

# **Russia's Mineral Resources: Reconfiguration of Institutional Framework**

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December 2002



## **International Conference on Natural Assets**

8-11 January, 2003  
Tagaytay City, The Philippines

*Political Economy Research Institute and  
Centre for Science and the Environment*

**CONFERENCE PAPER SERIES**

**Russia's Mineral Resources:  
Reconfiguration of Institutional Framework**

**DRAFT**

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*'Our country is large and rich: only the order is missing here'*  
*Old Russian Proverb*

## **Introduction**

During recent years an intricate, somewhat a paradoxical situation emerged in the Russian Federation (RF) regarding rights to mineral resources. In attempting to solve the problem generated by the non-rational mineral resources management system inherited from the Soviet regime, the RF has changed the institutional structure radically and abolished the monopoly of the state over the access to minerals. Although this transition solved some former problems, at the same time new ones emerged. The government is now attempting to address these new problems within the current round of economic and political reforms initiated by the newly elected President, Vladimir Putin. This paper focuses on Russia's mineral resources – a topic that is of central importance for the current development of the RF – and analyzes changes in the institutional frameworks that regulate property rights over Russia's subsurface wealth.

## **An Assessment of Russia's Mineral Reserves**

Minerals, land, water, forests, biological, and recreational natural resources play an extremely important role in Russia's national wealth. Value assessments of exhaustible natural assets vary according to the assessment methods used. According to the estimate of the RF State Statistical Committee, for 1999 through 2000, natural resources amounted to 95.7% of all of Russia's national wealth (see Table 1). Available estimates also indicate the dominant role of mineral resources in total domestic natural resources.

**Table 1. Estimation of National Wealth of Russia**

<i>Elements of national wealth</i>	<i>Rubles (in trillion)</i>	<i>Percentage</i>
Fixed capital	15.5	3.6
Circulating capital	0.9	0.2
Private household assets	0.9	0.2
Natural resources	412.8	95.7
Non-material assets	1.0	0.3
<b>Total</b>	<b>431.4</b>	<b>100.0</b>

Source: Russian Statistical Annual (2000).

The definition of 'mineral resources' used in Russia differs slightly from the terminology most widely accepted in world literature. According to the 1992 Federal Law on Subsurface, the 'subsurface' is a part of the earth's crust located under the layer of soil, under the bottom of water-bodies, and extending down to the furthest point where geological research and exploitation is possible using current technologies. Mineral resources are any component of the subsurface – in the form of solid, liquid, or gaseous matter – that could be extracted for industrial

use, including not only minerals, but also ores, oil, and natural gas. Reserves of mineral resources are concentrated in the earth's subsurface.

The minerals raw material base is composed of both explored reserves, and reserves that have only been preliminarily estimated. 'Explored' mineral reserves have been found in the earth's subsurface as a result of comprehensive geological research and evaluated to the extent necessary for starting their development. 'Preliminary estimated' reserves include mineral deposits identified by particular samples and evaluated through a geologically substantiated interpolation of parameters, but not through actual exploration. Russia's active reserves are composed of resources that are economically feasible to develop under current economic and technological conditions. Extracted mineral resources are considered to be industrial products: they cannot be reproduced, and are therefore categorized as non-renewable resources.

Russia's mineral base contains practically every existing type of mineral. Russia is among the leading countries in the world in terms of its minerals reserves (see Table 2): its explored reserves of oil, natural gas, and coal are about 14-34% of the world total; its iron and nickel ores are about 12-27% of their world total; and its deposits of gold, diamonds, precious, and rare metals are also abundant. The estimated value of Russia's explored mineral resources is about US\$28.6 trillion at current world prices. The share of oil, natural gas, and coal is about three-quarters of the value of Russia's mineral resources (see Table 3).

**Table 2. Russia in World Reserves of Natural Resources**

<i>Type of mineral resources</i>	<i>World ranking</i>
Oil and condensed gas	2
Natural gas	1
Coal (all types)	2
Iron ore	1
Nickel	2
Diamonds	1
Potassium	2

Source: RF MNR (2001).

About 20,000 of Russia's of mineral deposit sites have been explored, and over one-third of these are at the stage of industrial development. Five percent of the explored deposits are large and unique, containing almost 70% of total mineral reserves and accounting for one-half of domestic mineral mining. The northern regions of Russia contain the majority – again, 70% of mineral reserves.

Russia produces a significant share of the world's mineral resources: 9-10% of the world's oil; about 25% of natural gas; 5-7% of coal; 7-8% of iron ores; 12-20% of nickel and cobalt; over 10% of wolfram; 6% of phosphorus concentrate; and 12% of potassium salts. The monetary value of mineral mining in Russia accounts for about 14% of the world total – the highest per capita mineral production in the world. Most of Russia's mineral extraction is in energy resources: with natural gas at 48%, and oil at 33%.

**Table 3. Monetary Value of Russia's Mineral Reserves**

<b>Minerals</b>	<b>US \$ (in billions)</b>	<b>%</b>
<b>Oil and condensed gas</b>	<b>481</b>	<b>15.7</b>
<b>Natural gas</b>	<b>9190</b>	<b>32.2</b>
<b>Coal and schist</b>	<b>6651</b>	<b>23.3</b>
<b>Iron ores</b>	<b>1962</b>	<b>6.8</b>
<b>Non-ferrous and rare metals</b>	<b>1807</b>	<b>6.3</b>
<b>Precious metals and diamonds</b>	<b>272</b>	<b>1.0</b>
<b>Uranium</b>	<b>4</b>	<b>0.01</b>
<b>Non-ores</b>	<b>4193</b>	<b>14.7</b>
<b>TOTAL</b>	<b>28560</b>	<b>100.0</b>

*Source:* Kommersant-Daily (1997). Monetary value estimates in Table 1 and estimates in this table are not compatible because Table 1 presents assessments in rubles, and table 3 in US dollars.

Energy intensity per unit gross domestic product (GDP) is almost three times higher than in most developed countries, and despite reductions in economic activity and a decline in mineral resource use consumption per unit GDP has increased during the 1990s. The orientation of the Russian economy on extraction of mineral resources has been increasing. About one-quarter of Russia's major minerals and their resultant primary products are exported (RF MNR 1996). While most developed countries export technologies and services in exchange for raw material imports, or combine both export and import of technologies, services and expensive raw materials, Russia is a mineral resource exporter (see Table 4). Thus, although Russia surpasses many developed countries by almost two-fold in per capita mineral resources extraction, it lags behind them – again, almost by two-fold – in levels of mineral resource consumption.

The main reason for mineral resources being such a large component of Russian exports is the low competitiveness of domestic industrial products, with the exception of military equipment. Russia relies on the export of mineral resources for its hard currency revenues. From 1992 to 1999, the export of mineral resources provided about 40% of total hard currency revenues from foreign trade, about one-third of which came from energy exports. Taking into account the export of metals, oil products, electricity, and other commodities related to mineral resource processing, this share would be about two-thirds of all hard currency. Fuel, ferrous, non-ferrous and rare metals, and diamonds play a leading role in exports (Federal Directory 1999:350). Russia's export of minerals is highly vulnerable to fluctuating world prices. A favorable world market can cause an increase in exports that destabilizes of the internal market, and the decrease in world energy prices has led to serious problems with the RF's economic growth.

**Table 4. Export of Minerals from Russia, 1998**

<i>Type of mineral resources</i>	<i>Volume or Weight</i>
Crude oil, <i>mln tons</i>	118
Oil products, <i>mln tons</i>	51.3
Natural gas, <i>bln cub.m</i>	125
Coal, <i>mln tons</i>	18.2
Iron ore and concentrates, <i>thous. tons</i>	10145
Potassium fertilizers, <i>thous. Tons</i>	5119
Ferrous metals, <i>\$ mln</i>	5825
Copper ores and concentrates, <i>thous. tons</i>	39.8
Nickel unprocessed, <i>thous. Tons</i>	214

Source: RF MNR (2001).

### **Mineral Resources: Transformation of the Institutional Framework**

Russia's economy is in transition. It made the radical shift from a centrally planned economic system to a market system in the course of system reforms in the 1990s. A fundamental difference between the old and new economic systems is the way in which they signal the relative scarcity of resources: via market prices or central plans (Hensel 1959). System transformation is a very long process of substituting new institutional structures for old ones. Russia's institutional transformation is not finished yet, but the most important system feature – prices in place of plans – is now in practice. Institutions are now in place that make it possible for this new allocation mechanism to function, and planning balances have lost their allocation role.

Like that of all commodities the allocation of mineral resources has been transformed through these system reforms. The result of this change has been dramatic, not only in institutions, instrument, and tools, but also in a radical reconfiguration of the distribution of rights to mineral resources.

#### *The Soviet System of Managing Mineral Resources*

Institutional change and the replacement of one institution by another is a long-term process in which new institutions co-exist with old ones. The institutional framework of mineral resource-management in the RF originated not from an institutional vacuum, but from the Soviet system, and many of the RF's new institutions share common features with their Soviet counterparts.

According to the Constitution of the Soviet Union, mineral resources were the 'exclusive property of the state'. Soviet subsurface wealth belonged to the public only in the nominal sense that the public realized its rights to mineral resources through the state. Utilization of mineral resources without state permission was prohibited, and this could be enforced by administrative or criminal penalties. Within the Soviet system incorporation into the plan – of a ministry operating in one of the mining various or a state mining enterprise incorporated into the structure

of these ministries – was the basis for gaining rights to the exploitation of mineral subsurface sites. These ministries nominated enterprises for the right to operate in certain geological, and enterprises specializing in certain types mining got allotments to conduct mining operations free of charge – there being no prices – for a limited time period. This mechanism of access to mineral resources ensured the state enterprises' monopoly of over their use.

The Soviet government kept track of the state's balance of mineral reserves, data regarding each type of mineral resource, national demand, and the growth of explored reserves. Mining enterprises sold raw materials to domestic consumers at prices assigned by the planning ministries, but did not have direct access to export market, which was instead organized through special export organizations who transferred their hard-currency income to the state, and transacted with the mining enterprises at low domestic prices.

### *Mineral Resources in the Russian Federation: Reformed Institutions*

According to the RF Constitution 'land and other natural resources may be in private, state, municipal, and other forms of property' (RF Constitution 1993). The concrete forms of property of particular types of natural resources are fixed by federal law, and the 1992 Law on Subsurface established that the subsurface and the minerals contained in it are state property (Articles 1-2). At first glance, the Law on Subsurface seems identical to the Soviet legislation, however, in-depth analysis of its subordinated norms and rules indicates the opposite: the laws differ radically.

According to RF Law, users of the subsurface can be any sort of economic actors, and even citizens of other countries, not only state enterprises as it was under the Soviet system. Thus, a former limitation to access to the subsurface has been eliminated. User's exclusive access to a particular reserve site is established in the form of a license, which formalizes the right to the licensee to use the allocated subsurface site according to the stated goal and under the conditions indicated. (The only type of resources not covered by licensing is mining of widely dispersed minerals by owners of land plots.) Licenses are issued based on the results of an auction or a tender. Mineral resource licensing systems are the result of joint decision-making processes by the federal agency responsible for the management of the state subsurface fund (or, its regional branch), and an executive agency of the federation region.

During the Soviet era subsurface sites were allocated to state enterprises for an unlimited time period, but today time limits are fixed: for the geological surveys up to five years, for mining of mineral resources up to 20 years, and for these two purposes combined up to 25 years. The new law also puts an end to the Soviet practice of free-of-charge allocation of subsurface resources. The level of fees to be paid by license-holder is indicated in the license, and the fee revenues are divided between the RF and the region. Within the Soviet system the allocation of rights to a land-site was automatic. Within the new system licenses are allocated only on the condition of prior consent from municipal and regional land-use management agencies.

The RF's Law on Subsurface excludes any possibility of subsurface rights turnover, stating that 'subsurface sites can not be subjected to selling and buying, granting, inheriting, mortgaging, or

alienated in any other form'. This ban on transactions is also fixed by another article of this Law: 'the right to subsurface utilization got by its user cannot be transferred to third parties, including within a re-concession of rights envisaged by civil legislation'(Article 17). Once extracted, however, subsurface minerals can be federal, regional, or municipal, or other forms of property. This extremely important change from the Soviet system has opened the path to buying and selling extracted minerals, and new laws governing the transfer of rights to products extracted from the subsurface.

### *Privatization of Mining and Turnover of Licenses*

In the 1990s, during the first stage of licensing in the RF, rights to mineral resources were allocated mainly to enterprises that already had been involved in their mining. Although it originally was envisioned that licenses would be allocated as a result of tenders and auctions, an important exception from this procedure was made in the case of enterprises already involved in mining. These enterprises, as well as reserves they developed, were state property. Licenses awarded outside of the auction and tender system therefore were not regarded as a violation of the law, since neither the owner nor license-holder changed, and preservation of the status-quo was necessary to maintain the continuity of the production process. In the years that followed, rights of access to mineral reserves changed hands – accounting for many billions dollars. Such redistribution took place despite the fact that the status of rights to mineral reserves remained unchanged: turnover of licenses was prohibited.

While Yeltsin's administration privatized state mining enterprises, no presidential decree was made about the privatization of mineral reserves, which are state property according to the law. This law also excludes any turnover of rights to subsurface mineral resources, although licenses for subsurface use allocated to an enterprise could be transferred along with the enterprise when sold. Formally, the licenses themselves could not be sold, but by buying and selling enterprises the holders of licenses for many mineral sites were changed, and rights to mineral resources were concentrated among a small number of users.

The state, as owner of these mining enterprises transferred them, together with their licenses, into private property at low prices, without taking into account the value of reserves, their quantity, quality, and location, and the significant costs of their exploration. Mining companies were also sold to private owners in processes that were auctions only in name, in many cases with only one real buyer and a competitor that was an affiliated company, since access of real competitors to the auctions was limited through state auction commissions. Many of these transfers were connected with President Yeltsin's campaign for re-election in 1996, for which powerful financial groups provided support. This sort of politically-motivated decisions has had a serious impact on the distribution of Russia's national wealth. Even though the state remains the owner of mineral resources, the transfer of licenses to private companies, in combination with peculiarities of these non-renewable deposits, meant a *de facto* change of an ownership since nothing will be left of the reserve after the duration of the license.

### *Instruments of Distribution of Natural Rent*



Charges for utilizing mineral resources are an important part of a new set of mechanisms for actualizing rights that had been formally established during the of the 1990s. These payments function as instruments of the distribution of natural rent. There are several types of such payments: fees for allocating licenses, payments for use of the subsurface, excise taxes, and import duties.

All rates for licensing fees are set either as a minimum level, or as a range, which means that there are no fixed rates for the right to use mineral resources, and the procedure for establishing payments is individual in each particular case. The size of the payment depends significantly on which factors are included into its calculation. Regional affiliations of the RF Ministry of Natural Resources (MNR) are legally responsible for fixing the fee rates. The size of the payment is indicated in each license for each particular site. Currently, the government is making an effort to formalize the process of assigning fees by using the market instrument of auctions. To date, only a small number of licenses are being allocated through auctions, and fee rates are usually assigned in an arbitrary way, with regional bureaucrats playing a significant role.

Excise taxes are also payments aimed at collecting rent from mineral resources. They are established for particular types of mineral resources that are extracted from deposits with relatively better geological, geographical, and economic characteristics. Rates of excise are set individually, and vary greatly from case to case. Finally, export duties are an important instrument in collecting natural rent by collecting the difference between domestic and world prices on mineral resources. Russia's mineral prices are still lower than world prices, although the gap is narrowing. The revenue from all four types of payments is distributed among federal, regional, and local governments.

#### *New Role of the Regions: Principle of 'Two Keys'*

In the 1990s the regional governments turned from observers without rights over the management of natural resources located in their territories, into one of the most important actors controlling the allocation process. Regions' roles in mineral resources management changed dramatically as result of three important factors. First, changes in the Russian economic system together with the collapse of the command economy shifted management towards regionally-based principles. Second, changes in the political system – like a transition to real federalism – gave regional institutions a leading role to play in policy implementation within their territory. Finally, there has been a reorganization of the whole institutional structure of Russia's mineral resources management in Russia, at both federal and regional levels.

The subsurface, as state property, belongs to both the federation and to the regions. According to the RF Constitution (Article 72 1-a) possession, use, and management of the subsurface are subject to the joint authority of the federation and its regions, and allocating the use of the subsurface through licensing is to be based on joint decisions by federal and regional authorities: a principle of governance referred to as the 'two keys'. A license allocated to a mining enterprise has to have not one, but two signatures – one of them belonging to the governor of the region.

Local authorities or municipalities may take part in licensing, although they are not equal actors in it, and play an insignificant role in the regulation of access to mineral resources in the 1990s. Regional authorities considerably limit the effectiveness of municipal agencies through laws adopted on the regional level (sometimes in violation of the RF Constitution) and through methods of implementation. The goal of the regional authorities has been to put all types of resources (natural, financial, administrative) under their own control. The delimitation of authority was accomplished by treaties between the RF and the regional governments. These treaties have usually been supplemented by a number of agreements on the division of authority in specific fields, including mineral resources.

### **Crisis of Reformed Institutions**

#### *Crisis of the 'Two Keys' Institution*

The reconfiguration of rights to mineral resources during the 1990s has been closely associated with changes in the relative positions of the regions. As often happens with institutional changes, they in turn generate new problems that cannot be imagined at the initial stage of reorganization. Each of the RF's regions built up very different institutional structures for mineral resources in this period. Regions' freedom to develop institutions independently was due to the nature of Russian federalism, in which regional forms of government can vary. Forms of government adopted by the regions include: republics, krays, oblasts, federal cities, autonomous oblasts, and autonomous okrugs (variations inherited from the Stalin-era Soviet Union). The RF Constitution declares these forms of government all 'equal subjects of the Russian Federation' (Part 1, Article 5), but in practice the RF is an asymmetric federation: the status of the regions is not equal. Treaties on the division of authority have augmented the asymmetry of the RF, since all of the treaties are negotiated individually with each region.

Some regions have established complete regional control, and not only control access to mineral resources, but also have declared themselves as sole-owners of minerals on their territories and have unilaterally assumed revenues from their development. The RF is excluded from any form of control in these cases, and the functioning of the 'two-keys' principle has terminated in these regions. At the other extreme, some regional governments have had their authority reduced to the level of municipalities.<sup>1</sup>

A number of regions have withdrawn property rights to minerals from the federal center by claiming the mineral resources within their territories as their sole property. In this way, some regions have assumed complete ownership of their subsurface. Other regions have acquired sole authority over their mineral resources by establishing regional control over mining companies through a process of turning the mining companies into joint-stock companies and then acquiring a controlling share of the company and its licensed mineral deposits. This process may appear to be privatization, but would more accurately be described as regional 'nationalization'.

The assumption of control over mineral resources by regional authorities is performed in the interest of the regional power clan, not in the interests of the population inhabiting the regions. In many regions the current governing elites came into authority by having been powerful actors in the region in the Soviet era. Democratic institutions in these regions serve mainly as an external

facade, while authoritarian methods persist. The administration is controlled by a small leadership group all related to the same clan, and members of this clan control these regions' mineral resources.

### *Licensing and its Problems*

After the reforms of the early 1990s, it seemed as if Russia had already established the necessary institutional structure for licensing, however, there has been a lot of critique indicating serious shortcomings in the established structure:

- About 30% of issued licenses do not comply with existing legislation.
- In many cases licenses were allocated without any public tendering of bids, and moreover, they have been granted to resource users who did not have any right to them.
- Re-registration of licenses to new users was undertaken in violation of RF law.
- Quite often the subsurface has been mined without any license at all.
- Licenses often violate federal legislation, due to divergences in regional laws on the subsurface.
- Most license holders accumulate significant debts through non-payment of licensing fees.
- Licenses were issued mainly via tenders, not auctions, and potential licensees competed by offering unrealistic bids, willingly believed by the commissions.<sup>2</sup>
- A common practice of transferring licenses to third parties formed 'grey' markets for licenses (Izvestia 2001).

The licensing mechanism is like a one-way street in that it serves the interests of only one partner in the licensing agreement, instead of both: licensing procedures are constantly violated in interests of license-holders; license-holders are not held accountable for license conditions; sanction mechanisms do not function, or are not applied to violators; and charges for mineral resource use are not paid. Licensing is used throughout the world as an instrument regulating access to mineral resources, but implementation of licensing agreements in the RF is performed in an institutional framework that allows for modification of the standard licensing mechanism. Licensing agreements cease to function when they are signed, not only because license-holders simply violate the conditions of the license, but also very often due to the fact that the state winks at these violations and connives to abet them. Government bureaucrats have privatized the state's assets to forward their own private interests. At the same time, it cannot be said that licensing does not function at all – licensing serves to protect the interests of powerful license holders.

### *Non-transparency, Frictions and Conflicts*

The participation of regional governments in subsurface management has led to a number of serious transparency problems. The 'two keys' institution is made up of a long chain of

coordinated decisions and is therefore very vulnerable to the method chosen for decision-making. A poor decision-making method can result in an endless, fruitless process, and, as a result, various frictions – loss of time, postponement of decision-making, and increased coordination costs.

The distribution of payments between regions and the federation also leads to serious conflicts. Payments collected from the use of mineral resources are distributed among the federal, regional and local governments. The distribution of certain types of payments occurs annually, subject to approval in the state budget. As a result, significant bargaining between the federation and the regions takes place annually around the federal budget, and the adoption of the budget is followed by significant informal ‘corrections’ in the actual distribution of payments. Regions attempt to draw the revenues from mineral licensing into their own budgets, and there have been numerous complaints from the RF State Tax Service of regions violating the procedures for distributing payments for natural resource use.

Several modest steps have been undertaken to divide subsurface property between the RF and its regions, but progress has not been significant. The progress in delineating regional and federal authority has not been much better: treaties and agreements on the division of joint authority have not established a norm, and do not provide uniformity for the RF’s subsurface legislation. The institutional structure defining rights to minerals is based not on regular rules, but on exceptions, concessions, and individual privileges. Many laws on mineral assets adopted by the regions contradict to the RF’s laws – a situation that does not make rights of access to minerals transparent and stable, and does not provide clear and uniform procedures for their allocation.

The treaties on the division of authority often touch upon other issues, which is why their dissemination quite often is restricted. Opponents of these treaties point out that since all regions are equal in their relations to the federation under the RF Constitution, it is against the law to grant to some regions subsurface rights that are not granted to other regions. Thus, attempts to regulate authority over the subsurface through treaties and agreements has had the effect of creating instability and has turned the regulation of rights to mineral resources into a sharp political conflict. Naturally, such an institutional environment increases uncertainty and risks for investors, as well as increasing the costs and time necessary secure mineral rights.

### *New Monopolistic Structures*

A market system can be effective only when there is a competition. Without competition the market degenerates, and the system loses its effectiveness. In Russia in the 1990s, competition was crowded out by political rivalry, efforts to extract unilateral concessions from the state, non-payment of taxes, and bribes. In the mid-1990s powerful financial groups established relations with the state authorities in Moscow. These relations were not based on law, but on personal connections. For several years now, these groups have possessed oligarchic power, and have used it in their own interests, including using it for the monopolization of mineral resources.

During the 1990s, new monopolistic structures of mineral resources management replaced the state monopoly of the Soviet period. The greater part of mineral resource deposits were

distributed among a small number of private mining companies: big oil companies took control of a 30-40 years supply of explored reserves, allocated from the state at no cost. The ownership of reserves was concentrated in several big companies that turned into monopolies. The problem is not that so few mineral deposits remained in the national reserve, but that those that remain are, primarily, deposits of questionable quality or poorly explored deposits requiring further geological surveys, while many mining companies have supplied themselves with private reserves for the decades ahead have no intention to fund exploratory activities, and are moving their revenues from mining abroad without having paid any taxes.

Concentration of licenses for the best mineral deposits within a small number of mining companies, which are not participating in site exploration and do not pay for geological information or access rights, and the formation of a monopoly on these deposits are among the most serious implications of today's licensing system. The oligarchs do not want to subordinate themselves to regulatory norms, and move \$240 billion abroad illegally primarily in shadow revenues from the misappropriation of natural assets (Izvestia 2001).<sup>3</sup>

### *Reduction of Mineral Reserves*

The sustainability of mineral resources is sometimes understood as a balance between their extraction and the discovery of new deposits. Since 1991, mineral resource extraction has primarily exploited previously explored reserves. Despite curtailing extraction during the 1990s, Russia's explored deposits were declining for many types of mineral resources. Today, the flow of newly explored deposits of major types of reserves is lower than the volume of extraction: The ratio of newly explored reserves to mineral resource extraction is 31% for natural gas, 50% for lead and zinc, and 33% for nickel.

A reduction of deposits for major types of mineral resources, including oil and gas, took place. A greater share of reserves are minerals that are difficult to extract or of low quality. The number of newly explored sites and their average size have declined. Russia today already faces shortages in some mineral resources.

As a result, the country relies on deposits that were explored 10 to 20 years ago. According to experts at the MNR 'there might be a serious impediment in mineral resource complex functioning' (RF MNR 2001).

Several factors led to this trend of declining mineral reserves: a significant reduction in mineral exploration during 1990s; a six-fold reduction during the 1990s of financing for geological exploration; a tense atmosphere in traditional mining territories;<sup>4</sup> a shift by mining companies to selective mining of rich deposits has resulted in significant under-utilization of poor deposits;<sup>5</sup> and a reevaluation of deposits according to market economy criteria has caused significant corrections to the total estimated value of mineral resources. During the Soviet period, state value of mineral resources did not take into consideration differences in quality, location, distance from transport systems, or technical conditions. Under market conditions estimation methods have been changed, and poor quality sites tend to be excluded from the list of reserves. In recent years, concern is growing that the RF's potential as a mineral exporter will remain

unrealized. Russia still maintains large number of geologists and other specialists, but the migration of qualified specialists to the West and cuts to research and development exacerbate the situation.

### **Wealth and Poverty in Russia: Regional Distribution**

#### *Distribution of Mineral Resources across Regions*

Mineral reserves are unevenly distributed over the territory of the RF, with only a minor portion of them situated in European Russia. West Siberia and some areas of East Siberia are the richest in mineral resources. The 89 RF regions can be divided into six categories based on the amount of mineral resources they contain:

Category 1 – \$7000-8000 billion in mineral reserves: Yamalo-Nenetsk autonomous okrug.

Category 2 – \$3000-4000 billion: Hanty-Mansy autonomous okrug, Perm oblast, Kemerovo oblast.

Category 3 – \$900-1200 billion: Sakha republic, Irkutsk oblast, Krasnoyarsk kray, Sverdlovsk oblast, Komi republic, Murmansk oblast.

Category 4 – \$200-500 billion: Sakhalin oblast, Dolgano-Nenetsk autonomous okrug, Archangel Oblast, Orenburg oblast, Rostov oblast.

Category 5 – \$100-200 billion: Primorskiy kray, Chita oblast, Buriatia republic, Tuva republic, Hakassia republic, Tomsk oblast, Bashkortostan republic, Tatarstan republic, Samara oblast, Astrakhan oblast, Dagestan republic, Belgorod oblast, Kursk oblast, Evenkiyskiy autonomous okrug.

Category 6 – Reserves accounting for less than \$ 100 billion: remaining 59 regions of the RF.

Two autonomous okrugs head the list of the richest regions. Yamalo-Nenetsk autonomous okrug and Hanty-Mansy autonomous okrug, respectively, account for the majority of the RF's natural gas and oil reserves. In addition, Dolgano-Nenetsk autonomous okrug contains the majority of the RF's nickel, cobalt, and palladium.

#### *Poverty in Russia: Regional Distribution*

At the end of the 1990s the coefficient of income differentiation (the ratio of the highest incomes decile to the lowest income decile) in the RF was 14.5. Of low-income group, two-fifths had incomes less than half of the minimum living wage (RF Government 2000). The volume of social welfare was decreasing, while the federal and regional governments' debts to social welfare institutions were growing.<sup>6</sup> Poverty in Russia was worsening, as is evidenced by the increasing share of households with per capita income lower than the minimum living wage (see Table 5).

**Table 5. Households with Per Capita Income Lower than Minimum Living Wage**

	% of households		
	1997	1998	1999
<b>All households,</b>	25.7	30.4	42.3
<i>rural</i>	23.5	28.3	40.9
<i>urban</i>	31.7	36.3	46.2
<b>Households with unemployed members</b>	53.8	58.4	69.2

Source: Russia's Statistical Yearbook (2000), pp.163.

In 2000, the regional difference in per capita consumption (excluding Moscow) was about eleven-fold. By subdividing Russian regions into three groups by their level of income, the group with the lowest income includes 36 regions, or 40% of regions in the RF. Comparing these three income categories with the six groups assigned by the level of mineral reserves, shows that the poorest of the income categories does not include any regions from the four richest mineral resource categories. The RF's poorest regions are those where mineral reserves are lower than the Russian average and are not developed due to an absence of necessary transport infrastructure, or lack of mineral resources of high liquidity, like oil and gas.

In 1999 the share of the population with incomes lower than the minimum living wage was lowest in the two regions with the largest and most liquid mineral reserves, Yamalo-Nenetsk autonomous okruig and Hanty-Mansy autonomous okruig. The incidence of poverty in these regions was not only much lower than the RF average, but it was also lower than in Moscow (Russian Statistical Annual 2000).

### Regional Structure of Investments

Another way to categorize the regions is to divide them into three groups depending on their share of the RF's total investments in fixed capital. The first group would consist of 16 regions that each have a very high share, 1.5% or more, of the RF's total capital investments. Eleven of these regions are among those with the largest mineral reserves, including Sakhalin oblast, Krasnoyarsk kray, Komi, Tatarstan, Bashkortastan, Komi republics, Hanty-Mansy and Yamalo-Nenetsk autonomous okruig, Perm and Sverdlovsk oblasts.

The group with the lowest level of investments in fixed capital – less than 0.5% of the Russian total – consists of 43 of the RF's 89 regions. There are no regions with large or medium mineral resource reserves in this group. The regional structure of capital investments clearly indicates that, with the exception of Moscow and St. Petersburg, investments in Russia are directed, into regions rich in mineral resources, and away from regions poor in mineral resources. Redirecting investments into processing industries, service sectors, and particularly into regions poor in mineral resources remains a serious challenge for Russian economic policy.

### Distribution in a Regional Context: Sakha

The economy of the Sakha Republic (also called Yakutia) is based on diamond mining. There are two opposite attitudes regarding Sakha's economic performance. The first attitude, supported by Sacha's former President Nikolaev, is as follows:

1. Per capita income in Sakha is 1.5 times higher than the RF average.
2. During recent years Sakha's industrial production has increased, while that of the RF as a whole has decreased.
3. Major construction has begun on railways, a new hydroelectric power station, a large diamond mining combine, an oil-processing factory, oil and gas pipelines, a polygraph enterprise, an international airport, a powerful water supply system transferring water to arid areas of the republic, and the renovation of infrastructure in the region's capital, Yakutsk.
4. The economy of Sakha is based on a solid financial foundation.
5. A stable economy is the basis for social policy implementation. While social programs have been shrinking in Russia overall, in Sakha a serious social program has been planned and implemented. An institution to protect the nationalities inhabiting Sakha has been created. Revenues from Alrossa's<sup>7</sup> activities were used for a number of large investment projects, like the sports complex, swimming pool, ice stadium, and center for motherhood and childhood, unique in Siberia, that were constructed in Yakutsk. Sakha's authorities allocate considerable resources to sending young people to the most prestigious universities in the world. Also, state policy aimed at the rehabilitation of traditional spheres of economy and crafts has been implemented.
6. Serious limitations for acquiring Yakutian citizenship have been introduced during the 1990s, as well as limitations on visits of foreigners, the flow of erotic and crime films, mass-culture, and trendy religious sects. A spiritual academy was created in Sakha, as well as various associations aimed at the preservation of language, folklore, and national traditions.

According to the opposing point of view, from 1992 to 1996 Sakha's leadership was involved in building 'Yakutian socialism' on money from diamonds and federal transfers. Shipments of fuel and foodstuffs were provided to Sakha mainly with the help of financing from the federal budget. Untaxed diamond money together with money subverted from the federal budget allowed Sakha to occupy a very high place in rankings of per capita income by region. At the same time delays in the payment of salaries, mostly in urban areas, have been from one to several months, and have resulted in strikes. Yakutia was bathed in social programs. Deer breeders received foodstuffs, fuel, and hunting gear practically free of charge. Yakutia came to be ranked first in Russia in per capita housing construction, and public transport became free. Spending on children rose to the highest levels of anywhere in Russia. A large medical center, new university, airport, stadium, and a music school for talented children were constructed. Yakutia purchased 'A-310' airbuses, and had a cut-diamond painted on a tail of each one. At the same time, numerous construction projects have been realized in Sakha without any tenders, construction prices have been overstated by several fold, and large hard currency resources were turned into a sinecure for regional bureaucracies (Kommersant-Vlast 1998:42,45).



## Poverty and Mineral Wealth

Judging by its per capita volume of mineral resources, the RF would appear to be among the richest countries in the world, but instead it lags behind most developed countries in terms of per capita income. Today, a significant part of the Russian population are paid at a level below the minimum living wage. Such regional indicators as per capita income, per capita consumption, and the regional share in investments correlate very closely with each region's share of Russia's mineral resource reserves: the more mineral reserves, the less poverty. The economic situation in regions rich in oil, natural gas, diamonds, or non-ferrous metals is much better than in mineral-poor regions with manufacturing. Perhaps for these reasons, some of the regions rich in mineral resources have shifted to policies of limiting immigration.

The causes of poverty in Russia, however, are not predetermined by the naturally unequal distribution of mineral resources across regions. The deep, long-term economic depression of the 1990s had a negative impact on regions with manufacturing, as well as instigating an inadequate policy of economic growth on federal and regional levels. An inadequate institutional framework shaped the economic development of the country as a whole and of each individual region through the distribution of natural rent between the federation, regions, and mining companies; the growth of corruption and the shadow economy; the acceleration of illegal capital flows out of the country from natural resources development; and particularly, specific regulations on access to and property rights over mineral resources.

## **Governmental Strategies to Overcome Crises**

### *Changes in Mineral Resources Policy*

The institutional framework of mineral resource policy was impacted by Russia's ongoing system reforms starting in the beginning of the 1990s. At the end of this period, a lively discussion was initiated concerning the results of these reforms, and it became clear that a second round of reforms would be needed. Over the past two years President Putin has been deeply involved in implementing this new round of reforms. It would be naive to expect that failures in first round of reforms did not affected mineral resource management, indeed, severe crisis has been observed in this sector, and is yet to be resolved. Improving mineral resources policy is considered essential by the RF government, and the MNR has already proposed a new policy strategy.

Economic growth is the main priority in the government's economic policy and the new round of economic reforms. It is difficult to argue with such an approach, particularly, taking into account the deep and long-lasting economic depression in which Russia's GDP declined by 50% over the 1990s. Putin's inclination for turning economic policy towards growth is supported by a Russian public tired from poverty and the impacts of demolished social institutions. Russia's shift towards stable economic growth is a major element in its modernization program as are the recovery of important social institutions, and a strategy of poverty reduction. Mineral resources serve as the base for the RF's economic recovery.

V. Artuihov, the new minister of the MNR, emphasized the necessity ‘to form new mineral resource strategy and national policy in this sector’, and said the focus should be ‘urgent and principle correction’ of the policy. Among the goals of the MNR’s new policy are the following:

- current minerals extraction should be balanced with increases in explored reserves;
- serious changes are needed in the institutional design for allocating rights to subsurface use;
- policy should be expanded to include a ‘one-key’ principle;
- significant changes should be incorporated into procedures of using mineral resources to keep mining companies from hoarding mineral resources.<sup>8</sup>

In this context the new minister declared a set of concrete measures aimed at putting the licensing system into order. These measures include:

1. An inventory of formerly issued licenses.
2. Application of sanctions to license agreements violators, including license revocation.
3. Annual verification of licenses.
4. Regulation of the whole licensing chain, including procedures of auctions and competitive bidding.
5. Allowing the results of license competitions to be revised.
6. Exploring an approach according to which national industry, and particularly high-tech industries, would be freed from taxes, with a simultaneous transfer of the tax load into the resource-payments sphere (V. Artuihov 2001).
7. The MNR will consider every license issued for geological exploration as a commitment from the licensee to participate in the mineral deposits recovery program (V. Artuihov 2000).

An important objective of the new mineral resources policy is to increase mineral reserves that depleted during the 1990s. The MNR is applying several strategies towards this purpose, including measures for increasing the financing of geological exploration. Three methods are being used to implement this strategy: selling information from geological surveys; allocating licenses in a way that maximizes the advantage to the state; and using fines as punitive measures for current or ongoing license violations.

The new MNR policy does not redistribute previously allocated property rights, and it does not attempt to change previous allocations or punish those responsible for corrupt allocation procedures from the past. The focus is on ending the constant practice of license violations, not on redistributing property rights. It is a bit premature to evaluate the real results of this policy: the MNR’s efforts face many counter-actions and pressures from lobbyists. License revocation will be accompanied by law suits, and may take years.

The new MNR management began by requiring license-holders’ compliance with the conditions of their licenses (V. Artuihov 2002). Currently, the MNR is in the process of planning additional measures:

- Rejecting the ‘declaration principle’ (when a mining company’s need to have a particular site at a particular time motivates authorities have to organize a tender for rights to the site) for obtaining rights of access to mineral resources, and transitioning to allocation of rights to access according to the ‘programming principle’ (in which licensing priorities are instead motivated by long-term program goals for the sustainable exploration and development of natural resources).
- Legislating limits for the size of sites covered by a license.
- Creating a clear division between the RF and the regions in their authority over licensing.
- Defining a ratio between a company’s available production facilities and the mineral assets it possesses, as a mechanism of freeing up previously allocated mineral reserves.

The shift to a ‘programming principle’ takes into account national and regional development, projected mineral resource balances, and expected income from mineral sales. The MNR believes that if these innovations are not introduced, Russia will follow the existing practice of plundering mineral resources instead of choosing the path of sustainable development.<sup>9</sup> It could be said that the MNR’s shift to extremely liberal – or at least chaotic – methods of licensing administration represents a dirigisme of mineral resources management. The question of how well the MNR’s new mineral resources policy correlates with the modernization program and the course of the new government towards de-bureaucratization remains open.

Changes in the distribution of authority over mineral resource allocation between the RF and the regions are another significant innovation in mineral resources policy. The new interpretation of the norm of joint authority over subsurface management is essential, and several times the MNR has had to declare the necessity to expand the category of ‘subsurface of federal importance’, and to apply the ‘one-key’ principle. Early in 2002, the MNR decided to substantially reorganize its system of territorial management with the goal having regional agencies be responsible for making decisions in the national interest, and thereby avoiding a tug-of-war between the RF and the regions.

### *Policy in Development of the North*

The RF’s program of modernization relies on a vision of a ‘new strategy of territorial development in the country’ and overcoming a number of negative trends in territorial development that emerged in the 1990s (RF Government 2000). Of particular interest is the RF’s development strategy for the regions possessing the largest reserves of mineral resources – most of which are situated in the north of Russia, both in the European and Asian parts, and include, but are not limited to, regions above the Arctic circle containing areas of permafrost.

The mineral reserves that have the greatest role in maintaining Russia’s economic development are concentrated in this area: natural gas, apatite concentrates, non-ferrous and precious metals, including nickel, copper, cobalt, platinum, and palladium. Eighty percent of the RF’s natural gas explored reserves, and 90% of extractable hydrocarbon reserves from the Russian continental shelf are situated in the Arctic. Regional production contributes about 11% of national GDP and 22% of national exports, while the area’s population accounts for 1% of the national total (RF Government 2001).

The state regulates economic development in the Arctic through control over prices and tariffs, and the application of flexible tariffs on fuel, foodstuff, and consumer goods deliveries along the Northern Sea Route (RF Government 2001). Russian laws stipulate broad state support to these northern regions with financial obligations assumed by the federation. These obligations surpass the RF's ability to meet them, and they are implemented irregularly.

The RF's modernization program poses a question about the need to reconsider and reform policy towards the northern territories. Economic restructuring of the North must take into consideration new market conditions. Northern enterprises have to face several stages of qualitative changes, including a reduction of the state subsidies. Urgent measures, like a transfer of social services provision to northern municipalities and a reduction in the number of personnel, are necessary to save potentially vital enterprises. A contract system is being planned for all state employees, federal and regional. State support of low-income groups must take into consideration the more expensive living conditions in the northern region. Migration policy will be oriented towards resettlement of excessive population, primarily pensioners, to other regions of Russia.

#### *Governmental Strategy of Poverty Reduction*

Poverty reduction through the reform of social welfare institutions is among the goals addressed by the RF's second round of reforms. This program's approach is based on the perception that the social welfare system, with its focus on social transfers and subsidies for goods and services, is unable to solve the problem of redistributing resources in favor of the poorest households. The share of the population with a right to social guarantees, privileges, and subsidies, as defined in Russian legislation, is approximately 70%, that is, about 100 million people. More than 45.5 million are covered by 9 major types of social care and compensation systems. The demand for federal financing of privileges and subsidies is estimated at 15% of GDP – ten times what the federal government spends on social services. In the deep depression of the 1990s, when GDP fell by 50%, under-financing of social programs was wide-spread: none of social functions of the state was implemented according to the RF's qualitative and quantitative measures. In fact, healthcare and education are no longer free to the public, and a number of other services have become inaccessible to the poor.

The current distribution of public subsidies is as follows: one-quarter of subsidies and privileges is allocated to households with incomes lower than the minimum living wage, while three-quarters is allocated to households with incomes higher than the minimum living wage. That is why the modernization program includes modifications in social policy. A precondition for the new social policy is transition to a 'subsidiary state' model, which would provide a redistribution of social spending in favor of the most vulnerable public groups and a simultaneous reduction of social subsidies to well-to-do families. Major goals of this policy are to provide social security for the most vulnerable households; to provide accessibility to basic social welfare, including medical care and general education; to create conditions allowing an active part of population to get a higher level of social services consumption to be covered from its own incomes and to

catalyze, not limit, economic growth by prioritizing investments in human capital, like health-care and education.

Complying with federal legislation on social assistance accounts for the majority of local authorities' spending on social services, but only 30% of this spending is reimbursed to the municipalities. Local authorities practical flexibility in implementing social services is severely limited. The task at hand is to broaden regional independence in decision-making regarding what particular subsidies they require.

## **Conclusion and Further Discussion**

Russia possesses mineral resources with a monetary value higher than that of any country in the world, and nature plays a crucial role in defining Russia's production and income levels. For the long time, Russia has had significant problems in managing its mineral resources. The RF government made two major attempts to solve institutional problems in this field: first, through radical changes of their institutional framework in the 1990s and second, through modernization of mineral resource policy at the beginning of the 2000s. The RF has made radical changes to its institutional structure, while at the same time solving the problems inherited from non-rational management of mineral resources during the Soviet regime.

Soviet institutional structure for the management of mineral resources was designed to provide rapid and unlimited access to mineral resources for state enterprises. For these state enterprises, getting access to mineral resources was neither time consuming nor financially costly. State monopoly, however, did not allow realization of any alternatives in mineral resources management, which resulted in inefficiency and failed to protect mineral reserves from depletion.

In the course of Russia's system reform in the 1990s, a number of important changes took place in the institutional framework for mineral resource management. First, the monopoly of the federal government over mineral resource management was abolished, and regions began to share this authority. Second, the monopoly of state enterprises over access to mineral resources was abolished, and private enterprises and individuals, including non-residents, can now obtain licenses. Third, fees for access to mineral resources, time limits on licenses, and the allocation of licenses through action and tenders were introduced. Fourth, the construction of a new sophisticated administration for mineral resources management was launched, including a new legal framework and a special body within the RF government – the MNR.

The transition to a new system of managing of mineral resources has helped in solving old problems, but at the same time new ones have emerged:

1. The institutional structure defining rights to Russia's mineral resources is based not on regular rules, but on exceptions, concessions, and individual privileges. This irregularity does not make rights of access to mineral resources transparent and stable, and it does not provide for clear and uniform procedures for their allocation. Naturally, such institutions contribute to uncertainty and risk for investors, as well as increasing transaction costs.

2. Progress in dividing subsurface property between the federation and the regions has not been significant. Many laws on mineral resources adopted by the regions contradict the RF Constitution, and treaties and agreements on the division of joint authority fail to create a general norm.
3. Treaties on the division of authority over mineral resources in one region often affect other regions, leading to political conflict. Opponents of these treaties point out that it is against the RF Constitution to grant to some regions subsurface rights that are not granted to other regions. The distribution of payments between the regions and the federal government also leads to conflict.
4. Licensing agreements in Russia have not been enforced, and as a result many obligations are not being met.
5. In many cases licenses were allocated without a competitive process, and most license-holders owe significant licensing fees. In many cases the development of mineral resources takes place without licenses, in which case there is no competition and no payment.
6. Licenses for the best mineral reserves are highly concentrated in a few hands.
7. Considerable natural rent obtained from the sales of minerals is illegally transferred abroad by mining companies and hidden in off-shore accounts without paying taxes.
8. A significant portion of the Russian population makes an income lower than the minimum living wage. Russian social institutions are also poor, and are not able to finance the supply of most important public goods. Municipalities bear the brunt of the responsibility for allocating public goods, but they lack adequate financing. The Russian public has not benefited from the new system of mineral resources management, with the exception of those individuals and clans who established control over the revenues from mineral resources.
8. Mining monopolies do not invest in exploring new reserves, and instead transfer their financial assets off-shore. As a result, newly explored reserves are dwarfed by the extraction of previously explored reserves, and mineral reserves are being depleted. Russia lives off of its future generations.

Under these conditions the new RF government proposes to renovate mineral resource policy, with a strong emphasis on increasing state mineral reserves. The new policy includes such measures as inventory control, verification of license-holder's compliance, punishment of violators, and even license revocation. The division of authority over mineral resource allocation between the federation and the regions seems to be the next significant area of innovation in the RF's mineral resources policy.

However, the most important problems in Russia's mineral resource development can be solved only in a broader framework. There are high expectations for Russia's vast mineral resources becoming the base for a path of sustainable development. Relying on resource wealth is expected to promote economic restructuring, revitalize and develop the high-tech, manufacturing, and service sectors, and end Russia's dependence on exports of oil and natural gas. During the Soviet regime mineral resources played an extremely important role: social stability, imports of foodstuff, and financing of military expenditures were maintained through oil and gas exports.

But the Soviet system only managed to support the status-quo: neither institutional modifications, nor structural changes in the economy were undertaken. Time was lost, and after radical decline in world oil prices the Soviet system entered deadlock. Today, the natural assets of Russia, and particularly, its mineral resources are destined to play a crucial role in the modernization program aimed at significant institutional innovations and a transition to rapid economic growth and a new economic structure. Russia is facing serious difficulties while moving along this path, and its existence and future depend on overcoming these barriers.

Analysis of these problems and strategies for their solutions are a goal for future research. A natural assets-building approach could be applied as part of a research agenda, and would be particularly valuable in solving the problem of transition to sustainable development. Russia has not yet succeeded in using its rich mineral resources as a basis for shifting to sustainable development. Today revenues from mineral resource development are a means for promoting only a minimum level of social stability, with the constant threat that even this minimum may not be provided. At the same time, with reduced mineral export revenues it is no longer possible to support high-tech industries and the military sector. This minimum level of economic and social stability is fragile, and at any moment it could be destroyed since it depends on preserving high oil prices – a parameter that is beyond the control of the RF government.

The RF government has during the last decade acted with a maniacal stubbornness in waiting for a decisive impulse or a sudden inflow of foreign investments to change the path of Russia's development. Until recently, however, such strategies appeared to be ineffective and the RF did not succeed in attracting significant investments from abroad. In those cases when large foreign investment projects were realized in Russia, they were in mineral resource sector and reinforced the mineral dependence of the Russian economy. Very recently, rich mineral resources were blamed by experts a reason for failure in economic development. This viewpoint was discussed on Russian television in mid-November of 2002, 'Rich natural resources – punishment for Russia?' Ministers, policy-makers, scientists, and journalists took part in the discussion, but as it often happens in these sorts of debates, they did not succeed in formulating a distinct answer to the question posed. The RF's failure in identifying an effective development strategy has led to an emerging interest in China, which does not possess huge mineral resources and yet is successfully developing.

Thus, the search for an effective strategy for Russia's transition to sustainable development is a large-scale and a critical problem. There is a high probability that further delay in finding a solution might result in dangerous conflicts with negative implications not only for Russia, but for the international community. Public interest within the RF towards finding effective strategies for dealing with this problem is extremely high. All these factors taken together point to the need for a more intensive search for solutions, and for testing and comparison of various strategies, including those the natural assets building approach.

## Endnotes

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<sup>1</sup> Currently, a reform aimed at the distribution of authority, responsibility and financial resources between three levels of government is being elaborated in Russia. One of its major goals is to revitalize the activities of municipalities. However, barriers erected by regional administration and the local public's distrust of any such reforms counteract these developments. Municipalities are significantly infected with the virus of corruption.

<sup>2</sup> Competitors offer a bonus, or guarantee of payment to be executed immediately after the tender or auction. This payment is to be made by the new license-holder to the government. Promises for the start of deposit development and production levels are made at tenders. Only bonuses are placed at auctions, while the dates of reserves development and production levels should not be worse than those already defined by conditions of the auction. Thus, tenders have been a comfortable instrument of corruption, and many competitors participated.

<sup>3</sup> Expert estimates of the shadow revenues flowing from Russia are based on analyses of items in the national balance of payments. Assessments of flow might vary significantly. According to the mostly often cited estimate the flow during 10 years accounted for \$2 billion per month, a round table organized recently by Moscow newspaper 'Izvestia' estimated capital flow from Russia at \$250-350 billion.

<sup>4</sup> Due to intensive developments of explored reserves the provision of mining enterprises in these territories with mineral reserves has sharply worsened.

<sup>5</sup> Mining companies' aspirations for concentrating their efforts on sites with rich deposits can be explained by significant increases in the productivity of labor and capital in this case, and by simultaneous decreases of costs per unit of extracted minerals. Mining companies are not worried about decline in productivity of the factor from low fees. This situation can worsen, when mining companies manage to evade taxes and illegally move their revenue abroad, because they act in a limited time-frame, and poor reserves remain unused. (The author is grateful to J. Boyce this analysis.)

<sup>6</sup> Statistics on income distribution in Russia should be handled with care: this data is significantly impacted by the shadow economy. The shadow economy pays most of the salaries of those involved in it 'under the table', and these salaries are not included in official reporting.

<sup>7</sup> Alrossa is the company extracting diamonds in Sacha.

<sup>8</sup> When the strategic priority of a company, which has accumulated licenses for the best sites, is to move revenues abroad and not pay taxes, it means that these financial resources would not be invested into development of mineral reserves according to time-frames and volumes fixed in licensing agreements.

<sup>9</sup> In this context, sustainable development means a transition to development based not on non-renewable resources, but on the high-tech and service sectors.



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