

Environment and Security on the Kola Peninsula

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INTRODUCTION

Western visitors to Russia usually paint a very gloomy picture of ecological disaster facing industrial areas and big cities.* Domestic environmental data, which are now readily available, further aggravate this picture.

The Kola Peninsula, or the Murmansk region, fits well into this gloomy picture. Its remote location and its non-diversified industrial sector are factors that drastically complicate any scheme for improving the situation. Industrial mining sites like Nikel and Monchegorsk occupy vast areas of completely destroyed vegetation and soils. Despite the growing environmental concern, expressed by politicians and ordinary citizens all over the North Calotte (including Russia), the situation has not changed for the better. For more than five years, both Scandinavians and Russians have fought for the improvement of the environment on the Kola Peninsula. In the new, favourable political climate — generally attributed to Gorbachev's perestroika policy — increased information exchange has made people aware of the dangers threatening the future development in the area. However, being aware of a problem does not automatically mean that good solutions can easily be found.

In this chapter we focus on public environmental awareness and activity in relation to other problems that people are having to cope with during the current transition period in Russia.

We also discuss how environmental and security issues are connected and we speculate about the prospects of improving the environmental situation in Europe's North — since January 1993 officially labelled *The Barents Sea Euro-Arctic Region* — in a concerted effort with broad Scandinavian participation.

ENVIRONMENTAL PROTECTION AS A NEW POLITICAL ISSUE IN RUSSIA

Despite the current economic crisis, Russians are becoming increasingly aware of the environmental problems facing the country. This has clearly been shown by various public opinion polls. The Chernobyl accident in 1986 also had repercussions in the European North and served as an alarm clock forcing people to pay more attention to environmental issues. On the Kola Peninsula, people nowadays almost unanimously demand that nuclear tests in Novaya Zemlya should be stopped immediately, that nuclear waste from military and civilian activities should not be sunk in the Barents Sea threatening fishing and oil exploitation, and that the heavy industrial pollution in places like Nikel and Monchegorsk should be stopped.

Meanwhile, the ecological situation in the Russian North is continuously deteriorating. Cities become more polluted, primarily due to increased mining activities with obsolete technology. A total of 800,000 tons of hazardous substances are discharged into the atmosphere each year. About 80 per cent of that total consists of sulphurous gases. Over 410 million cubic metres of industrial and household effluents, 60 per cent of which are non-purified, are annually discharged into the water reservoirs in the region. The annual volume of solid wastes from mining activities is 55 million tons (Doiban, Pretes and Sekarev, 1992, p. 10). The Barents Sea fish stocks have been undermined through violations of fishing regulations and excessive fishing. And it is difficult to make even a rough estimate of the pollution caused by the powerful naval complex that is beyond the control of any environmental authority.

Since 1980, the Kola nickel and copper mining companies

have been using ores from Norilsk with a very high sulphur content (28%) resulting in extremely high sulphur pollution levels. Although sulphur dioxide emissions have been moderately decreased in recent years, pollution levels in the Kola mining areas still greatly exceed what is considered harmless for human health.

In the town of Nickel on the Norwegian border, where a big nickel processing plant is situated, 90 per cent of the children are affected by poisonous sulphur dioxide gases in the air. Monchegorsk, another town dominated by the mining industry, is surrounded by an “ecological desert” covering approximately 300 square kilometres. Occasional emissions of very high sulphur dioxide concentrations further aggravate the damage and can be felt in the neighbouring regions of Norway and Finland.

Even if all industrial activities were discontinued at this moment, the sulphur content in the soil would make cultivation impossible for another 100 years. The apatite and nepheline processing plants in Kirovsk and Apatity are surrounded by large areas of waste material. This waste increases in volume by 180 million cubic metres annually. The huge military sector in the₂ area disposes of its nuclear waste both on land and in water.

With the collapse of the Soviet Union the top priority of the Russian government was to stay in power. Foremost among the means to achieve this goal were a stabilization of the domestic currency and the promotion of economic reforms so that the country would eventually be able to recover from its long period of economic inefficiency. The challenges that this government had to meet were formidable. It had to launch reforms of almost everything. Fiscal, structural, social, international and ecological issues all had to be tackled simultaneously. Not surprisingly, the situation in Russia is still in permanent turmoil. Economic recovery in Russia might not come for a long time yet. Some experts believe that it will₃ take until the year 2,000 to get the country on its feet again. In this situation it should be no surprise that environmental concerns will not reach the top of the government’s agenda.

In an effort to come to grips with the deteriorating environmental situation, the former Soviet government set up the All-Union Committee for the Protection of the Environment (*Goskompriroda*), now changed into the Russian Ministry of Ecology and Natural Resources. However, the resources assigned to this ministry have been utterly insufficient for implementing all measures that should be taken to protect and improve the environment.

What industrial enterprises may and may not do to the environment is strictly regulated by law, formerly by USSR legislation and now by laws newly adopted by the Russian Federation. However, these environmental laws could hardly be described as precise and clear. There is, for instance, no law that sets the rates of fines for pollution caused by industrial firms. These fines are instead decided each year by the Russian government. The law only specifies a number of rules that the enterprises should observe. Moreover, the control of these laws and regulations is rather weak and enterprise directors often find it easier to pay the fines for violating the rules rather than solving the problems.

In the current situation, with galloping inflation and serious distortions in the distribution system, enterprise managers are kept busy with trying to procure enough cash to pay their workers' salaries and finding necessary inputs and organising their delivery at reasonable prices. The domestic wholesale market (and, for that matter, also the retail market) is in deep turmoil, primarily because of the weak rouble. This leaves enterprises with very few, if any, options to bargain for the products they need. Therefore, they tend to stick with their old suppliers, which were assigned to them by the former Gosplan or by the relevant sector department of the CPSU Central Committee. For the Severonikel combine, for instance, there used to be no alternative at all other than to get the ore to be processed from Norilsk. This situation is often referred to as a Soviet-type monopoly. Currently, when party discipline and coercion from the centre can no longer determine economic behaviour, there is nothing laying down that existing business

relations should be maintained. On the other hand, there are no new motives and incentives that would make the enterprises look for new partners. Severonikel, therefore, continues to process the Norilsk ore, simply because otherwise it would not obtain any ores to process.

Enterprises in other sectors of the economy or in other regions may, of course, be much more flexible in restructuring and reorganizing their production, since they may not be so dependent on raw material deposits. But the weak rouble presents a problem also to them as well. The newly started commodity exchanges (*birzhi*) offer some deficit goods, but at very high prices that enterprises often cannot afford.

Problems like these occupy much of managers' time and prevent them from engaging in the somewhat longer-term investigation of how to decrease the level of environmental damage caused by the production process in their enterprises.

Many people nowadays believe that the only remedy to the current situation lies in a change of property rights. Private interest, it is claimed, in combination with well-targeted governmental support, would lead to a new situation in which preserved natural resources would be considered as a basic prerequisite for economic efficiency (Smith, 1992, pp. 30–33). In practice, such changes, at the scale of the whole Russian economy, would probably be very difficult to achieve. The amount of "privatizable" property is considerable in the Murmansk region alone. One can hardly imagine that the Russian government will let the resources of the Murmansk region fall into someone else's possession, since these resources are claimed to be of strategic importance to the national economy. Furthermore, no form of mixed ownership has yet been discussed that might also allow broad foreign investment with the goal of creating a process of sustainable economic and ecological development in the Russian North.

In summary, it seems obvious that only a very strong environmental lobby will be able to force political decision-makers to take efficient measures against environmental degradation. This lobby must be based on broad popular support for the

activities of environmental organizations, governmental as well as non-governmental. The grave ecological developments have increased popular support for these movements, although one should remember that people's concern for the environment might not immediately make them more environmentally active. The continuous struggle for necessary every-day products and food keeps people busy. Under these circumstances it should come as no surprise that people still pay very little attention to whether or not the goods they consume were produced from environmentally harmful components or through environmentally harmful processes. Facts like these must be borne in mind when trying to foresee future economic and environmental developments. In this critical situation international support for the Russian environmental movement will play a very important role.

ENVIRONMENTAL PROBLEMS AS A THREAT TO ARCTIC SECURITY

Developments on the Kola Peninsula are of crucial significance for security in the whole Arctic region. The region's military importance was established during the years of the cold war. Despite the end of the cold war, Russia, having inherited the military forces from the former Soviet Union, will no doubt continue to maintain most of its huge military forces on the Kola Peninsula. The Northern Fleet, based in Severomorsk near Murmansk, has 220 surface ships and 203 submarines, or 57% of the total Russian submarines and 52% of its nuclear missile submarines.⁷ The Kola Peninsula is said to contain the world's largest concentration of nuclear weapons. About 200,000 people (or 16.6% of the total population in the region or 36.5 % of its total labour force) are employed by the Kola military complex (Castberg, 1992, p. 23).

The strategic significance of the Kola Peninsula cannot be expected to decrease at a rate equal to the on-going reduction of strategic nuclear arms. Although the Arctic has been a region of comparatively low tension in the post war period, the

necessity to maintain a strategic balance will define the region's geopolitical role also in the foreseeable future.

However, despite its great strategic significance, the North remains *peripheral*, first of all, of course, in a geographical sense, but also — and more importantly — in the sense of being poorly integrated into international political, economic and information networks. There are many reasons for this backwardness, one of the most important being the underdeveloped communications infrastructure with (still) only a few East–West links. Another reason might be the traditional Russian reluctance to engage in broader international co-operation.

Today, there are many unsolved problems that together constitute a good argument for making the North a region of peaceful co-operation rather than the potential scene of conflict that it used to be. The changing geopolitical situation and the new formula for East–West relations, the strong environmental concern in all the Nordic countries, the threat of economic collapse in Russia and the CIS, the long-standing regional development problems in the North are all problems of international significance that require serious consideration and subsequent action.

Russia's contributions towards peaceful co-operation in the North are closely related to the success of the on-going economic reform process in the country. One of the ultimate objectives of this reform process is to open the previously closed economy to international competition by making the rouble convertible and removing import and export restrictions. This process will, it is hoped, provide consumer goods, further the introduction of foreign technology, restore the function of the price mechanism as the basic information system in the economy and counteract the monopolistic tendencies in the Russian economy.

Notwithstanding the fundamental changes in the global political climate that have occurred since Gorbachev set out on a new political course in the former USSR, no really profound shift in international security policy can yet be observed.⁸ Despite the fact that considerable reductions of the armed forces

have taken place over the last few years, the implicit “World Military Doctrine” still basically seems to maintain the old image of the two military superpowers opposing each other.

Some changes in certain aspects can, however, be noted. While national and international security today also occupies a leading position in the Western list of political values, security is now generally considered to presume guarantees for human rights and democracy, as well as the necessity of maintaining a process of sustainable environmental and economic development. Thus, clearly, security policy today must consider not only military but also socio-economic and environmental issues.

Murmansk has always been one of the key regions in the Soviet, and now the Russian, security infrastructure. The balance of power in the Arctic has not changed noticeably in recent years, although Gorbachev’s well-known “Murmansk initiatives” of 1987 gave rise to speculation about the withdrawal of nuclear arms from the region. Later developments in the former “Soviet bloc” have emphasized the necessity to re-think and strengthen the Nordic security system, the more so as the USSR in the years following Gorbachev’s speech did almost nothing to implement his ideas of Arctic disarmament. As the late Johan Holst, former Norwegian Minister of Defence and Minister of Foreign Affairs, observed, the process of change which the USSR and subsequently Russia is going through has made Western defence planning focus on *uncertainty* and how to deal with that (Holst, 1991, p. 23–35). The existing balance of power in the Arctic still constitutes a guarantee of international security — a “security” based on the old doctrine of nuclear deterrence.

The development towards a new world order, in which tensions between East and West eventually might disappear altogether, has put disarmament issues on the international political agenda in a way that was unthinkable a few years ago. At present, however, the Russian economy is too weak and disorganized to accomplish a speedy disarmament and conversion of the military sector. Military activities in the Russian North

will therefore continue for a long time yet, causing a permanent threat to the environment. Furthermore, should the disarmament process also touch upon the nuclear arsenal on the Kola Peninsula, the already existing problem of burying nuclear fuel wastes would sharpen and even increase the risk of accidents.

As long as international security issues are assigned top priority in the North, economic collaboration will be allowed only if it does not interfere with the demands of the military. In practice, business collaboration can be established only with the (quiet) consent of the military. There are no signs so far of an influence working in the other direction, i.e. that economic collaboration exerts an influence on the military in the Russian North.

However, coping with environmental problems may well require another approach. Signs of such a different approach can perhaps be witnessed today when the disposal of nuclear wastes raises political tensions between Russia and the Nordic countries. In general, one can conclude that a damaged environment sometimes may require joint projects involving actors from several nations. Such joint undertakings may lead to a closer relationship which could also favourably affect international security, e.g. through an improvement of communication networks. Thus, people's environmental concerns may eventually have a greater influence on the military balance of power than any statements and recommendations made by security analysts and military policymakers. The general sentiment among such analysts is, however, that co-operation in the Arctic area concerning, for instance, environmental protection, scientific projects or natural resource development, is heavily dependent on progress in the security dialogue between the superpowers (Huldt, 1988, p. 327). It seems quite plausible, however, that the environmental issues may influence, directly and substantially, the very course of this dialogue. The current Nordic security concept, defined within the framework of the global balance of power, might, in fact, require environmental amendments in the near future.

In other words, throughout Russia the wide recognition of the “ecological imperative” with its clear economic implications, has brought public attention to issues of strategic security and the future development of nuclear armament. Like the Kola Peninsula, several other Russian regions suffer intensely from the presence of the military. This is first of all the case with the Far-East region, where a large nuclear submarine base is located, and also some regions west of the Urals where intensive nuclear fuel and armaments production takes place. In order to improve the environment in these regions, although the political prerequisites are at hand, the country must overcome its acute crisis and begin its economic recovery.

The restructuring of the military-industrial complex and concrete projects for its conversion to civilian production are vitally interesting fields for international co-operation. Russia will not be able to accomplish such changes on its own accord. There are, in fact, recent signs of increasing international engagement in the Russian economy. Many countries in the West have promised financial support for what has come to be known as the Russian “military conversion programme”. In September 1993, ABB — the ASEA Brown Boveri group — was the first Western firm to announce the purchase of a Russian company belonging to the military-industrial complex.

ENVIRONMENTAL PROTECTION IN THE RUSSIAN NORTH

The disintegration of the USSR drastically affected the prospects for environmental protection. Different agreements and plans concerning environmental improvements had been launched by the former USSR governments and ministries. Let us look at, for instance, the all-union Ministry of Metallurgy, to which the major mining combines used to belong. Today, there are no all-union governing bodies any longer and there has been no automatic transfer of their powers and authorities to the new Russian administrative bodies. To take an example from the Kola Peninsula, the two nickel processing combines, together with two technologically tied-up factories on the pen-

insula, and the basic ore supplier, the Norilsk mining combine, started a consortium — “Norilskii Nikel” — claiming independence from the central authorities and running the enormous industry all on its own. *Presumably*, the environmental protection programmes for the industry also fall within the realm of what the consortium has to determine and, *presumably*, these questions will be handled in close co-operation with the regional authorities. But all this remains to be seen.

For the regional authorities not much has changed. There was a change in the centre so that many regional authorities became subordinated to another central organization. But as rights and responsibilities are concerned very little has changed. The situation is, however, slightly different in what were earlier “autonomous republics”, now simply “republics”, like Karelia and Yakutia, which enjoy more power. It can be noted that Yeltsin has constantly repeated that every region (*oblast'*) in Russia may independently determine their own economic policy to the extent the region can afford. Certain regions, like St. Petersburg, Kaliningrad *oblast'* and the Island of Sakhalin, promptly declared themselves “free economic zones”. In the case of Nakhodka this status was approved by the Russian parliament. However, in most cases these regions only declared their economic freedom without really working out what it meant in practice.

In the Murmansk region there were some attempts — never discussed in detail in Moscow — to follow this development. The case of the Kola Peninsula is different since the economy is dependent upon mineral resources of strategic importance for the whole nation. Still, it should be possible to find alternative solutions that could also suit such regions, and local experts have not given up their efforts at working out a special status for the Kola Peninsula.

There are also other obstacles to economic development in the Murmansk region. So, for instance, the idea of territorial self-organization has never really been acknowledged. Such self-organization would not necessarily imply a complete autarky or that all ties with the metropolitan regions would be cut

off, but it does require the establishment of an insight into the real potential of the region in terms of economic, social and environmental assets and competence. On such a basis it would be possible to develop links with other regions both in Russia and abroad. The experiences gained in Canada and Alaska from the use of so-called "trust funds" might also be valuable for the development of the Kola region (Pretes and Robinson, 1990, pp. 115–20).

International initiatives to stimulate and help with the implementation of environmental protection measures in the Murmansk region have been difficult to realize in the chaotic situation prevailing since the overthrow of the union. The "Eastern partner" in many cases simply ceased to exist and the foreign companies involved seem confused, to put it mildly, as to whom they should now address themselves, with whom to continue collaboration.

Despite the uncertainty, the regional authorities in Murmansk have drafted a programme for the protection of the environment in the region. The environmental issues were examined by the Murmansk Regional Soviet in November 1989. Since no decisions were taken the question was brought up again at a Regional Soviet meeting in October 1991 in an attempt to formulate a programme for improving the ecological situation in the region. However, the programme was never finally approved (*Polyarnaya Pravda*, Oct. 2, 1991). The following goals were envisaged in the programme: An ecological information system should be created and annual reports on the status of the environment should be produced, an ecological education system should be set up and a popular socio-ecological movement must be developed. To reach these goals a sharpening of the penalties for polluting and an introduction of a tax on the production of environmentally hazardous goods could be expected as well as improved environmental assessments. Apart from these more or less general goals, a number of measures of a more immediate and concrete nature were listed, such as the increase of the current utilization efficiency level for sulphur in metallurgical production to 80 per cent by

the end of 1996, to increase the number of waste water treatment facilities in Murmansk, Apatity, Kirovsk, Monchegorsk and Nikel within the next two years and to forbid the usage of agricultural lands for industrial construction (*Sovetskii Murman*, 3 October 1991). The total cost of these environmental measures has been estimated to be some 20 billion roubles (calculated at 1991 domestic wholesale prices). Of course, all such rouble estimations are of a very limited value in the current situation with rocketing prices and inflation estimated at 2,500 per cent for 1992 (December 1992 compared with December 1991) (DIW, 1993, p. 216).

One of the few practical changes concerning the environmental problems in the region is that detailed information about the ecological situation has now become freely available. However, the Russian data do not always correspond to data obtained by the Nordic countries through satellite monitoring.⁹ A free exchange of ecological information is a significant step in the right direction towards further scientific collaboration. Although Russia, and especially the northern parts of Russia, is very poorly integrated into the European information networks, the last few years have seen a drastic growth of information exchange and joint business activities between the Nordic countries and Russia. The Russian border, previously almost completely impossible to penetrate, is now being opened to an increasing exchange of information, commodities and people. Physically, however, the connecting infrastructure has undergone only minor changes, a fact that probably constitutes the most severe restriction on a further development of the interaction between Russia and her Nordic neighbours. It can be noted, however, that measures have been taken during the last year and a half to start improving the infrastructure links between north-west Russia and the Scandinavian countries. Roads crossing the Russian-Norwegian and the Russian-Finnish border are being improved, new border crossings are being opened, and telecommunications hardware is being expanded.

THE KOLA ENVIRONMENTAL DISASTER

The Murmansk regional authorities are hoping for considerable assistance from their Nordic neighbours in their efforts to cope with the existing environmental problems in the region. In the above mentioned environmental programme it is envisaged that obsolete, environmentally harmful technology currently in use in the region should be modernized with the help of foreign companies. Environmental education, especially of young people, should be expanded on the basis of Scandinavian experience.

An intensive international co-operation programme was initiated to lower the extremely high pollution levels from the Pechenganikel Combine, which severely affect the adjacent regions in Norway and Finland. The Norwegian and Finnish governments granted 50 million US dollars each to install sulphur-dioxide reducing technology at the Nikel-Zapolyarnyi nickel ore processing plants (Skorve, 1991, p. 123).

The economic arrangements to finance this enormous project were, however, never finalized, first because of a dispute over which cleaning technology should be used — the Russian “Vaniukov” or the Finnish “Outokumpu” (which was eventually chosen) — and later because of the domestic economic and political problems prevailing in Russia.

So far, in fact, neither the regional government in Murmansk nor the Pechenganikel administration have seen any money. At present, the Russian side cannot afford the proposed terms of this credit, with an interest rate amounting to 12 per cent annually. In the negotiations it was also stipulated that the equipment should be partially paid for by deliveries of refined nickel, valued at drastically reduced prices.¹⁰

No agreement has yet been reached in these negotiations. Meanwhile, the pollution continues to damage not only Russian territories but also parts of Norway and Finland. Quite obviously, new approaches based on more tolerance and understanding are badly needed in order to pull the negotiation out of its deadlock.

This example is probably typical of present-day Western co-operation with Russia, especially concerning large-scale projects. The high risks involved hamper Western assistance, but, at the same time, this increases the environmental hazards. To avoid big risks perhaps it would be wise to try smaller joint undertakings. To make this possible the Russian regional government must be given the authority to interact with foreign partners without any interference from the centre. Such authority has not been granted to the Murmansk regional government. The central Russian government seems willing to provide all regions with broader powers in their international relations. But, in fact, this might mean just a shift from “you must not” to “you may” or even “we don’t care”. In practice, most regions can hardly exercise this freedom, since they are not in a financial situation that allows them to act with any flexibility. Besides, in the present Russian legislation on local and regional administration, that was adopted by the Parliament on March 5, 1992, independent international negotiations are not even mentioned as something included in the competence of the regions (Vedomosti ..., 1992b, pp. 866–897).

The political representatives of the region have been negotiating with the central government in Moscow with the aim of getting a free hand to dispose of 10 per cent of the region’s industrial production volume. As the estimates run, this share is worth some 300 million US dollars annually (Evdokimov, 1992). This figure may, of course, be exaggerated, but not necessarily to a great extent, since major products processed in the region, especially non-ferrous metals, are successfully exported outside the country.¹¹

The outcome of the Murmansk-Moscow negotiations is not yet clear, but there are good reasons for harbouring positive expectations. With this share of exports available for regional needs, the region could, no doubt, back up most of the international projects aimed at improving the environmental situation on its own, and it might also improve and expand its economic infrastructure thus facilitating the integration of the region into the Nordic and European networks.

NOTES

- * This paper was drafted when Dr. Sekarev was visiting the Centre for Regional Science (CERUM), University of Umeå, in May 1992. Financial support for the visit was provided by the Swedish Institute, Stockholm, which is gratefully acknowledged. Some preliminary considerations, on which this paper is based, were presented to the conference “Environment and Security” organized by the University of Umeå, Sweden, May 7–8, 1992. In the course of the conference, a number of thought-provoking ideas were expressed, that in fact have stimulated the completion of the paper. The authors would like to thank Professor Gunhild Beckman from the organizing committee and Dr. Ulf Wiberg, the director of CERUM, who have made every effort to assist us in this work. Special thanks also go to Elena Bashmakova, economic analyst at the Institute of Economic Studies, Kola Science Centre, Apatity, Russia, who has provided valuable information and made inspiring remarks on the subject.
- 1 A public opinion survey on environmental problems was carried out in 1991 by the Murmansk *Grazhdanskaya Initsiativa* (civic initiative) club. The results of the survey were kindly put at our disposal by Dr. Oleg A. Andreev, the club’s chairman.
 - 2 For more information and precise data on the environmental disaster on the Kola Peninsula see: *EKONORD Magasin* (1992–93) and Skorve (1991), pp. 116–125.
 - 3 Oral information from leading German analysts at a workshop on Russian-Ukrainian relations held at Friedrich Ebert Foundation in Bonn on April 27–28, 1992.
 - 4 “Law on the Protection of the Environment” adopted by the Parliament on December 19, 1991 in *Vedomosti..* (1992a), pp. 592–631; the Russian government’s Decree No. 13 of January 9, 1991, “On the norms of industrial pollution fines” in *Sobraniie...* (1991), pp. 242–267.
 - 5 This situation was discussed by the Severonikel’ director, Mr. V. Khudiakov, in an article in *Ekonomika i zhizn*, 1992.
 - 6 According to a recent interview in the Swedish daily newspaper *Dagens Nyheter* (3 October 1993) with Anatoly Chubais, the Russian minister in charge of the privatisation of state property, as much as 60 per cent of all small enterprises in the retail trade (or 65,000 enterprises) have been privatized. The remaining 40 per

cent of the enterprises will be privatized within a year. Of the 20,000 municipal and state companies about 1/3 have gone through the first stage on the road to privatisation — they have been corporatized. Of these 7,000 companies, some 4,000 have also gone through the second stage and become privatized through auction sales. Chubais claims that all companies in Russia will have been privatized by the end of 1994.

- 7 For more information about the military presence on the Kola Peninsula, see Bergesen and Oestreg (1987), p. 63; Jalonen (1988), p. 173.
- 8 Cf. Lena Jonson's contribution to this volume.
- 9 NORUT, the corporation for applied research at the University of Tromsø in Norway, makes intensive use of satellite remote sensing, combined with observations from several cooperating Norwegian research institutes, to monitor the environmental situation in the Murmansk region. Particular attention is given to naval installations and to pollution in the border area. See Skorve (1991), p. 123.
- 10 The domestic price for refined nickel was approx. 1,500 roubles per ton in 1991, whereas the world market price approached 1,600 US dollars per ton. The Norwegians and the Finns were, in fact, bargaining for the SUR prices prevailing at the time, and evaluated at the (no longer valid) "commercial" exchange rate of 1 US dollar=1.8 SUR. With one dollar officially exchanged for 1,200 roubles in the autumn of 1993 this was, of course, unacceptable for the Russians. Domestic prices are now gradually adjusted to those prevailing on the world market.
- 11 The refined nickel export volume from the Murmansk region grew by 50 per cent in 1991 compared to the previous year, according to official data released by the regional statistics service.

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