 MUSD over the next five years, will be needed by Gasprom to maintain Russian production levels. Much of this has already been secured in

The map shows the former Soviet Union, representing one sixth of the global land mass and rich in mineral resources.

foreign bank credits, rather than as joint venture capital. While the aim is to be as self-sufficient as possible, new technology is desired and Gazprom may approach foreign companies for small-scale investment projects. A Russian consortium, "Rosshelf", comprised of 19 companies has been awarded the contract for the development of the world's biggest gas field, against international competition. The Shtokman field contains an estimated 3 000 Mm^3 of gas in the Barents Sea. Many foreign companies are now targeting Kazakhstan and other republics that are opening up to outside investment.

Coal reserves exist in many of the new countries, but with production centred on the three largest. The former Soviet Union has been estimated to contain 22 per cent of the proven 618 000 Mt of world economically recoverable reserves of hard coal. Major reserves of brown coals exist and are exploited. In 1990 coal production estimates are Ukraine (206 Mt), Russia (173 Mt) and Kazakhstan (50 Mt).

Uranium

The nuclear market is faced with a flood of thousands of tonnes of military uranium (and plutonium) following the end of the Cold War. The fall-off in the growth rate of nuclear power has meant that supplies of uranium and plutonium are now outstripping demand. The United States has agreed to reprocess the former Soviet Union's share of the uranium with a promise that this would have no effect upon the commercial market for nuclear material. How this is to be accomplished is unclear and is possibly unattainable.

Diamonds

Most Russian diamonds are mined in the autonomous region of Yakutia in eastern Siberia, and it is the world's premier supplier of gem quality diamonds (accounting for 15 per cent of world diamond production in 1991). De Beers' London-based Central Selling Organisation (CSO), which controls about 80 per cent of world trade in rough (uncut) diamonds, in 1990 signed a USD5 billion, five year sales deal with the former Soviet Union. An important element of this agreement prevents Russia selling more than 5 per cent of production independently. While a large inventory of gem quality diamonds exists in Russia, its release onto the market, to generate desperately needed foreign exchange, could seriously that market. Rumours of unofficial exports are already contributing to market turmoil. Russia has been pressing for special privileges at a time when De Beers are trying to impose quotas on producers allowing the CSO to buy 25 per cent less from all its suppliers.

Precious and Base Metals

Deliveries of primary platinum as exports from the former USSR in 1991 totalled over one million ounces. Most of the region's platinum group metals (platinum, palladium, rhodium, and others) are produced in Russia, with at least 95 per cent of this output being provided by Norilsk Nickel. Here they arise as a by-product of copper-nickel production from the six mines of the Norilsk-Talnakh complex. Ore and concentrates are smelted both at Norilsk and at Pechenga on the Kola peninsula. The smelters at both sites emit over 2 Mt of sulphur dioxide annually and the operating company is under increasing national and international pressure to improve its environmental performance. A Scandavian-funded study has led to the proposal for a 600–800 MUSD investment to provide environmentally-friendlier modern smelting technology, however, progress is stalled while sources of funding are identified. Again exchange of impure metal or concentrates has been proposed.

With Russia accounting for 20 per cent of world platinum output and South Africa 75 per cent, there have been concerns raised that the developments in technical collaboration, between the two countries, could lead to market-rigging deals. While there is no evidence of this, the combined market share of the two countries in a number of mineral commodities is overwhelming (Table 1).

The fears of the effect that the disposal of a large inventory of gold, held by the Soviet Union, might have had on the price have been shown unfounded. Gold production has been and continues to be significant, with major alluvial gold production in Siberia. Detailed information is still difficult to come by as gold-related activities remain a state secret. The Muruntau deposit in Uzbekistan is a truely world class deposit, producing 1.8 million ounces per year. Reserves are good for at least 50 more years and the original deposit is estimated to have contained over 140 million ounces. The milling facility is over one kilometre long using resin-in-pulp technology. This is the norm for cyanide leaching-based gold production, rather than the activated carbon technologies favoured in Western countries. Newmont Mining, North America's biggest gold producer, with a funding arrangement that includes a syndicate of European banks, has proposed the use of heap leach technology to extract further gold from low grade ore stockpiled at Muruntau. Here the joint venturers have agreed to follow Swedish law as Uzbekistan has no mining laws of its own.

Foreign companies have become involved in gold production activities. A small Australian company, Star Technology Systems, in a joint venture with a local company, has attempted to develop the large hard rock gold deposit, Sukhoi Log in Siberia. However, legislation has led to the tender submissions being limited to Russian-only groups. The decision is likely to be challenged, thereby testing some of the formulative legislation.

Copper smelters in Russia and Kazakhstan influenced the supply and demand picture in the market during 1992 by treating about 300 000 t of Western copper concentrates. The resulting production increase of more than 100 000 t prevented a projected supply deficit. However, this year it may no longer prove economic to undertake such toll smelting. In the longer term primary copper production should increase, with the contract for the development of the Udokan copper deposit in the Chita region of Siberia awarded early in 1993. This deposit, discovered almost half a century ago and one of the largest in the world, is thought to contain 18 Mt of copper. The project is highly complex and is thought likely to require foreign participation. The international tender for the 1 000 MUSD project has been won by a Russian dominated group, with Western project management and finance. Projected sales of copper concentrates include a 25 year deal to sell 200 000 t/year to China.

A sudden surge of aluminium exports from the former Soviet Union has been blamed for driving down aluminium prices to their lowest ever level in real terms in 1992. This at a time when Western producers are faced with rising costs and environmental pressures. Many smelters in the former Soviet Union are old and inefficient by Western standards. A Western smelter might emit 25 times less fluorine than one in the former Soviet Union in producing each tonne of aluminium. It is unlikely that the export levels of over 1 Mt in 1991 can be maintained as some smelters have reportedly been shut down due to the lack of supplies of alumina, the imported source material, and civil unrest (i.e. Tajikistan). However, the aluminium industry in the European Community countries has called for import quotas to be imposed.

Table 1
Share of mineral production of the former Soviet Union (percentage of estimated world output, 1991)

Manganese	33
Chromite	29*
Vanadium	27*
Platinum	20*
Diamonds	15
Gold	11

Note: * Together with South Africa accounts for two-thirds or more of total world output.

Conclusions

While it remains difficult to predict future levels of mineral and energy production from the region, some observations can be made. The breakdown of transport and communication infrastructure and trade between the new republics will severely hamper producing enterprises. The creation and development of new supportive financial and legal systems will take time. However, many Western companies are well placed to benefit from ventures in the region, if satisfactory legislative and property ownership procedures can be established. The benefits to the new countries in investment, technology, management, accounting practices and training are needed in all spheres of industry. Hopefully, in the medium term, consumer demand will return and the internal consumption of mineral commodities increase. Production, export and inventory data will become available and more accurate, thus removing some of the uncertainties from the marketplace. What is not in doubt is that the size and geological diversity of the region mean that it cannot be ignored.

Sources: Financial Times, The Economist, The Engineer, Johnson Matthey, Platinum 1992: Mining Journal, Mining Magazine, Dissertation, R Buchanan, *The Energy Minerals of the USSR*, University of Nottingham, 1992, Personal Communication, M. Kaufmann (Consulting Geologist, Spokane, U. S. A.) 1992. ■