REFORM OF POLLUTION CHARGES IN THE RUSSIAN FEDERATION:
Assessment of Progress and Opportunities and Constraints for Further Improvement

OECD

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where the governments of 30 democracies work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy, and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice, and work to co-ordinate domestic and international policies.

The OECD Member countries are: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. The Commission of the European Communities takes part in the work of the OECD.

OECD Publishing disseminates widely the results of the statistics gathered by the Organisation and its research on economic, social, and environmental issues, as well as the conventions, guidelines, and standards agreed by its Members.

• • •

This work is published on the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the Organisation or of the governments of its Member countries.

FOREWORD

The OECD has been working on environmental taxation in the Russian Federation since 2001 as part of its programme of support for Russia's ongoing tax reform process. The recommendations of the OECD Economic Survey of the Russian Federation and the OECD Environmental Performance Review of Russia were important contributions to this work.

This report focuses on reforming pollution charges, which are the main and most comprehensive type of economic instrument used for environmental protection in Russia since 1992. The document aims at influencing the ongoing discussion in the Russian government on the preparation of the new federal law "On Payments for Negative Impact on the Environment." The report analyses several proposed drafts of the law and provides recommendations for a far-reaching reform of the pollution charge system in Russia based on the broader OECD work on economic instruments for environmental protection.

The report was prepared by Eugene Mazur and Alexander Martoussevitch of the Non-Member Countries Division of the OECD Environment Directorate. The authors are grateful to Dr. Jochem Jantzen and Dr. Stefan Speck for contributing to key parts of this document. Also acknowledged is the important role of the Russian Regional Environmental Centre and Russia's Higher School of Economics in co-organising the expert workshop in Moscow on 11 March, 2004, where the report was presented and discussed.

This report has been prepared within the framework of the OECD-Russia environmental cooperation carried out by the OECD's Centre for Co-operation with Non-Members (CCNM).

TABLE OF CONTENTS

ACRONYMS

EECCA	Eastern Europe, Caucasus and Central Asia
ELV	Emission (Effluent) Limit Value
EU	European Union
MAC	Maximum Allowable Concentration
MOSES	"Model on Sustainable Environmental Scenarios"
OECD	Organisation for Economic Cooperation and Development
RUR	Russian rouble
TELV	Temporary Emission (Effluent) Limit Value

1. INTRODUCTION

During the last two decades, the use of environmentally-related taxes and charges, including pollution charges, increased in countries all over the world, particularly in many European OECD countries. It became increasingly recognised that environmental policy based on regulatory instruments, despite some successes, has in some cases failed to address new environmental pressures and prevent further environmental damage. Moreover, such instruments impose potentially high costs to achieve environmental quality objectives. In recent years, economic instruments have been recognised for their flexibility, cost-effectiveness in attaining environmental objectives, and the incentives they provide for introducing innovative technical solutions to environmental problems.

The increased interest in market-based instruments in OECD countries has been analysed in various reports published by the OECD and other international organisations. Examples of their successful implementation are significant reductions in water pollution since the 1970s in France, Germany and the Netherlands as a result of the combined use of effluent charges and command-and-control requirements (OECD, 1999b). Economic instruments have become an essential part of policies to combat regional (e.g., sulphur dioxide) and global (carbon dioxide) pollution in many OECD countries, as well as in many countries in transition to a market economy and developing nations.

Russia, similarly to other countries of Eastern Europe, Caucasus and Central Asia (EECCA), introduced economic instruments for environmental policy in the early 1990s, at the time that they were still part of the Soviet Union. However, there is a major difference in the systems of economic instruments implemented in Western Europe compared to those introduced in EECCA. The former include mainly product taxes, such as energy taxes, as well as targeted emission taxes on selected pollutants, while the latter constitute a comprehensive and complex system of pollution charges[1] covering a very large number of air and water pollutants, plus solid waste generation. Other economic instruments for environmental protection, such as product taxes and deposit-refund systems are not commonly used in Russia.[2] In 2002, Russia's system of pollution charges was declared invalid by the country's Supreme Court due to its improper legal authorization (it was later reanimated by the Constitutional Court). A modified system is going to be re-authorized in the near future, and appropriate regulatory proposals are currently being considered by the Russian government.

1 The OECD distinguishes between pollution charges and taxes. The term "charge" is usually applied when the payments are requited, i.e., provided in return for a service. Unrequited payments are commonly referred to as "taxes." However, in Russia, a payment is only considered to be a tax if it is stipulated by the Tax Code, which is not currently the case with pollution payments. In order to conform with the accepted Russian terminology, this report uses the term "charge" to describe the instrument in question.

2 OECD, EAP Task Force, 2003b.

The objective of this report is to analyse the proposed changes to and prospects for further reform of the pollution charge system in Russia. The report draws upon the earlier work undertaken by the OECD on this subject. The OECD has conducted extensive analysis on pollution taxes in general and the reform of pollution charge systems in EECCA in particular. The EAP Task Force Secretariat housed by the OECD's Environment Directorate has conducted several reviews of the system of economic instruments for environmental protection in Russia and other EECCA countries and developed recommendations for how these instruments may be strengthened.

Chapter 2 describes and evaluates Russia's pollution charge system as it existed before 2002, discusses the rationale for the changes to the system that have been proposed by the government, and assesses the significance of these changes. Chapter 3 reviews specific recommendations for Russia and other EECCA countries developed by the EAP Task Force based on the international best practices and draws attention to the main differences with the Russian system. Opportunities for further improvements of the system of pollution charges are presented in Chapter 4 and include strengthening its incentive function as well as designing a motor fuel tax that could replace the current pollution charges for mobile sources and serve as a major source of environment-targeted revenue.

Annex A contains a case study that demonstrates a methodology for redesigning the Russian pollution charge system to increase its environmental effectiveness. It uses a modelling approach to design an illustrative pollution charge for air emissions of sulphur dioxide (SO_2) focusing on the power generation and ferrous and non-ferrous metallurgy sectors.

The final draft of this report was presented and discussed at an expert workshop in Moscow on 11 March 2004. The workshop was organised jointly by the OECD, the Russian Regional Environmental Centre, and the Russian Higher School of Economics and attended by representatives of the Russian federal government, Moscow environmental authorities, academic and research institutions, and NGOs (the list of participants is presented in Annex B).

2. ANALYSIS OF RUSSIA'S POLLUTION CHARGE SYSTEM

This chapter discusses specific features and main shortcomings of the pollution charge system in Russia between 1991 and 2002, when it was declared invalid by the Supreme Court. The assessment of the pollution charge system follows the OECD evaluation criteria for economic instruments, including environmental effectiveness, economic efficiency, dynamic efficiency, administrative costs, revenues, and "soft effects"(OECD, 2001).

2.1 Key Features of the Pollution Charges System

The Russian system of pollution charges has been described in detail in several OECD publications (notably, OECD, 2000 and OECD, 2003b). This section summarises its main features.

2.1.1 Coverage

Pollution charges in Russia are levied universally on all "nature users" (juridical or physical persons) that are subject to environmental permits. They are imposed for up to 214 air pollutants and 197 water pollutants, as well as on "placement" (storage and disposal) of four categories of hazardous waste (based on toxicity) and two categories of non-toxic solid waste.

Pollution charges for stationary sources are closely related to the comprehensive command-and-control regulation of environmental quality and pollution discharges. Permits granted by environmental authorities (individually for air emissions, wastewater effluents, and solid waste generation) define enterprise-specific emission limit values (ELVs) for all applicable regulated pollutants. The ELVs are determined, using computerised dispersion models, on the basis of environmental quality standards, so-called Maximum Allowable Concentrations (MACs)[3]. The MACs are set at levels that supposedly should cause neither immediate harm nor long-term negative effects on human health, making them in many cases more stringent than respective EU standards and WHO reference values.

The resulting ELVs are typically very stringent as well, far lower than the level of actual emissions from the enterprises. To ease the requirements imposed by such strict limits, which generally would not be realistically achievable, so-called Temporary ELVs (TELVs) were introduced as a transitory measure with a goal of step-by-step attainment of environmental quality standards. In practice, these temporary levels are set at values close to actual pollution levels, providing no incentive for pollution reduction (ELV compliance plans formally required as a condition for granting temporary limits are commonly ignored).

Among mobile sources, enterprise-owned transport vehicles are charged for air pollution. Private cars, the biggest contributors to air pollution in urban areas, were excluded from the system.

2.1.2 Charge Rates

A central feature of the pollution charge system is that a set of pollutant-specific basic rates apply to discharges within established limits, whereas a much higher rate applies to discharges exceeding the limits. The applicable rate of pollution charges is 5 times the base rate for quantities discharged in excess

[3] The approach for waste generation is different: the limits are set on the basis of actual process technology and raw materials used.

of the ELV but within the temporary limit. For discharges in excess of the TELV (or those without a permit), the applicable rate is 25 times the base rate. These multipliers represent the "non-compliance component" of the pollution charge. Regional authorities also have a right to apply "coefficients of environmental conditions"[4] to the rates to account for local environmental considerations.

Introduced in the early 1990s, the charge rates were set at the level that was believed sufficient to compensate for the economic damage resulting from environmental pollution. The estimates were made for a few pollutants and extrapolated for the rest of the regulated pollutants by using "conventional tonnes" [5]. The charges were payable quarterly on the basis of direct measurement (for very few substances) or indirect (mass balance, emission coefficient, etc.) estimation of pollutant discharges. The 1992 base rates for selected pollutants are presented in Table 2.1.

Table 2.1 Base Rates for Selected Air and Water Pollutants and Solid Waste, November 1992

	Base Rate 1992 RUR/tonne (USD/tonne)*	**Base Rate 2002** RUR/tonne (USD/tonne)
Air		
NO2	415 (1.04)	46.1 (1.5)
SO_2	330 (0.83)	36.6 (1.2)
CO	5 (0.01)	0.5 (0.02)
Non-toxic particulate matter	110 (0.28)	12.2 (0.4)
Water		
BOD total	730 (1.83)	81.0 (2.7)
Suspended solids	2,950 (7.4)	327.4 (10.9)
Phosphates (P)	11,090 (27.8)	1,231 (41.0)
DDT	221,750,000 (557,161)	24,614,250 (820,475)
Solid Waste		
Non-toxic mining waste	2.5 (0.006)	0.3 (0.01)
1st class hazardous waste (most toxic)	14,000 (35.2)	1,554 (51.8)
4th class hazardous waste (least toxic)	2,000 (5.0)	222 (7.4)

* The exchange rate of 398.2 RUR/USD is used for Q4 1992, and 30 RUR/USD for 2002.
Source: Ordinance of the Ministry of Natural Resources of 27.11.1992.

Even when pollution charges were introduced, the base rates were very low compared to the rates applied in Central and East European countries (for comparison, the rates of the SO_2 and NOx charges in Poland in 2000 were 85 €/tonne – REC, 2001).

Charge rates for mobile sources allowed two different approaches for their calculation: (1) based on the actual amount of fuel consumption (with differentiation for leaded and unleaded petrol); or (2) based on the type of motor vehicle. These charges were extremely low as well (e.g., less than 10 USD per car per year).

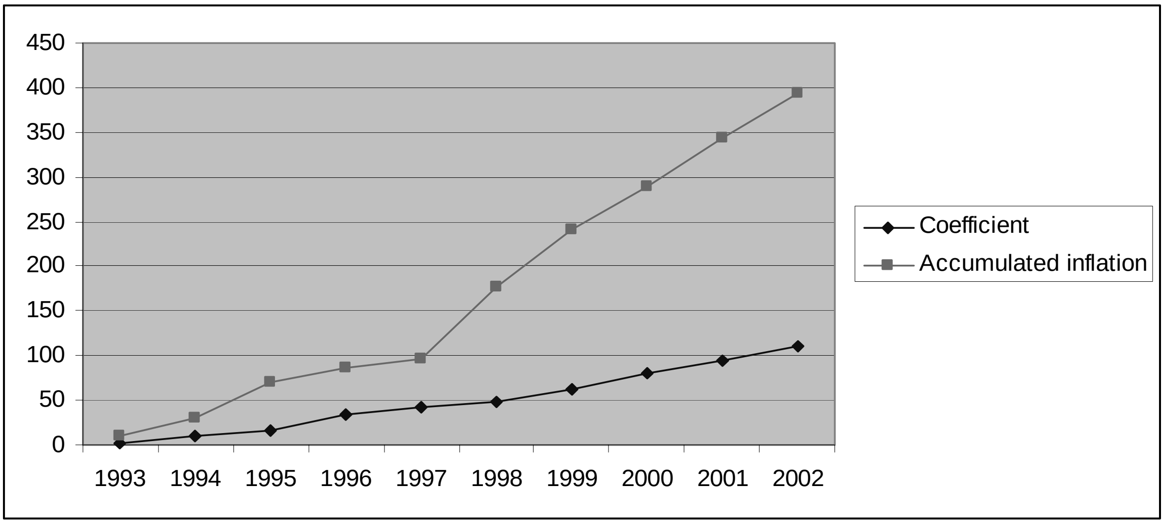
4 The coefficients of environmental conditions vary from 1.0 to 2.0 (by administrative region) for air pollutants, and from 1.0 to 1.7 (by river basin) for water pollutants. This coefficient can be further increased by 20% in big cities and by 100% in protected areas and environmental disaster zones.

5 "Conventional tons" are equivalent to an actual emission of a specific pollutant divided by the MAC of that pollutant.

The charges were further devaluated by high inflation over 1992-1998. Since 1993, a special cumulative inflation coefficient has been annually applied to the base rates introduced in 1992. In 2002, this coefficient equalled 111[6]. Figure 2.1 presenting this coefficient in comparison with the real inflation rate demonstrates that the real value of pollution charges has been constantly diminishing.

There are also problems with adequate computation of the charges: enterprises often provide their discharge information late to the environmental authorities and, in some cases, underreport their pollution. There is a lack of administrative control over the charge computation process: environmental authorities do not have resources to compare actual discharges with the numbers submitted by the enterprises as the charge base. This leads to underestimation of due payments and contributes to the poor collection of the revenue (see below).

Figure 2-1 Inflation Coefficient for Pollution Charges versus Real Inflation, 1992-2002



Source: Goskomstat, 2002

2.1.3 Revenue Collection

When the pollution charge system was established in Russia, the revenue collection was the responsibility of territorial bodies of the federal environmental agency, and the revenues were allocated between the federal budget (10%) and the federal, regional, and local environmental funds.

In 2000, the revenue collection responsibility was transferred to the federal tax authorities, while the federal and local environmental funds were abolished. The revenues were then divided between the general federal budget (19%) and the regional budgets (usually via an earmarked budget line).

Giving the collection powers to the tax authority has significantly increased the collection rates, although they remain rather low – from 60% to 80% (OECD, 2003a). Apart from the poor financial conditions of some enterprises (particularly heavy industries) causing defaults on the charges, the system is significantly undermined by the *lax enforcement against non-payment*. While the Russian legislation offers a number of strong enforcement tools for the collection of debt (OECD, 2002b), there is a general lack of application of these legal tools to appropriate cases. The main reasons for that are the lack of political will at a higher governmental level to take tough measures against economically and socially important enterprises; and unfamiliarity among tax and judicial authorities with the means of debt collection provided by recent Russian laws.

[6] The rouble was devalued by 1,000 in 1998, so for actual calculations the coefficient of 0.111 should be used.

The collection of pollution charges has also been impeded by the *excessive administrative discretion* given to regional environmental authorities in granting waivers and offsets of charge payments. Special exemptions were part of the design of the pollution charge system. For example, organisations which discharged wastewaters and/or disposed municipal solid waste (MSW) received from households, as well as organisations producing heat and/or electricity for households could be (and most often were) exempted from paying pollution charges. These included water supply and wastewater utilities ("vodokanals"), municipal solid waste management and district heating companies.

Additionally, the Russian government tried to create incentives for environmental investments, providing an opportunity to deduct expenditures on eligible environmental projects from pollution charge payments. The "Methodological Instructions on Pollution Charges" (1993) included a list comprising pollution prevention and end-of-pipe treatment projects, as well as environmental education and R&D initiatives. However, no environmental effectiveness criteria were stipulated, allowing almost any technological improvement to be claimed as an environmental investment, subject to approval by regional environmental authorities. In reality, the total amount of money available for offsets was usually planned at the beginning of the year, and then distributed according to some "priorities". The offsets were often granted to those enterprises that did not pay charges anyway, defeating the incentive purpose of the scheme and the pollution charge system as a whole. For example, in 1999, the pollution charge offsets in the Rostov oblast amounted to one-third of the total revenue collected (OECD, 2002b). After the transfer of the collection responsibilities to the tax authorities, the offsets were used less in recent years, and in some regions were eliminated altogether (e.g., in Rostov in 2001).

2.2 Evaluation of the Pollution Charge System (before 2002)

This section discusses the legal and institutional weaknesses of Russia's pollution charge system (that prompted its repeal in 2002) and uses the OECD evaluation criteria to assess its environmental and economic impact. While even in OECD countries such assessment is not an easy task (because of the difficulty of disentangling the impacts attributable to the different policy instruments addressing an environmental problem)[7], in Russia it is further complicated by the general lack of economic and environmental data.

2.2.1 Legal and Institutional Weaknesses

The recent legal challenge to the pollution charge system in Russia was caused by the deficiencies of its legal status and allocation of institutional responsibilities.

When introduced by a government decree in the early 1990s, pollution charges were not identified as a 'tax' but a 'charge' paid by polluters to compensate their negative impact on the environment. However, the new Tax Code promulgated in January 1999 referred to the charges as a new 'environmental tax'. The Ministry of Taxes and Fees (MoTF) thereafter officially defined[8] the pollution charges as a type of payment for natural resources. Since any payment for natural resources represents a federal tax in Russia, the pollution charge was consequently proclaimed a tax. Furthermore, the same was stated in a number of federal laws adopted afterwards[9].

---

7 A detailed evaluation analysis of environmental taxes and charges implemented in the different EU member states was recently carried out by ECOTEC for the European Commission and can be downloaded from the web page of the EC: http://europa.eu.int/comm/environment/enveco/taxation/environmental_taxes.htm.

8 In the MoTF letter "On payments for environmental pollution" BT-6-21/933 of 21.10.2001

9 For example, the Federal Law "On budgetary classification" (No. 115-FZ dated August 15, 1996, Annex 2) and the Federal Law "On federal budget for year 2002" both considered pollution charges as a federal tax.

This confusion resulted in a legal dispute at the Supreme Court of the Russian Federation in 2002 which almost resulted in a collapse of the system (see Box 1). Finally, following a Constitutional Court Decision, the system was reanimated. Nevertheless, the legal foundation of the existing system still contradicts Article 16 of the new Federal Law "On Environmental Protection" (2002) which stated that payments for negative impact on the environment (including pollution) must be established by federal law, and not by government decree. The elimination of this inconsistency and proper authorisation of the pollution charge system through a new federal law is currently a priority for the federal government.

Box 1. Temporary Repeal of Pollution Charges in Russia in 2002

In 2001, the "Kola Mining Metallurgical Company" appealed to the Supreme Court to invalidate the Government of Russia Decree No. 632 of 1992 that introduced the pollution charge system. The argument was very simple: the Tax Code of 1999 provides a definitive list of taxes and states that any tax that is not listed there, including pollution charges, is illegal. Moreover, according to the Tax Code, any new tax can only be introduced by Law, and not by a government decree or other implementing regulation.

In March 2002, the Supreme Court agreed with the argumentation of the "Kola Mining Metallurgical Company" and declared Decree No. 632 (and, therefore, the pollution charge system itself) null and void[10]. Since then many polluters have stopped their payments. In the meantime, the Constitutional Court of the Russian Federation in its Decision of 10.12.2002 recognised a pollution charge not to be a tax but a charge compensating for negative impact on the environment, which is not covered by the Tax Code and, therefore, could be introduced by the Government. This Decision reinstated the legal foundation of the pollution charge system.

2.2.2 Environmental Effectiveness

The levels of air and water pollution discharges in Russia have decreased significantly since 1990 (see Table 2.2). However, practically the entire reduction can be attributed to the decline of industrial activity[11]. Toxic waste generation doubled between 1990 and 2001 (even though part of this statistical increase can be explained by changes in the hazardous waste reporting system in the late 1990s that started to cover more waste generators). Russia's State Council[12] admitted in June 2003 that the growth rates of emissions from transport and waste generation are exceeding the production growth rates.

Table 2.2 GDP and Pollution Dynamics in Russia over 1990-2001 (percentage of the 1990 level)

	1990	**1995**	**1997**	**1999**	**2001**
Real GDP	100	62	60	62	70
Industrial output	100	50	49	51	60
Air pollution from stationary sources	100	62.5	56.6	54.3	56.0
Wastewater discharges	100	91.7	82.7	74.5	71.2
Hazardous waste generation	100	123.6	132.4	160.2	206.2

Source: Goskomstat, 2000, 2003

10 Interesting to note is the fact that representatives of the Government confirmed in the Court that pollution charge was classified as a federal tax, despite the fact that it was not introduced by a federal law. At the same time, pollution charges do possess all the characteristics of a federal tax, i.e., 'an object of taxation, a tax base, period, and rate, and procedures for calculation and payment of the tax' (Ernst & Young, 2002, p. 3).

11 In fact, the requirement that industrial facilities pay tax or rent (depending on the ownership) for the "sanitary protection zone" that surrounds the facility and that is a function of its air pollution may provide a bigger incentive to reduce air pollution (and, therefore, the size of that zone) than the pollution charge itself. The land tax/rent rates in Russia are rather high.

12 The State Council is an advisory body to the President of Russia.

One objective for an economic instrument is to promote changes in environmental behaviour by providing incentives that reward improvements in environmental performance. The environmental effectiveness of an economic instrument is the extent to which it achieves this objective. Pollution charges aim to increase the costs of discharging polluting substances into the environment and should provide a direct incentive for polluters to reduce such discharges. There are several reasons why Russia's pollution charge system has failed to provide such incentives.

- The lack of focus on principal pollutants undermines the system's effectiveness. With the charge base of hundreds of pollutants, the system does not reflect any policy objectives or priority pollution problems (which is a deficiency of Russia's environmental policy development in general). The charges for air pollution from mobile sources exclude private vehicles, the biggest source of such pollution. The pollution charges on waste storage and disposal provide no incentive for waste minimisation. In the absence of enforceable waste management regulations, such charges, at worst, encourage illegal dumping of waste, and at best, its on-site storage (under the old system, charges for waste stored on-site were 30% of those applicable to waste disposed at a landfill).

- The charge rates eroded by inflation are so low compared to marginal abatement costs that the system provides very little incentive for reducing the level of pollution. Even though there is some sporadic evidence of the incentive impact of the non-compliance component of the pollution charges (OECD, 2003b), there is no noticeable overall effect. The current base rate of €1 per tonne of SO_2 emissions, even if multiplied by 25 for emissions in excess of TELV, is much lower that the marginal cost of reducing a tonne of SO_2 (the cheapest technology costs about €100 per tonne13).

- The fact that discharges typically are estimated and not measured further diminishes the incentive impact. Discharge estimates based on inputs and technology characteristics (often with respect to the original design rather than current performance) provide no direct link between the actual pollution reduction and the reduction in pollution charge liability, thereby not giving a financial reward for making environmental management improvements.

- Lenient enforcement and loopholes in the implementation of the pollution charges hampers their incentive function. The existence of an option to negotiate a "better deal" with environmental authorities encourages polluters to shift focus from pollution prevention and control to attempting to gain exemptions, offsets, or other privileges (so-called "rent-seeking"). Weak enforcement of payments counteracts their purpose altogether.

2.2.3 Economic Efficiency

In theory, environmentally-related taxes/charges exploit different opportunities for pollution abatement by creating incentives for those firms (or economic sectors) with the lowest abatement costs to undertake most abatement, resulting in an efficient, cost-minimising pattern of pollution reduction.

It is clear that pollution charges in Russia do not lead to equalising abatement costs across pollution sources for two main reasons: (a) rates are too low compared to marginal abatement costs of any significant emission reduction; and (b) environmental authorities have excessive discretion in manipulating total charge liabilities (offsets, local coefficients, exemptions, and verification of discharges).

---

13 TME, 1999.

2.2.4 Dynamic Efficiency

Economic instruments should be evaluated in a dynamic context because they can create some incentives for technological innovations and introduction of cleaner technologies, for enterprises to achieve abatement at a lower cost. Because the incentive impact of pollution charges in Russia is negligible, so is its dynamic efficiency. Where pollution reduction is indeed stimulated by the charges, the solution most often is end-of-pipe treatment. There are cases of process technology improvements as well, even though they usually stop short of innovation and are undertaken for economic reasons. For example, many aluminium smelters in Russia found it economically feasible to replace old wet scrubbers with dry scrubbers that provide better treatment of flue gas.

2.2.5 Administrative Costs

It is important to design environmentally-related taxes or charges to achieve environmental and revenue objectives while minimising the administrative costs of operating the tax.

The Russian pollution charge system is administratively complex due to its coverage of a great number of pollution sources and pollutants subject to different rates, the possibility of granting individual exemptions, and difficulties with verification of the chargeable emissions or waste volumes.

The accuracy of charge assessments is a big problem in Russia because of the high administrative costs of the system, unaffordable given the resource constraints of environmental agencies. Environmental inspectors often conduct joint inspections with the tax authorities (responsible for pollution charge collection) but, owing to staff shortages, they are able to cover only a fraction of the enterprises. During such inspections, tax inspectors review only financial documents, while environmental inspectors try to verify the measurement or calculation of actual discharges against the numbers submitted by the enterprise as the charge base. (Measurement of most chargeable pollutants is technically and financially impossible.) Even these limited inspections often discover discrepancies that point to the apparent desire of some enterprises to “hide” a portion of their discharges. This confirms the larger problem that the pollution charge system is too complex and unfocused to be implemented effectively.

2.2.6 Revenues

The Russian system of pollution charges is motivated in large part by the need to raise revenues for environmental protection projects. The actual design of the Russian system contradicts the genuine reason for introducing pollution charges, namely, to provide incentives for pollution abatement. The only real outcome so far has been the generation of some revenues, and even those have been modest due to the low charge rates and collection deficiencies (see Table 2.3).

Table 2.3 Pollution Charge Revenues in Russia in 2001, billion RUR[14]

Medium	Total Revenue	Revenue from Charges for Exceedance of Temporary ELVs
Water	2.6	0.7
Air	2.0	1.1
Waste generation	3.0	0.3[15]
Total	**7.6**	**2.1**

Source: Environmental Protection in the Russian Federation: Statistical Review, Goskomstat, 2002

The revenues from pollution charges increased in 1995-1998 from 1.6 billion RUR to around 2.9 billion RUR and doubled in the following three years to more than 7.6 billion RUR in nominal value. In real terms, the pollution charge revenues increased slightly between 1995 and 2001 (see Table 2.4).

Table 2.4 Dynamics of Pollution Charge Revenues, 1995-2001

	Industry Producer Price Index (Dec 2000 =100)	Revenues of pollution charges (million RUR in current prices)	Revenues of pollution charges (million RUR in 2000 prices)
1995	27.3	1,549	5,675
1996	34.3	1,6457	4,795
1997	36.9	1,945	5,271
1998	45.4	2,856	6,290
2001	110.7	7,600	6,865

Source: RECEP, 2002; OECD, 2003b

However, the situation looks differently when the revenue figures are set in relation to the overall economic development in Russia. Table 2.5 reveals that the share of revenues from pollution charges to GDP and to the consolidated budget declined between 1995 and 2001.

Table 2.5 Russia's Pollution Charge Revenues versus GDP and Public Revenues

	1995	**1998**	**2001**
Revenue pollution charges (billion RUR)	1.55	2.86	7.6
GDP (billion RUR)	1541	2741	9063
Consolidated budget (billion RUR)	408	625	2674
Revenue pollution charges of GDP (%)	0.10	0.10	0.08
Revenue pollution charges of consolidated budget (%)	0.38	0.46	0.28
Revenue pollution charges (million USD)	337	291	260

Source: OECD, 2003b; OECD, 2000; RECEP, 2002.

Table 2.6 illustrates the contribution of pollution charge revenues in financing environmental projects. Although 81% of the pollution charge revenues were earmarked for environmental expenditures (through environmental funds), their contribution to the total environmental expenditures amounted only to some 5.5% in 2001. In relation to new environmental capital investments (the originally planned earmarking target for pollution charge revenues), the contribution of pollution charges seems to be much more substantial – about 30%. Another important function of the charge revenues has been to support the

[14] For 2001, 1 USD = 29 RUR (approximate average value).

[15] For waste generation – above the approved limit value (temporary limits are not applicable).

operations of environmental regulatory agencies, particularly at the regional and local levels, compensating for chronic shortages in budgetary funding.

Table 2.6 Environmental Expenditures in Russia in 2001, billion RUR

Total environmental expenditures	138.9
of which:	
Current expenditures	99.7
New capital investments	27.7
Expenditures on capital repair of environmental fixed assets	11.5

Source: Environmental Protection in the Russian Federation: Statistical Review, Goskomstat, 2002

2.2.7 "Soft Effects"

This evaluation criterion relates to the instrument's general impact on the economy and consumer behaviour. In Russia, a substantial portion of the environmental funds' resources has been spent on preparation of environmental programmes and reports on the state of the environment, conducting environmental impact assessment of projects, environmental education and publications, and public awareness campaigns. One positive result from those actions was that industry and the public became better informed about environmental problems and their causes, as well as solutions available to address them, thereby contributing to stakeholder dialogue and public participation.

2.3 Assessment of the Proposed Changes to the Pollution Charge System

The urgency for a reauthorisation of the pollution charge system was recognised after the legal dispute of 2002 about the legality of Decree No. 632 (1992). The low environmental effectiveness of the existing system was another factor, but not the main one.

Since 2002, the Government of Russia has been working on a draft Federal Law "On Payments for Negative Impact on the Environment" intended to replace Decree No. 632. There have been more than a dozen drafts prepared by the Ministry of Natural Resources, Ministry of Economic Development and Trade, the State Duma Committee on Ecology, and other political actors. The main objective of the latest draft Law (dated September 25, 2003) is to better institutionalise the pollution charge system (see Table 2.7) by making it consistent with the existing regulatory framework.

Table 2.7 Proposed Changes to the Legal Status of the Pollution Charge System

Issue	Proposed Changes
Legal status of the regulatory act	The reauthorisation would be through a Federal Law (a higher legal status than a government decree), as required by the Federal Law "On Environmental Protection" (2002).
Legal status of pollution charges	The draft Law states, in line with the argumentation of the Constitutional Court, that pollution charges are not a tax (in the definition of the 1999 Tax Code) but a charge paid by polluters to compensate for their negative impact on the environment.

Source: Draft Federal Law "On Payments for Negative Impact on the Environment" (25.09.2003)

There are several positive changes in the draft Law, compared to the old Decree No. 632:

- The draft law sets minimum thresholds of annual environmental impact below which polluters are not liable to pay charges. Those thresholds are expressed in pollution loading per year and are 100 “conventional tonnes” (physical tonnes divided by the relevant MAC) for all discharged air and water pollutants16, 0.5 t for hazardous waste of 1st class toxicity, 3 t for 2nd class hazardous waste, 15 t for 3rd class, and 100 t for 4th class. This is a first attempt to limit the coverage of the pollution charge system in Russia, even though the thresholds are set too low to simplify the system significantly.

- The draft law establishes a different scheme for offsets in the form of rebates of pollution charge payments for investments in technical renovation and environmental measures. It requires a formal agreement of 1 to 7-year duration between the competent environmental authority and the enterprise before any investment is undertaken (the old scheme allowed ex post offsets under vague criteria). The agreement must define the measures to be carried out (a list of eligible measures is attached to the draft law), their costs, and quantitative environmental improvements (e.g., reduction of pollution discharges). The rebate may be effectuated only if and when the target improvements have been achieved and cannot exceed 70% of the total amount of charge payments due. In addition, the rebate may not cover more than 70% of the total investment cost under the agreement. These changes represent an important step forward in closing the loopholes that led to abuse of discretion and corruption under the old system of offsets.

- The draft law significantly strengthens the enforcement of pollution charge payments. It stipulates a clear payment procedure and sanctions for non-payment and inaccurate reporting of liable pollution discharges, including debt collection instruments (attachment of a bank account and/or property through a court injunction), environmental permit revocation, and administrative fines.

However, the most important conceptual features of the pollution charge system proposed for reauthorisation (the number of pollutants covered and the principle of calculating charge rates) would be **the same as in the existing system**, as described in Section 2.1.

The charge base remains the same as in existing system (air emissions, water effluents, and waste storage/disposal) and may even be expanded in the future to include noise and electromagnetic pollution. The draft Law does not contain a list of pollutants it would cover but rather refers to applicable government regulations (to be adopted) and individual permits, keeping the old “universal” system.

The September 2003 draft Law does not set specific charge rates but refers to an implementing government regulation to be promulgated at a later date. An earlier draft (dated March 2003) did propose a few marginal changes with respect to the rates and the methodology applicable to determine the charges for mobile sources. It is expected that the rates measured in USD would be increased somewhat compared to the rates applied in 1993-2002. For example, using the rates proposed in the March 2003 draft, the SO_2 charge rate for a stationary source in Krasnoyarsk would grow from $1.65 per tonne in 2002 to $2.77 in 2004. Such increases may result in larger revenues generated by the pollution charges but would still be too small to have an incentive impact on pollution reduction.

The rules for covering mobile sources remain unclear. While the March 2003 draft set rates for air emissions from mobile sources based on vehicle type, the later June 2003 draft proposed a charge based on the mass of motor fuel used. However, all the drafts to-date would still not cover private vehicles.

[16] It is impossible to determine the general thresholds for individual pollutants because any source always discharges several pollutants. For illustration purposes only, if a source were emitting *only* SO2, the threshold would be 50 tons per year.

The September 2003 draft Law changes the revenue distribution between federal, regional and local budgets to 20%, 40%, and 40%, respectively, reinstating the allocation of part of the revenue to the local budgets. The draft law does not provide for earmarking of revenues for environmental purposes.

Shortly after the final draft of this report was completed in February 2004, a new draft Concept of the Law "On Payments for Negative Impact on the Environment" was issued by the Ministry of Economic Development and Trade and the Ministry of Natural Resources. It proposed, among others, to limit the charge base to pollution discharges in excess of ELVs, which would effectively turn a charge into a non-compliance fee. This particular change, if adopted, would alter the fundamental logic of the current pollution charge system, where polluters must pay for any negative environmental impact they cause.

The most recent (February 2004) Terms of Reference for the preparation of a new draft Law set the date of November 1, 2004 as a deadline for its completion. The Law is expected to be enacted in 2005.

In summary, the latest drafts and concept of the Law offer no significant changes to the existing system that could improve its environmental effectiveness. The revised system would also remain economically and administratively inefficient, as described in Section 2.2 in accordance with the OECD criteria. In its proposals, the Russian government did not take into account many findings and recommendations of reports published by different international institutions, as well as other Russian and international experts. The following chapter compares the Russian system with such recommendations based on international best practices.

3. RECOMMENDATIONS FOR REFORMING RUSSIA'S POLLUTION CHARGE SYSTEM BASED ON INTERNATIONAL BEST PRACTICES

Pollution taxes/charges levied on the quantity of pollution released into the environment can have two broad purposes, defining two general types of this instrument:

- incentive taxes/charges, which are levied with the objective of changing environmentally damaging behaviour without the primary intention to raise revenues for the government (in fact, the revenues from a fixed-rate tax inevitably fall if the tax is effective and the tax base decreases); and

- revenue-raising taxes/charges, which may influence behaviour but still yield substantial revenues, exceeding those necessary to administer the tax/charge itself.

Incentive pollution charges can be "optimal" and regulate emission levels of individual polluters purely through market forces, without mandatory emission limit values (ELVs), thereby resulting in achievement of a predefined emission target with an economically optimal allocation of emissions among polluters. However, such taxes can rarely be implemented in practice even in developed market economies because the regulator usually seeks to protect public health and the environment against local negative impacts from pollution through individual permits. Alternatively, incentive taxes/charges can be introduced simply for the purpose of motivating emission reduction to comply with the permitted ELV. Even to achieve this limited incentive impact, polluters should be sensitive to production cost changes represented by the pollution charge, the rate of the charge should be high enough to make regulatory compliance cost-effective, and emission monitoring and payment enforcement should be strong.

Pollution taxes or charges can raise revenues for targeted environmental programmes. For a revenue-raising pollution charge to be successful, there should be a fairly stable charge base to provide a predictable revenue stream; the charge burden should either be widely distributed or fall on the part of the regulated community that benefits most from the revenue disbursement; and the administrative costs must be kept low. Since these conditions are difficult to meet in a pollution charge system, particularly one that covers many pollutants, it is generally considered in OECD countries not to be an effective source of targeted revenues.

In practice, pollution taxes/charges are always designed as part of a mix of environmental policy instruments. As the OECD points out, "the design and implementation of environmentally related taxation is likely to differ from simple text book discussion"[17]. However, no matter what the purpose is for introducing and revising a pollution charge system, it should be designed to achieve specific environmental policy objectives. In order to increase the effectiveness of a pollution charge, two main questions need to be answered: (1) whether the pollution charge is the best policy instrument to achieve the environmental policy objective; and (2) what other policy tools and institutions need to be in place for the pollution charge to function for the intended purpose.

[17] OECD, 2001, p. 24.

The analysis of the current Russian pollution charge system as well as the proposed changes highlights some fundamental deficiencies regarding its effectiveness. Many of the same shortcomings are found across the EECCA region. The reform of pollution charges was identified as one of the priorities under Objective 1 (Improve environmental legislation, policies, and institutional framework) of the EECCA Environment Strategy[18] adopted by Environment Ministers at the "Environment for Europe" conference in Kiev in May 2003. The Strategy envisioned to:

- review the number of pollutants subject to charges;
- increase the charge rates to a level that would provide incentives to reduce pollution; and
- increase the collection rates.

These reforms have long been advocated by international experts, including the EAP Task Force Secretariat at the OECD. The following sections summarise these recommendations and compare them to the current situation in Russia.

3.1 Reduction of the Number of Chargeable Pollutants

One of the main reform recommendations is to radically reduce the number of pollutants which pollution charges are imposed on. The charge should be levied only on a limited number of major priority pollutants that can be monitored at reasonable costs.

This recommendation is backed up by international best practices. In Western European countries where air emission taxes exist (Sweden, Denmark, France, Italy, and Spain), they are limited to SO_2 and NOx (in Denmark – to SO_2 only) and just to large combustion plants (REC, 2001). Moreover, most SO_2 taxes are actually levied on the sulphur content of the fuel used[19], further reducing the administrative costs of the system. The same is true for effluent taxes in OECD countries – the tax base consists of only a handful of different pollutants. For example, only three substances, nitrogen, phosphorus and organic substances, are the base of the Danish sewage tax, compared to the situation in Russia where charges are defined for some 200 different water pollutants. The difference is particularly startling considering that the administrative capacity is generally much higher in countries of Western Europe than in Russia.

Several directions have been recommended to reduce the charge base in EECCA countries[20]:

- Exclusion of hazardous air and water pollutants from the charge system. Toxic substances such as heavy metals, phenols, etc. should be strictly regulated through permits based on technology considerations and regularly monitored. Any accidental releases of such pollutants are likely to cause significant damage to human health and the environment and should be prosecuted through a full range of enforcement responses and liability provisions. Pollution charges for hazardous pollutants play virtually no incentive role that would complement command-and-control regulation and, due to the large number of such pollutants, overly complicate the administration of the system.

---

18 UNECE, 2003, p. 4.

19 In some countries (e.g., in Norway), the tax on the sulphur content of fuel is combined with the possibility for polluters to claim a refund if they can prove that they have "cleaned" some of the emissions that otherwise would have occurred.

20 OECD, 2003a.

- Replacement of pollution charges on industrial waste with user fees for waste management services. The permitted limits for industrial waste generation in EECCA are based on actual technologies and practices, so the charges do not provide any incentive for waste minimization. The revenues from pollution charges on waste generation are not earmarked for the development of waste management facilities, as is usually the case in OECD countries where such charges are used. This, in combination with a weak command-and-control regulation for hazardous waste management, results in inappropriate disposal practices (including on-site storage). While developing a comprehensive industrial waste regulatory framework, Russia should consider eliminating or phasing out pollution charges for industrial hazardous and solid waste and allow providers of waste collection, transport, storage, treatment, and disposal services to charge enterprises directly for these services in order to recover the full costs of safe management of the wastes.

The determination of pollutants that would continue to be charged should be guided by an analysis of main environmental problems. In order to have an incentive impact, pollution charges must be targeted at a few key pollutants (that represent priorities of the government's environmental management programme) that are discharged mainly by a number of big stationary point sources. For example, a sulphur dioxide pollution problem, when the major polluters are power plants and a few industrial facilities, can be effectively addressed by a pollution charge. If major contributors to the problems are numerous small sources, pollution charges are not a good policy tool.

The current reform of pollution charges in Russia pays no attention to these recommendations, maintaining the principle of charging for every regulated pollutant. In the latest draft Law, there is an attempt to exclude the smallest pollution sources from the system (see Section 2.3), but the thresholds of environmental impact are set too low to streamline the system in a meaningful way.

3.2 Coverage of Mobile Sources

The pollution charges system currently in place in Russia does not tackle the problem of mobile pollution sources in a consistent way. For example, transport-related emissions from private vehicles are not included in the current pollution charge system and the draft Law – how it stands at the moment – will not include them either, even as the private car ownership is rising sharply.

Furthermore, the use of pollution charges for mobile sources is not in line with international practice. Product taxes are a much more effective tool for tackling this environmental problem. Most OECD countries practise some form of differentiation of the tax rates for motor fuels based on environmental criteria, such as their content of lead (used in all OECD countries where leaded petrol is not yet banned completely), benzene, and sulphur. Apart from raising revenues, these product taxes with differentiated rates provide incentives to consume environmentally-friendlier transport fuels. Furthermore, the costs of administering a motor fuel tax in OECD countries is low because the tax is added to the price of fuel (and collected together with excise taxes) rather than paid by individual consumers, as it is done with pollution charges for mobile sources in Russia.

3.3 Increasing Pollution Charge Rates

Russia's current low rates cannot fulfil any of the two functions associated with pollution charges. The Russian levels of the different pollution charges are often even lower than comparable levels in other EECCA countries (OECD, 2003b) and in CEECs (REC, 2001). For example, the charge rate of USD 2.77 per tonne of SO_2 proposed to be implemented under the current proposal in Russia in 2004 would amount to less than 10% of the rates applied in Belarus, Georgia, Moldova and Kazakhstan in 2001, and to some 0.2% of the rates applied in Denmark and Sweden (OECD, 2003b).

The EAP Task Force recommendations for EECCA countries focused on the need for the pollution charges on priority pollutants (that will constitute the charge base after it is drastically reduced) to provide significant incentives to reduce pollution. Establishing ***flat rates***, the same below and above ELVs, would help provide a continuous incentive for pollution reduction even beyond compliance with the permitted limit as long as it is economically feasible. (The temporary ELVs that currently exist in Russia and represent an additional "threshold" for the rates should be eliminated as part of improving the environmental permitting system.) The flat rate would also take away the discretion of regional authorities that would no longer be able to increase or reduce the enterprises' charge burden by setting lower or higher ELVs, respectively. This does not mean that mandatory ELVs would be abolished altogether. As illustrated by the Norwegian SO_2 tax experience,[21] these two instruments may be compatible as they perform different functions within a regulatory programme.

3.4 Reduction of Discretionary Powers of Implementing Agencies

It is important that discretionary powers of regional and local environmental agencies implementing the charges be limited. Any exemptions and reductions that may be used should be transparent to all and applied in an identical and foreseeable manner by all environmental agencies in the country. The first steps in this direction have already been undertaken in Russia when the responsibility for collecting revenues was transferred from environmental to tax authorities. The shift in responsibility was accompanied by an increase in the rates actually collected[22]. Even though the September 2003 draft Law substantially improves the procedure for offsets, environmental authorities would still have the right to determine the actual charge payments by setting the temporary discharge limits.

Special tax treatment for some economic actors is not uncommon in OECD countries. The rationale for introducing such tax exemptions or reductions is to offset potential negative impacts from implementing the economic instrument. The main reasons for granting tax exemption in OECD countries are the fear of loss of competitiveness and avoidance of any negative equity implications of environmental taxes on private households[23]. Although in OECD countries tax exemptions or reductions may reduce the effectiveness of the instrument and the revenues generated, they are nonetheless set in the law and apply equally to all economic actors, usually with no discretion given to the authorities, thereby avoiding corruption.

---

21 Frøyen 1997, p.87.

22 It is not certain that the collection rate improved only due to that shift: Russia's tax collection in general was quite poor in 1993-1997 and substantially improved in 1999-2002 in line with the economic recovery and improvement of financial health of enterprises, growing monetisation and phasing out barter and other non-monetary transactions in the Russian economy.

23 See for a detailed discussion: OECD, 2001, Chapters 4 and 5; and OECD, 2003c.

Some OECD countries (e.g., the UK) combine such tax privileges with voluntary agreements: temporary tax exemptions are given to economic actors with the condition of achieving clearly defined targets laid down in voluntary agreements, such as increased energy efficiency in the tax-exempt economic sectors. Again, the essential condition for such arrangements is a fully functioning enforcement and monitoring mechanism which is currently not in place in Russia.

In addition, financial incentives to induce enterprises to undertake environmental improvements should be limited to those facilities that demonstrate good faith by paying their pollution charges, and to those projects that are defined as priorities by the government.

4. OPPORTUNITIES AND CONSTRAINTS FOR FURTHER IMPROVEMENTS

The revisions of the pollution charge system in Russia proposed in the September 2003 draft Law are not a significant step in the direction of strengthening the incentive function of this instrument; nor are they in line with the recommendations of international organisations. Some legal issues may be clarified in the draft Law, but the main shortfalls of the system, from both environmental and fiscal perspectives, will remain.

While pollution charges in Russia are declared to have an incentive function, their real motivation is revenue raising. As already mentioned, an administratively complex pollution charge system like Russia's is not an effective source of revenues. A broad-based product tax such as a motor fuel tax would not only help the government create a stable flow of revenues for environmental programmes but also, by replacing pollution charges for mobile sources, provide an additional price incentive for more efficient fuel use in the transport sector. At the same time, the pollution charge system should be streamlined so as to reduce the burden on the administrative system and address those important environmental issues (priority pollutants and/or sources), where using charges would be relevant and superior to using only command-and-control instruments[24].

This chapter discusses these two principal directions for continued reform of the pollution charge system – streamlining the system for incentive purposes and introducing a motor fuel tax for revenue-raising purposes – pointing out the challenges in pursuing them.

4.1 Streamlining the Pollution Charge System

Real improvement in the environmental effectiveness of the system could be achieved undertaking the following steps:

- reduction of the number of pollutants on which charges are levied;
- increase in the charge rates; and
- improvements in the administration of the pollution charge system.

The number of pollutants subject to charge payments should be reduced to a small number of priority air and water pollutants. The identification of priority pollutants should occur on the basis of clearly defined environmental policy objectives. For example, for air pollution, charges could target a reduction of SO_2, NO_x, particulates, and some VOC emissions by the main emitting economic sectors, contributing a large share of the total emissions. The same approach could be applied for releases of pollutants into water, focusing on a small number of pollutants, such as organic matter (expressed in BOD and/or COD), suspended solids, phosphorus, nitrogen, and possibly some heavy metals.

[24] Revenues from incentive-oriented pollution charges and/or a motor fuel tax could be used to offset more economically "distortionary" taxes (e.g., on labour and capital) in order to achieve a so-called "double dividend". Such revenue-neutral tax shift (often referred to in OECD countries as "green tax reform") is worth exploring in Russia.

During the selection process, an important consideration should be that chargeable pollutants – apart from being priority pollutants – be measurable at reasonable costs and emitted by a relatively small number of big stationary sources. Most hazardous substances should be subject to strict technique-based command-and-control regulation, with severe penalties for violation of environmental permits and damage compensation liability for accidental releases of such pollutants.

For the pollutants that will be covered by pollution charges after the charge base is reduced, an analysis should be undertaken to determine typical charge burdens and pollution abatement costs for enterprises by sector and size. It is then necessary to estimate the degree to which the charge rates can be increased (at the same time as the number of pollutants subject to charge is drastically reduced), so as to enhance their incentive impact while maintaining the charges' economic feasibility and political acceptability. The economic feasibility means that polluters (particularly in the public sector) should have access to financial sources to reduce their emissions in response to the charge. If this condition is not met (as in the case of municipal water/wastewater utilities that are practically insolvent), some interim solutions are possible such as planned gradual increase of pollution charge rates along with management improvements in the sector. Some economic sectors may be exempt from a pollution charge for a certain pollutant, if their contribution to the total volume of discharge of that pollutant is insignificant and the discharge sources are small and/or difficult to control (in those cases, pure command-and-control regulation is preferable).

As mentioned in Section 3.3, pollution charge rates should not depend on the setting of emission limit values (ELVs) for individual installations and be the same per unit of pollution no matter what the total load is. This will increase the overall incentive impact of the charges and limit administrative discretion in applying them, while keeping ELV requirements in permits for the pollutants in question as safeguards against the worsening of local pollution problems. At the same time, the higher rates should be announced early but introduced gradually in order to soften the immediate cost effect on industry and give enterprises time to assess abatement costs versus paying the pollution charges and adjust their investment plans.

As a result of this streamlining process, the burden of controlling and enforcing pollution charge payments would decline because of the reduction of the number of pollutants and liable installations. This should lead to improvements in the collection efficiency. At the same time, enforcement of payments should be strengthened by using a combination of available tax collection tools, environmental permit suspension as a last resort option, and administrative sanctions, as already envisioned in the September 2003 draft Law.

Although there is a consensus among experts in Russia that the number of pollutants subject to charges should be reduced, there may also be political resistance to this change because of the effect on revenues coupled with difficulties in obtaining parliamentary support for higher charge rates to compensate for the loss of revenue. This is an additional reason why the process of reducing the charge base should be tied together with the revision of charge rates.

Another possible argument against the reduction of the pollution charge base is that it would undermine the already weak system of industrial self-monitoring, i.e., that enterprises would not report on pollutants other than those subject to the charge. However, currently, the reporting of emissions for charge assessment purposes is seldom based on actual monitoring and often falsified or simply inaccurate, which is particularly difficult to control under the present complex system. Moreover, self-monitoring should become a mandatory permit condition as part of a broader permitting reform, irrespectively of the charge system improvements.

Another issue that may have an impact on the incentive impact of pollution charges in Russia is that some Russian industrial enterprises still operate under so-called "soft budget constraints," when economic losses of such enterprises are subsidised by the state. The subsidised enterprises operate without incentives for technology and management improvements, and the incentive effect of a pollution charge is reduced.

The occurrence and importance of such subsidies are diminishing in Russia, but it is still an issue that needs to be addressed to make the reformed pollution charges environmentally effective.

4.2 Introducing a Motor Fuel Tax

There are several reasons to introduce an environmentally earmarked motor fuel tax in Russia:

1. *Replacing the ill-advised and rather complex charge scheme for air emissions from mobile sources.* The motor fuel tax would cover all motor vehicles and not only those owned by 'legal entities and individual entrepreneurs' (as defined in the draft Law) that are liable for pollution charge under the current system. The motor fuel tax would also be fairer since it is the actual use of vehicles, as reflected in fuel consumption, that is taxed and not their ownership.

2. *Generating revenues for environmental projects.* International studies demonstrate the significance of motor fuel taxes in terms of generating revenues. In OECD countries, the transport sector, through taxes on petrol, diesel fuel and motor vehicles, accounted in 1995 for roughly 90% of total environmentally related tax revenues[25]. The motor fuel tax revenues could be earmarked to support environmental investments and administrative costs of environmental agencies.

In addition, the design of this tax could follow international practice by differentiating the tax rates based on environmental characteristics with the aim of encouraging a changeover to more environmentally friendly transport fuels. One of the best examples of this approach is Sweden: the tax on diesel is differentiated between three rates which are linked to the fuel's sulphur and benzene content: the cleaner the fuel, the lower the tax rate (Nyström and Berqvist, 1997). Another example is the situation in the UK, where two different tax rates apply to diesel fuel depending on the sulphur content. The tax differentiation is attractive because it provides an incentive for consumers to use (and for refineries to produce) more environmentally friendly fuels and simultaneously generates revenues. As a result of the differentiated tax in the UK, the market share of diesel with low sulphur content increased much faster than expected.

A further advantage of introducing a motor fuel tax is that *it would use the already existing fiscal mechanism and be levied as part of the current excise taxes on petrol and diesel* (by increasing the excise tax rates by the amount of the motor fuel tax)[26]. This would imply low administration costs because of the limited number of tax imposition points (in Russia, excise taxes on motor fuel are usually paid by oil refineries). The simple and efficient form of collecting tax revenues would be an important advantage for such an approach.

The current Russian system of taxes levied on transport fuel includes:

- the excise tax (a federal tax); and
- the VAT (at 20%, goes to the federal budget).

The excise tax is an *ad quantum* tax, as is common in the international practice, and covers in Russia, among other products, two categories of petrol (below and above the octane number of 80) and diesel. The dynamics of the rates of this tax for 2001-2003 is presented in Table 4.1 below.

---

25 OECD, 2001, p. 55.

26 Although the Russian oil market has undergone considerable liberalisations since 1992, major distortions persist in petrol and diesel pricing (in 2000, the Russian petrol and diesel prices were about 60% of the international prices). However, the proposed motor fuel tax would be too small to have a tangible impact on the fuel prices.

Table 4.1 Excise Tax Rates for Petrol and Diesel in Russia (2001-2003)

Fuel Type	**Excise Tax Rate, RUR (USD) per tonne**			**Increase 2001-2003, %**
	2001	2002	2003	
Petrol below 80 octane	1,350 (44.8)	1,512 (47.6)	2,190 (70.4)	62
Petrol above 80 octane	1,850 (61.4)	2,072 (65.2)	3,000 (96.5)	62
Diesel	550 (18.2)	616 (19.4)	890 (28.6)	62

Source: IMF, 2002 and Ernst & Young, 2003

The sharp increase of the rates in 2003 was to compensate for the elimination of the 4% ad valorem road users tax. The excise fuel tax collection was reported to be rather high at about 85% for petrol and 90% for diesel (IT&IC, 2002) compared to the collection rate of pollution charges of about 80% after the collection responsibility for the latter was transferred from the environmental to the tax authorities. The high collection rates of the excise taxes can be attributed to its simpler administration.

The share of environmentally related taxes in total tax revenues amounts to around 7% in EU member states and to 6% in OECD countries (EEA, 2000 and OECD, 2001). A further subdivision of environmentally related taxes reveals that energy products are the main tax base in the EU accounting for around 5.2% of total tax revenues (about 75% of the environmental tax revenues), followed by transport related taxes of around 1.3% and taxes on pollution and natural resources with 0.3% (EC, 2003). In Russia, natural resource taxes and pollution charges account for around 2.2% of the total tax revenues, with natural resource taxes providing 2% and pollution charges 0.2% (OECD, 2003b).

However, the share of excise taxes levied on gas and oil is much lower in Russia than in OECD countries. In 2000, the petrol consumption in Russia amounted to 23.7 million tonnes and the diesel consumption to 10 million tonnes (OECD, 2003d), generating around 37.5 bill RUR (1.3 billion USD) in excise taxes[27]. The share of these taxes in the total tax revenues is around 1.1%, low in an international comparison. Therefore, the conclusion is that the Russian tax system does not make use of the full revenue raising (and environmental protection) potential of excise taxes on petrol and diesel[28].

27 It is assumed that there are no tax exemption or reduction, i.e. reduced tax rates do not apply for different users categories, such as public transport, military, agriculture, etc.

28 A recent report published by GTZ comes to the same conclusion: GTZ, 2001, p. 70.

In order to illustrate the revenue-raising potential of the proposed motor fuel tax that would be an add-on to the excise tax, Table 4.2 shows that a rather modest increase in the excise taxes of 200 RUR per tonne could generate around 6.7 billion RUR (around 220 million USD) assuming that all consumers of petrol and diesel are facing higher motor fuel pump prices. Since diesel is considered a more environmentally harmful fuel than petrol, it is worth considering having a higher environmental tax on diesel than on petrol. However, even with an equal motor fuel tax rate for petrol and diesel, the impact on the diesel price would be higher, thereby sending a positive signal to consumers.

Table 4.2 Results of an Increase in Excise Taxes for Petrol and Diesel of 200 RUR per tonne

Fuel Type	Petrol (below 80 octane)	Diesel
Excise tax rate 2003, RUR per tonne	2,190	890
Proposed Increase, RUR per tonne	200	200
Proposed Increase, in %	9.2	22.4
Consumption, million tonnes	23.7	10.0
Revenue, million RUR	4,740	2,000
Increase in excise tax, RUR per litre	0.14	0.16
Pump price in 2003, RUR per litre	11	9
Increase in excise tax in % of pump price	1.4	1.8

Notes: Consumption figures for petrol and diesel are for 2000. No distinction between differences in octane is made in the example. Pump prices are describing situation in Moscow in the summer of 2003. 1 USD = 30 RUR.

A comparison of the additional revenues generated with the pollution charge revenues generated in 2001 reveals the real dimension of the revenue-raising potential of a motor fuel tax in Russia. The total revenues of pollution charges amounted to 7.6 billion RUR (252 million USD) in 2001 compared to the result in this example of 6.7 billion RUR (220 million USD). This shows that an introduction of even a small motor fuel tax (less than 2% of the fuel price) would generate revenues comparable to the current total revenue from pollution charges[29].

The introduction of a motor fuel tax in Russia is likely to face a number of obstacles. There is a perception that Russia's current fuel prices are already too high for the average consumer and should not be raised any further. It is generally assumed that economic instruments of environmental policy are regressive, i.e., that poorer households are affected more than high income earners. However, Table 4.2 shows that the consumer impact of the proposed motor fuel tax would be rather low, and the resulting price increase would have a negligible impact on overall inflation in Russia. Furthermore, the analysis in Denmark shows that motor fuel taxes are "more or less neutral" in terms of income distribution[30]. In Russia, this impact is likely to be progressive (i.e., be felt more by higher income groups), since the poorer households are much less likely to own a car.

A public awareness campaign would have to be launched to explain that a motor fuel tax is one of the most socially equitable means to finance public environmental programmes. In addition, a government regulation should be put in place to distribute the motor fuel tax revenue between the federal, regional, and local administrative levels and guarantee that these revenues are used exclusively for environmentally-related expenditures (even though there is likely to be opposition to this idea from the Ministry of Finance).

[29] This example does not discuss the effects of an increase of excise taxes on other taxes, such as VAT. Furthermore, it is assumed that the consumption is not affected with the end-user price increase.

[30] DEPA, 1999, p.7.

4.3 Conclusions

It follows from the analysis of the recent conceptual documents and draft Laws intended to reauthorize Russia’s pollution charge system that the changes envisioned to-date would not affect the system’s incentive impact (i.e., its environmental effectiveness), while revenues will continue to be raised in an economically and administratively inefficient way.

Taking into account the slow pace of the legislative preparation of the new law on pollution charges (it is unlikely to be adopted in 2004), the election of a new State Duma in December 2003, and the appointment of a new federal Government in March 2004, it is still possible that some of the deficiencies highlighted in this report will be eliminated and several pertinent recommendations incorporated in the final version of the Law “On Payments for Negative Impact on the Environment.” Notwithstanding the outcome of this revision of its pollution charge system, Russia is likely to continue to improve it in conjunction with other environmental regulatory reforms. For example, a reduction of the number of regulated pollutants could be part of the reform of environmental standards and lead to a reconsideration of the coverage of pollution charges. A permitting system reform would likely eliminate temporary ELVs and contribute to the streamlining of the pollution charge scheme.

In the short term, it is necessary to start a stakeholder dialogue between the key government ministries (Ministry of Natural Resources, Ministry of Economic Development and Trade, Ministry of Finance, as well as sectoral ministries), industry associations, academic experts, and NGOs on the objectives of the pollution charge system (revenue-raising and incentive-creating) and the instruments best suited to meet those objectives. The current revenue flow can initially be maintained by simultaneously reducing the charge base and increasing the charge rates. At the same time, the Russian government should consider using more effective revenue-raising mechanisms such as the motor fuel tax to fund public environmental programmes.

ANNEX A. CASE STUDY ON THE POTENTIAL DESIGN OF AN SO_2 EMISSION CHARGE IN THE RUSSIAN FEDERATION

Summary

The objective of the case study is to demonstrate a methodology for redesigning the Russian pollution charge system to increase its environmental effectiveness. It focuses on the design of a potential SO_2 charge in Russia as an example of a targeted charge for a priority pollutant that would have a strong incentive impact.

The metallurgical industry in Russia is responsible for more than 50% of the total annual SO_2 emissions from stationary sources, while the power sector accounts for almost 30%. The case study sample of SO_2 emission sources covers most significant sources in the power sector, non-ferrous and ferrous metallurgy, responsible for about two-thirds of the total stationary source emissions. Over 50% of the total SO_2 emissions included in the sample originate from five large sources in the metallurgical industry: nickel smelters in northern Siberia and the Kola Peninsula. The emissions of SO_2 from stationary sources in Russia declined from about 12 million tonnes in 1981 to 5.3 million tonnes in 2001 due to the economic decline in the 1990s as well as the switch to using natural gas instead of coal and oil for heating and power production.

The MOSES model has been used to analyse the impact of the charge on the behaviour of polluters. The model allows simulation of emission reduction, its costs to the polluters, and revenues from the charge based on the charge rate and marginal abatement cost data. Information on more than 100 large Russian industrial stationary sources of SO_2 emissions has been gathered and processed by the model.

The marginal cost curve for SO_2 abatement technologies in Russia shows that further considerable emission reductions can be achieved at a relatively low cost. The current rates vary between 0.04 RUR/kg and 1 RUR/kg of SO_2 and do not have any incentive impact. The incentive to reduce emissions can be generated at charge rates above 3 RUR/kg of SO_2, as it becomes cheaper for (large) polluters to reduce emissions than to pay the charge. If all pollution control technologies with a maximum cost of 4 RUR/kg of SO_2 reduced were implemented, almost 50% of the total emissions (in the sample) would be abated. However, an additional 25% emission reduction would already require much higher marginal costs (up to 35 RUR/kg).

The case study concludes that a charge rate of 4 RUR/kg would have two desirable effects: the emissions would be reduced by almost 50%, while the revenues from the SO_2 charge would be substantial at about RUR 7.5 billion per year (compared to the 2001 revenue of RUR 7.6 billion from charges on hundreds of pollutants). The case study also shows that even a modest SO_2 charge will impose significant costs on the polluting industries. A charge of 4 RUR/kg would lead to abatement costs of about RUR 5 billion/yr in addition to the charge payments. These conclusions make a strong case for at least partial recycling of the charge revenue to industry in order to avoid negative effects on the industry's economic performance.

A.1. Introduction

Pollution charges are the primary economic instrument for environmental protection currently used in Russia. They are levied on up to 214 air pollutants and 197 water pollutants, as well as on storage and disposal of industrial solid waste. Although their declared purpose is to provide an incentive for pollution abatement, in practice the charges are used to raise revenues for environment-related expenditures. The current levels of pollution charges in Russia are not high enough to have an incentive impact and only generate relatively small revenues, as shown in Section 2.2 of the main report.

The objective of the case study is to demonstrate a methodology for redesigning the Russian pollution charge system to increase its environmental effectiveness by targeting only selected pollutants and significantly increasing the charge rates for them. The case study applies a modelling approach to derive a flat rate of a pollution charge necessary to reduce the emissions of sulphur dioxide (SO_2). The current rates ranging from 0.04 RUR/kg to 1 RUR/kg (for exceeding temporary emission limit values) are much lower than the marginal cost of the cheapest SO_2 abatement technology available in Russia.

The study is based on the available data on existing levels of SO_2 emissions, emission sources, as well as costs (marginal cost functions) of relevant abatement technologies. The case study simulates the emissions, revenues, and total abatement costs at different SO_2 emission charge levels. Although the modelling methodology is applied to one pollutant for the purposes of the case study, it could be used for other pollutants for which needed data are available.

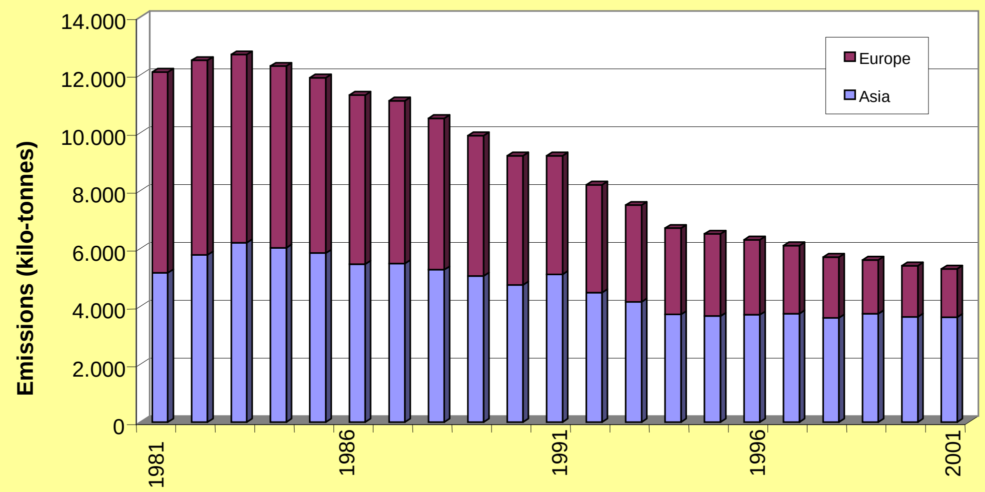
Section A.2 defines the sample of SO_2 sources examined for the purposes of the charge vis-à-vis the total SO_2 emissions in Russia. Section A.3 describes the methodology and the model used in the case study. Section A.4 presents the marginal cost function of SO_2 abatement in Russia. Section A.5 discusses the increasing rate of the SO_2 emission charge and its impact on emission reduction, revenues, and industry competitiveness. Finally, Section A.6 evaluates the economic efficiency of the simulated SO_2 charge.

A.2. Russia's SO_2 Emissions and the Case Study Sample

Figure A-1 shows the trend in total SO_2 emissions in the Russian Federation over the last 20 years, with a distinction between the emissions of SO_2 in the Asian part and the European part of Russia. Since 1980, SO_2 emissions have decreased by more than 50% (from 12,000 kilo-tonnes in 1981 to 5,300 kilo-tonnes in 2001). This decrease is due to several reasons: the economic decline, a fuel shift in power plants and industry from coal to natural gas (primarily driven by a price differential between them), especially in the European part of Russia, as well as pollution control, mainly in the metallurgical industries. While the SO_2 emissions in the Asian part of Russia have decreased by 28%, the reduction of SO_2 emissions in the European part has been more than three-fold. Since 1997, Russia has been in compliance with the 1994 Oslo Protocol on Sulphur Emissions to the 1979 Geneva Convention on Long-Range Transboundary Air Pollution that established a 40% reduction target (compared to the 1980 level) for Russia's European SO_2 emissions for 2005 and 2010.

However, the SO_2 emission decline in Russia is likely to be reversed in the near future, unless targeted policy measures are taken. The domestic prices for natural gas (so far heavily subsidised by the government) are expected to triple within the next 5 years, making coal economically attractive again and possibly leading to a sharp increase in SO_2 emissions from the power sector[31].

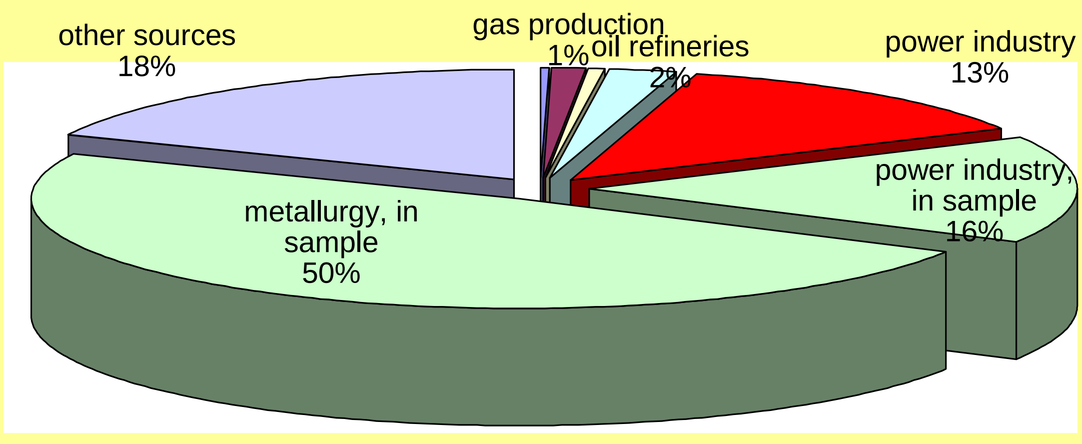
Figure A-1. SO2 Emissions in the Russian Federation, 1981-2001



Source: Ministry of Natural Resources, 2001

The sample in the case study covers about 67% of the SO_2 emissions of stationary sources in Russia, as shown in Figure A-2. The case study covers most emissions from the power sector and the ferrous (iron and steel) and non-ferrous (mainly nickel and copper) metallurgical industry.

Figure A-2. SO2 Emission Sources in Russia (total = 5.3 million tonnes/yr)

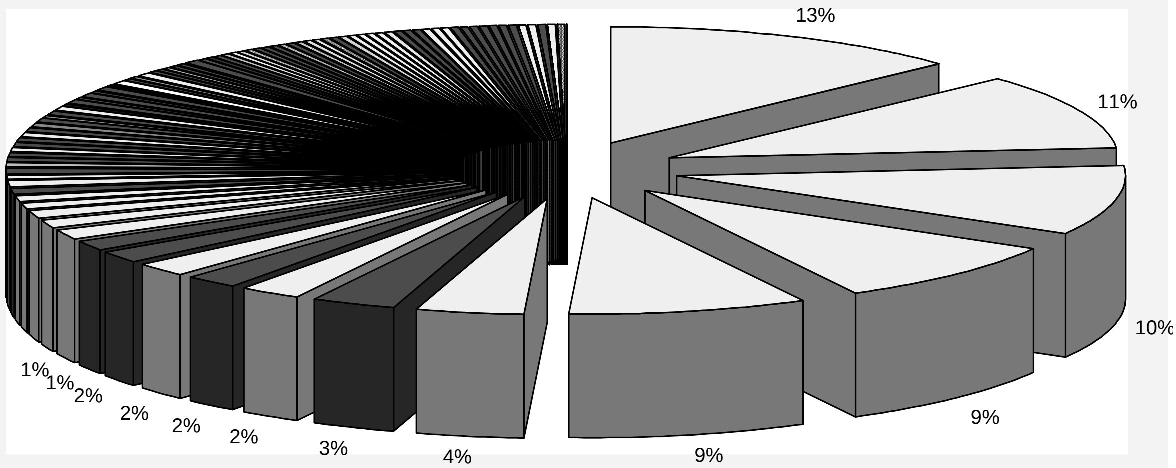


Source: IEA. 2002.

[31] Ministry of Energy, 2001.

To enable modelling of the sources of SO_2 in Russia, data have been collected for 80 individual sources in the power sector and 30 individual sources in the metallurgical sector. Figure A-3 illustrates the distribution of SO_2 emissions within the sample.

Figure A-3. Distribution of Case Study SO2 Emissions by Source (total = 3.6 million tonnes/yr)



Sources: RAO UES, 1999; Ministry of Natural Resources, 2001; Norilsk Nickel, 2003

Figure A-3 clearly shows that more than 50% of the total emissions in the sample comes from the five largest sources in the metallurgical industry. The largest source of SO_2 emissions in Russia is the Norilsk Nickel company in the city of Norilsk in Northern Siberia. This huge industrial complex comprising many aging installations produces large amounts of nickel and copper, as well as precious metals like gold, platinum and palladium. SO_2 emissions from the plant's four large sources (stacks) and about 1000 small sources are about 2 million tonnes per year (roughly 35% of Russia's total SO_2 emissions). Metallurgical industries in other locations (especially in Murmansk) have a similar composition of sources: a few large and many smaller ones. The 30 metallurgical industry sources covered in the case study have annual SO_2 emissions of between 2,000 kilo-tonnes (Norilsk) and 20 kilo-tonnes. About 80 power sector sources covered in the study have annual SO_2 emissions ranging from less than 1 kilo-tonne to 120 kilo-tonnes (on average, 11.5 kilo-tonnes).

The selection of SO_2 sources for the sample in this case study is related to the larger issue of setting a threshold for the inclusion of stationary sources into the emission charge base. Two major factors should be considered in this decision:

- Will the charge be effective in reducing pollution from the sources it would be imposed on?
- Are the costs of administering the charge (that are a function of the number of sources included in the charge base) low enough for the charge to be efficient?

Experience with costs of abatement technologies for SO_2 shows that in general, small sources would only respond to relatively high charge rates, whereas larger sources, which can reduce emissions more efficiently, would, in principle, respond to lower SO_2 charges by undertaking abatement measures.

The information available on sources of SO_2 emissions in Russia is insufficient to give a definitive recommendation on the level of the charge base threshold that would be most appropriate in the Russian context. However, it can be concluded that the sources included in this case study would all satisfy the first criterion defined above. That would imply an SO_2 emission threshold of about 1000 tonnes per year. For those sources (whose number would be limited to a few hundred in Russia), relatively inexpensive measures to reduce SO_2 emissions are generally available, thus ensuring an incentive impact of the charge.

A.3. Methodology: the MOSES Model

The MOSES model ("Model On Sustainable Environmental Scenarios")[32] was used in the case study to simulate the design of an SO_2 charge and its incentive and revenue-raising impacts in Russia. Figure A-4 outlines the model's structure.

[32] MOSES was developed in 1992 by TME, Institute for Applied Environmental Economics, the Netherlands, and has been applied successfully in projects in many countries (e.g., the Netherlands, Poland, etc.).

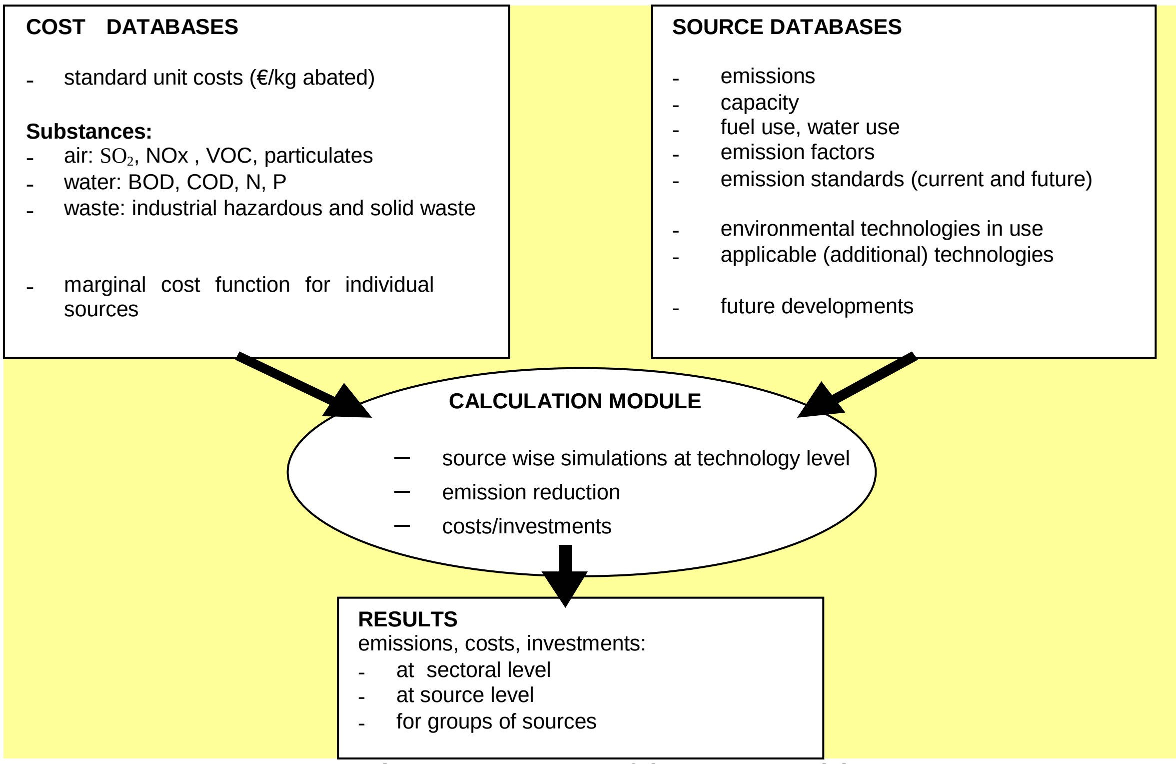


Figure A-4. Structure of the MOSES Model

The model consists of two interlinked databases:

- Source inventories describing sources of pollution (for example, large combustion plants or metallurgical industries);

- Technology databases describing (standard) technologies to reduce emissions and respective unit costs.

The basic design of MOSES is simple. The idea is that for each pollution source in the sample, a marginal abatement cost function can be created. Costs in this function are related to emission abatement and expressed in monetary terms per unit of emission reduction. By creating these marginal cost functions for each source, it is possible to rank technological options according to their cost effectiveness. In a case study, MOSES calculates for each source the costs of emission reduction in response to a tax or charge or to achieve a given reduction target.

MOSES includes standard technology databases for abatement of different substances, including SO_2.

It is also possible to add to the database more precise pollution source information or specific cost estimates. For this case study, Russian-specific information on the costs and investments for sulphuric acid plants, emission-optimised sintering and various scrubbers/strippers in the metallurgical industry has been collected and included in the database.

In the MOSES databases, costs and investments are standardised based on Western European price levels and are expressed in euros per kilogramme of emission reduction achieved by the technology. The standard cost functions are based on in-depth studies of abatement options for various branches of industry. To adapt the costs to the local circumstances, MOSES allows to use correction factors in the calculation. For this case study, the following correction factors have been applied[33]:

– 80% of the Western European price levels for equipment;
– 30% for civil construction;
– 30% for labour costs;
– 30% for energy costs;
– 60% for other (chemicals, disposal) costs.

There are several technologies to reduce SO_2 emissions from *power plants*. The technology databases of MOSES include the following technologies:

- Dry additive injection (purification efficiency of 35%, unit costs of 0.15-0.20 €/kg SO_2);

- Dry sorption process (purification efficiency of 61.5%, unit costs of 0.84-1.04 €/kg SO_2);

- Wet limestone scrubbing (purification efficiency of 80%, unit costs of 2.30-5.00 €/kg SO_2).

In *non-ferrous metallurgy* (nickel and copper production), the source of SO_2 emissions is the ore from which non-ferrous metals are extracted. As concentrations of sulphur are very high in the flue gas, it is possible to produce sulphuric acid from such flue gas. The production of 1 tonne of sulphuric acid (H_2SO_4) is equivalent to 640 kg of (avoided) SO_2. This is a common technology used in non-ferrous metallurgy in the European Union. Its purification efficiency is 90% and the unit cost is 0.1 €/kg SO_2. Other measures to reduce SO_2 emissions from metallurgical processes include wet scrubbers, injection of calcium or lye, etc.[34]

In the calculation module, the data are combined and processed to estimate emissions and emission reductions, annual costs, total investments, and tax revenues. The model can be used to assess the effects of emission charges or tradable permits, as well as the application of emission standards.

The results of calculations with MOSES have a degree of uncertainty. In reality, abatement costs for individual sources may differ significantly from the standardised unit cost used in the model. In addition, MOSES assumes economically rational behaviour: if charge payments are higher than the marginal abatement cost, emissions will be reduced. In practice, the decision to invest in emission control also depends on the availability of funds, the existence of "soft budget constraints"[35], etc.

For the case study as a whole, a 25% margin of error in calculations should be taken into account.

A.4. Marginal Cost Function of SO_2 Abatement in Russia

Based on the inventory of sample sources of SO_2 emissions in Russia and the SO_2 abatement technology database, the MOSES model was used to estimate a marginal abatement cost curve (Figure A-5), starting from the cheapest per-unit SO_2 reduction options to the more expensive ones.

---

[33] In the calculations, it has been assumed that € 1=RUR 35. The interest rate for RUR applied in the model is 16% (Economist, 2003).

[34] All the technologies considered in the MOSES model are end-of-pipe pollution abatement solutions. However, it is reasonable to expect that there are cheaper cleaner production technology options whose introduction would be stimulated by an SO_2 charge (this would characterise the charge's dynamic efficiency).

[35] Soft budget constraints mean that an enterprise is subsidised by the state and, therefore, does not have an incentive to improve its production and management methods.

Figure A-5. Marginal SO_2 Abatement Cost Curve (for case study sample)

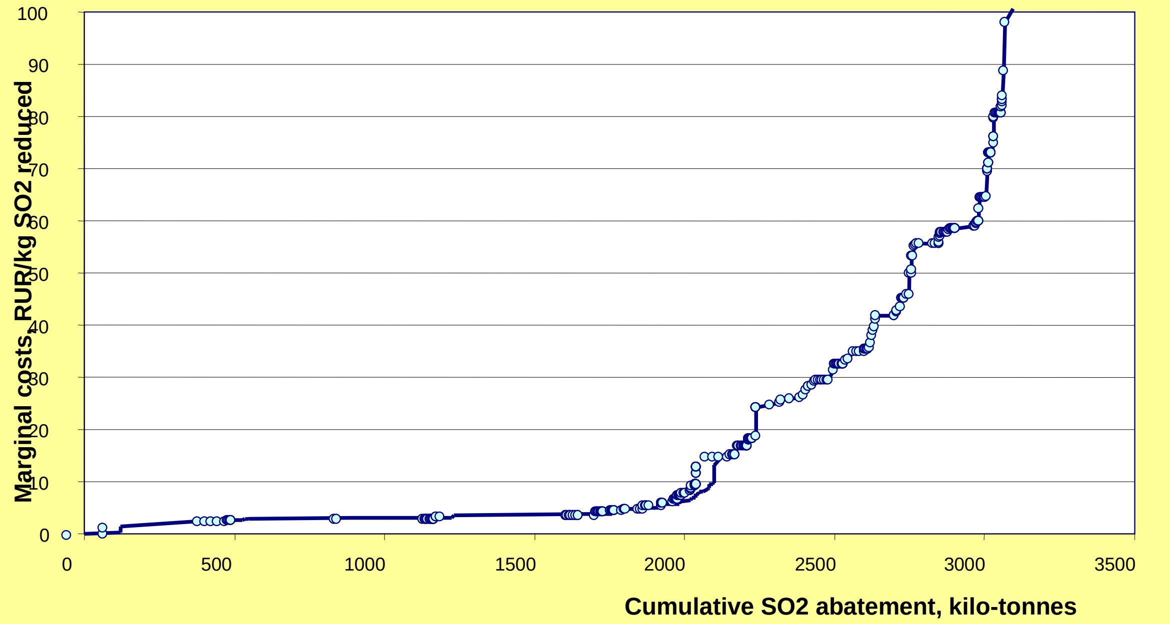


Figure A-5 shows the total potential of emission reduction technologies applicable to the sources. It can be seen that the cheapest options cost less than 10 RUR/kg and allow a reduction of over 60% of the total SO_2 emissions in Russia. The most expensive abatement options cost more than 100 RUR/kg and are probably unaffordable for most Russia's SO_2 polluters at this time. Figure A-6 magnifies the same marginal cost curve.

Figure A-6. Marginal SO_2 Abatement Cost Curve (magnified)

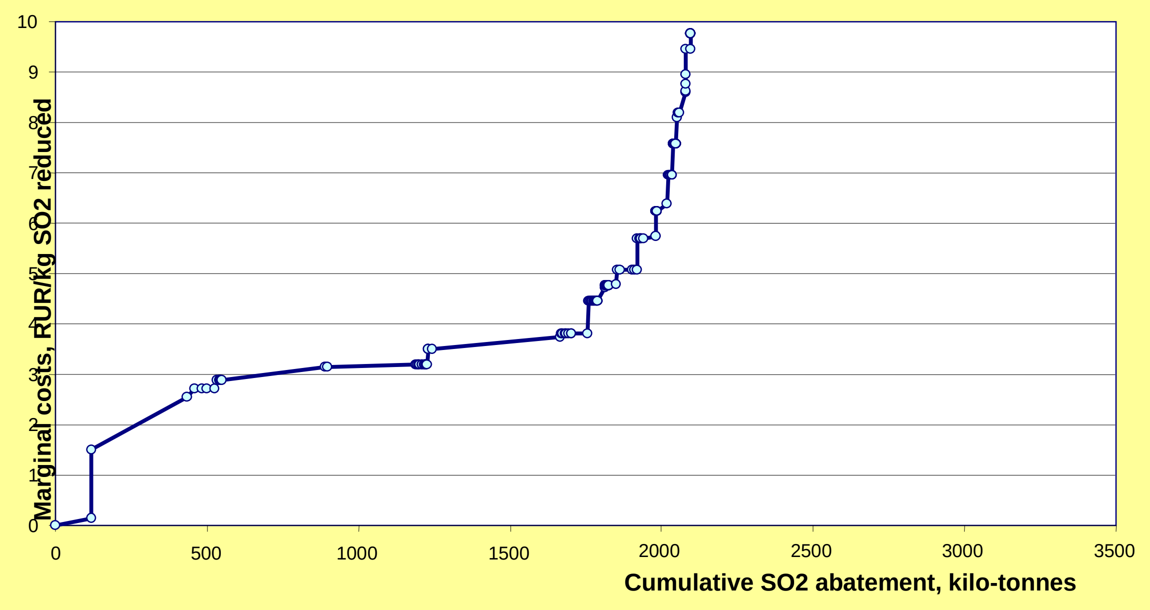


Figure A-6 shows that a reduction of 500 kilo-tonnes of SO_2 can already be achieved at less than 3 RUR/kg, while about 1,750 kilo-tonnes of SO_2 could be reduced at the maximum cost of 4 RUR/kg. Abatement technologies with a maximum cost of 10 RUR/kg would increase the abatement of SO_2 by another 300 kilo-tonnes. Therefore, relatively low levels of an SO_2 charges could stimulate considerable reductions of SO_2 emissions in the Russian Federation.

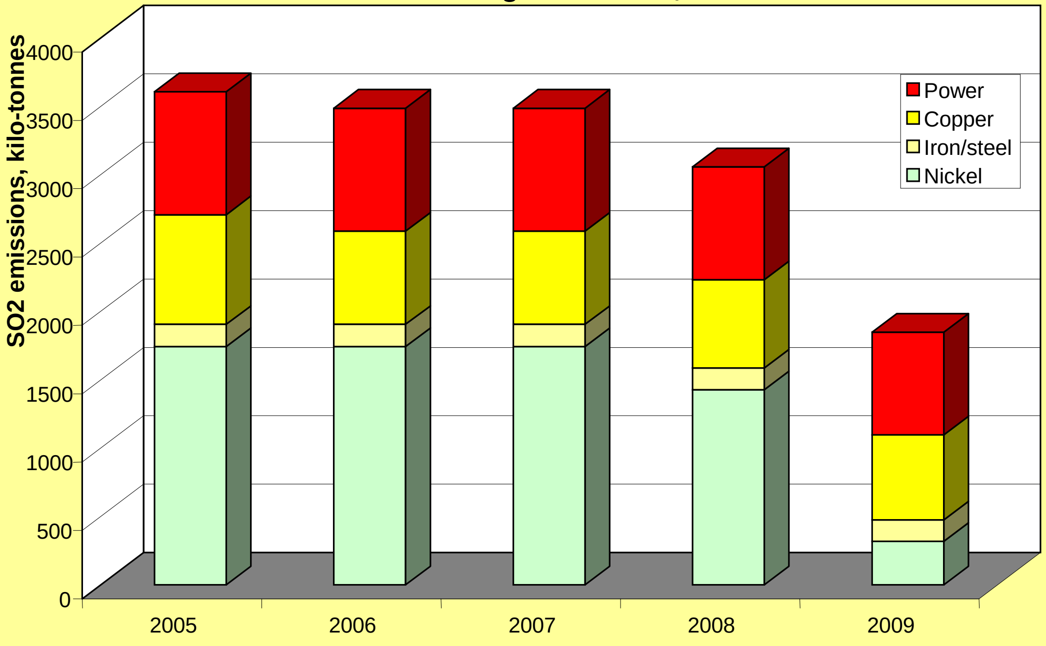
A.5. Gradual Increase of the SO_2 Charge and Its Impact

To illustrate the effect of an SO_2 emission charge in Russia, a simulation has been made of a gradual increase of the charge rate from 1 RUR/kg (29 €/tonne, or 25 times the current base rate) in 2006 to 4 RUR/kg (115 €/tonne, or 100 times the current base rate) in 2009[36] by adding 1 RUR/kg (adjusted for inflation) to the rate every year. The results of this simulation are shown in Figures A-7 and A-8.

A.5.1 Environmental Impact

Figure A-7 shows that, if industries seek to minimise the sum of their abatement costs and charge payments, the SO_2 emissions could be reduced by almost 50% by 2009 as a result of such increase. Largest reductions would take place in the non-ferrous metallurgy (nickel/copper), while smaller reductions can be expected in the other sectors.

Figure A-7. Simulated Pollution Reduction Impact of an SO_2 Emission Charge in Russia, 2005-2009



A.5.2 Revenue-raising Impact

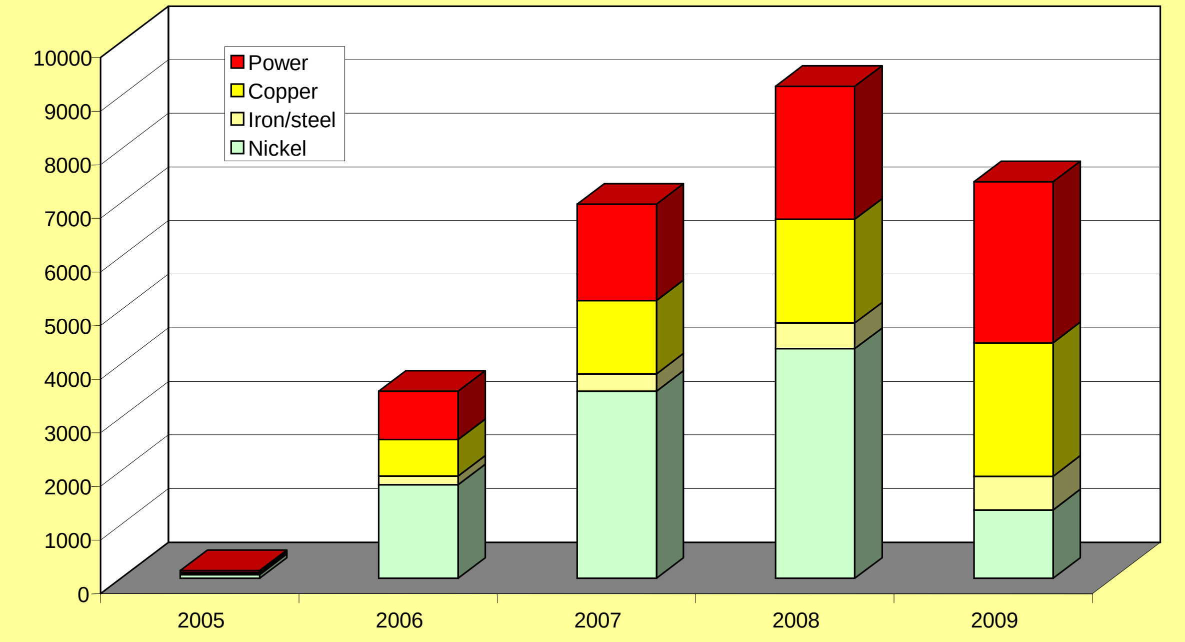
Figure A-8 shows the revenues of the SO_2 charge. In 2005, the revenues would be small (about RUR 144 million), as the current level 0.04 RUR/kg would be applied. In 2006, since the rate is still too low to

[36] It is assumed that the rate will be flat and not depend on the compliance with emission limit values.

have an incentive impact (1 RUR/kg), the total SO_2 emissions remain virtually unchanged, but the revenues increase sharply (to RUR 3.5 billion per year). Increasing the charge rate to 3 RUR/kg (by 2008) would also lead to an almost linear increase in revenues (to RUR 9 billion), while more abatement of SO_2 would be induced (up to 500 kilo-tonnes compared to 2005).

However, a further increase of the rate to 4 RUR/kg the following year would not lead to more revenues. Due to the reduction of SO_2 emissions (especially in the nickel-producing industries) by 1,200 kilo-tonnes compared to 2008, the annual revenues will stabilise at about RUR 7.5 billion.

Figure A-8. Simulated SO_2 Emission Charge Revenues, million RUR



A.5.3 Impact on Industry

Figure A-8 also demonstrates that some sectors will be affected more by the charge than others. The nickel producing industries will be able to reduce charge payments considerably due to taking relatively cheap measures. But for the other industries (the power sector and copper production in particular) the charge payments would seem to keep pace with the increased rates imposed on them, as they do not have cheap abatement options at their disposal.

The total cost (charge payment plus abatement cost) burden for the different industries (in 2009) is shown in the following table, giving an indication of the possible effects on competitiveness of these industries or of the additional costs they would have to pass on to consumers (which could be the case with power generation, as this is a “local” market without international competition).

Table A-1 Cost Burden (million RUR) for Different Industrial Sectors under an SO_2 Charge Rate of 4 RUR/kg

Sector	Nickel	Iron/steel	Copper	Power	**Total**
Charge payments	1,273	629	2,490	3,004	**7,420**
Abatement costs	4,590	15	193	464	**5,262**
Total cost burden	5,863	644	2,683	3,468	**12,682**

The table shows that in absolute terms, the burden of a moderate SO_2 charge would be considerable: almost RUR 7.5 billion. This is about the same burden as the current revenues of all environmental charges in the Russian Federation (RUR 7.6 billion in 2001). The following two examples serve to illustrate the burden of the pollution control investments and the SO_2 charge payments for individual enterprises.

The annual turnover of Norilsk Nickel, Russia's metallurgical giant, is RUR 84 billion (€ 2.4 billion), the gross profit in 2002 was RUR 40 billion (€ 1.1 billion), the net profit attributable to shareholders RUR 17.5 billion (€ 0.5 billion). The charge payments (at the rate of 4 RUR/kg SO_2) for Norilsk Nickel are estimated at RUR 2.7 billion, reducing the profit for shareholders by about 15% and the gross profits by 10%. Additionally, it is expected that this enterprise would make considerable investments to reduce SO_2 emissions, resulting in an annual cost burden of about RUR 5 billion.

In the power sector, a SO_2-charge of 4 RUR/kg would increase the production costs by about RUR 3 billion. It can be estimated that of the total power generated by thermal power stations (534 billion kWh in 2000), about 37% is produced by coal or heavy fuel oil combustion (that generates SO_2 emissions). The coal/oil combustion plants covered by the case study produce 108 billion kWh of electricity (55% of all coal/oil thermal plants). The charge would, therefore, be equal to 0.028 RUR/kWh, relatively small compared to the current consumer price for electricity (around 1 RUR/kWh).

It is clear from this first example that the introduction of a higher SO_2 emission charge would be strongly resisted by Russia's metallurgical industry because it would lose a significant share of its net profits. *Therefore, a revenue recycling mechanism should be designed to compensate the potential loss of competitiveness by either subsidising investments in pollution control or providing industry with other forms of tax rebate.* Although the impact on the power sector is likely to be much more limited, a revenue recycling mechanism could be introduced there as well, out of equity considerations.

A.6. Economic Efficiency of the Simulated SO_2 Emission Charge

Figure A-9 demonstrates the environmental, cost, and revenue impacts of the an SO_2 emission charge of up to 10 RUR/kg SO_2 (286 €/tonne). It shows that the cost efficiency of the charge (the ratio between the total burden on industry and the environmental effect) is decreasing sharply at the charge rates higher than 4 RUR/kg. While the 4 RUR/kg rate would generate an emission reduction of almost 50% compared to the present level, a further rate increase to 10 RUR/kg would not result in much more emission reduction but would impose both higher charge payments and abatement costs on industry. *Therefore, the 4 RUR/kg SO_2 emission charge rate can be considered close to optimal in the short to medium term.*

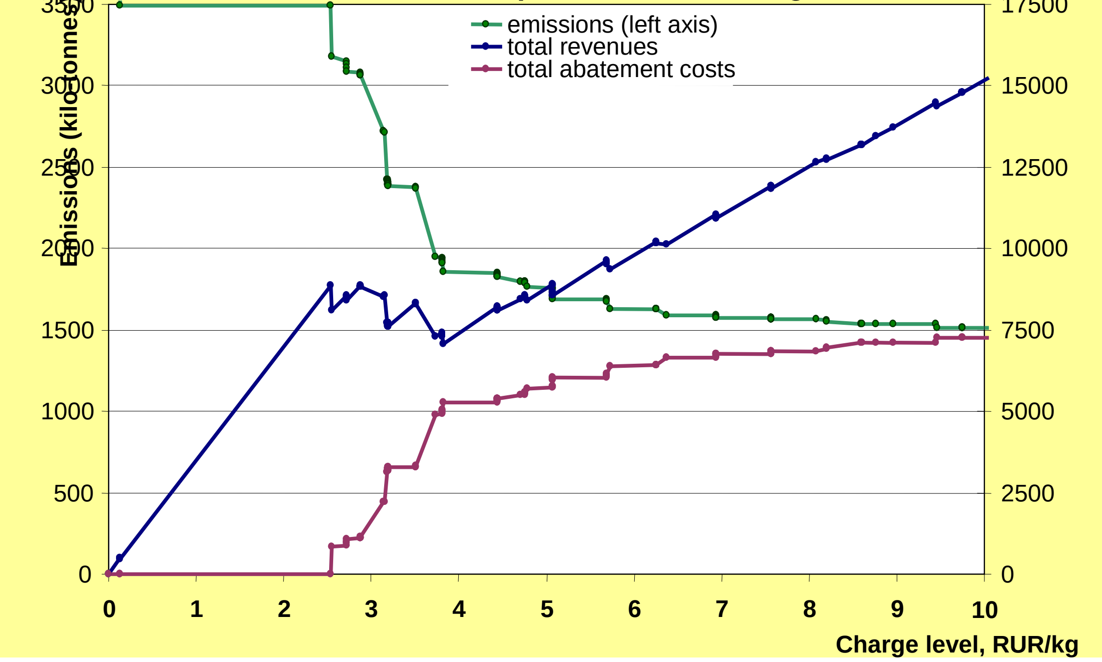


Figure A-9. Emission Reduction, Abatement Cost and Revenue Impact of an SO_2 Charge

According to the environmental economics theory, pollution abatement can be achieved at lower costs by applying market-based instruments (in this case, a SO_2 emission charge) than by applying regulatory instruments (emission limit values, ELVs). One of the main theoretical advantages of pollution charges is that pollution abatement can be achieved in the most cost-effective way, as polluters can make their own economically driven judgement on whether or not to reduce emissions.

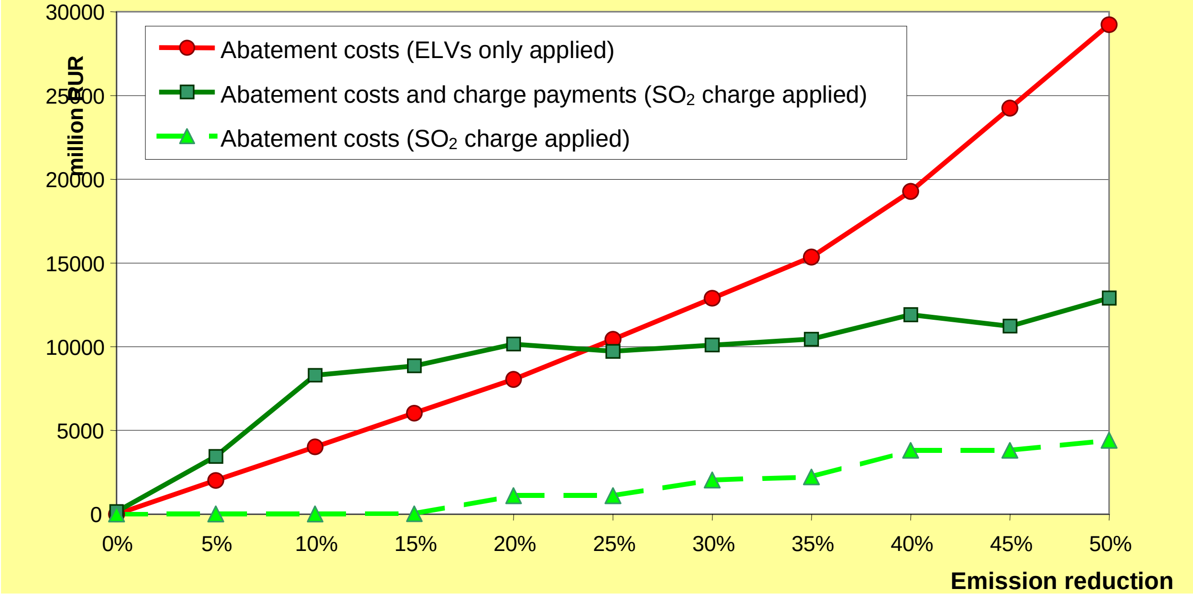


Figure A-10. Total Costs of Reduction of the SO_2 Emissions of up to 50% by Applying an SO_2 Charge vs. ELVs

Figure A-10 compares the total annual abatement cost for the Russian industry (limited to the case study sample) to achieve an SO_2 emission reduction of between 5% and 50%. It shows that the total abatement costs (excluding the charge payments) for the industries to reduce their SO_2 emissions by up to 50% would be by far the lowest with the application of an SO_2 charge[37]. The figure also shows that the addition of the charge payments changes the picture: for up to an about 25% emission reduction, the total cost burden (charge payments plus internal abatement costs) would be heavier for industry than with a straightforward application of ELVs. This cost differential could be offset by recycling part of the charge revenues to subsidise environmental investments in industry.

[37] The theory's assumption is that the regulator sets the same, across-the-board reduction target for every emission source. This almost never happens in practice: ELVs are usually set on the basis of environmental quality standards and/or technical considerations (such as the Best Available Techniques, BAT). While the theory's principal conclusion about the effectiveness of economic instruments is valid, the estimates of costs of the application of regulatory instruments should be regarded with some scepticism.

ANNEX B. LIST OF PARTICIPANTS OF THE EXPERT WORKSHOP

11 March 2004, Moscow, Higher School of Economics

Name	Organisation
DAIMAN Sergei	Ecoline (NGO), Project Manager
DUNAYEVSKY Leonid	Centre for Electromagnetic Safety, Head of Division
GAVRILOV Vsevolod	Ministry of Economic Development and Trade, Head of Department
GOLUBEVA Svetlana	ICF/EKO Environmental consulting firm, Business Development Manager
FEDOROV Andrei	Ministry of Taxation, Head of Department of Resource Payments
FOMENKO Georgy	NGO «Cadastre», Yaroslavl, Director
JANTZEN Jochem	Institute for Applied Environmental Economics (TME), the Netherlands, Director
KLIMANOV Sergei	Centre for Environmental and Economic Research and Information, Deputy Director
KLUSHINA Elena	Moscow City Department of Nature Use and Environmental Protection, Advisor, Economics and Finance Division
KOROBOVA Nina	Danish Environment Protection Agency (DEPA), Project Coordinator for Russia
KOZELTSEV Mikhail	Russian Regional Environmental Centre, Executive Director
KRIVOV Ravil	Ministry of Natural Resources
KUZNETSOV Alexander	Neusiedler Company, Syktyvkar, Deputy Director
LIMONOVA Irina	Ministry of Economic Development and Trade, Head of Division
LOBANOVA Elena	Centre for Environmental and Economic Research and Information, Director
MARTOUSSEVITCH Alexander	OECD, Environment Directorate, Consultant
MAZUR Eugene	OECD, Environment Directorate, Project Manager
PETROVA Tatiana	State University of Moscow, Faculty of Law,

Name	Organisation
	Land Law Department, Professor
RAZBASH Olga	Russian Regional Environmental Centre, Administrator
SHEVCHUK Anatoly	Ministry of Nature Resources, Head of Department
SHESTERIUK Anatoly	Moscow City Department of Nature Use and Environmental Protection, Head of Department of State Environmental Control
SHILKINA Olga	Ministry of Economic Development and Trade, Deputy Director, Department for Sustainable Development
TERENTIEV Andrei	Russian Regional Environmental Centre, Administrator
YAROSHEVSKY David	Institute of Water Problems of the Russian Academy of Sciences, Senior Researcher
YUDINA Natalia	Moscow Department of Nature Use and Environmental Protection, Leading Specialist, Economics and Finance Division
ZWEERING Albert	Consultant

REFERENCES

Danish Environmental Protection Agency (DEPA), 1999, *Economic Instruments in Environmental Protection in Denmark*, Copenhagen.

Economist, 2003, "Emerging market indicators", November 29 – December 5, p. 108, London.

ECOTEC, 2001, *Study on the Economic and Environmental Implications of the Use of Environmental Taxes and Charges in the European Union and Member States*. Report for the European Union http://europa.eu.int/comm/environment/enveco/taxation/environmental_taxes.htm.

Ernst & Young, 2002, *Russian Tax Brief: August 2002*, Moscow, www.ey.com/russia

Ernst & Young, 2003, *Oil and Gas Tax Guide to Russia*, Moscow.

European Commission (EC), 1995, *Waste-Water Charge Schemes in the European Union,* Office for Official Publications of the European Communities, Luxembourg.

European Commission (EC), 2003, *Excise Duty Tables April 2003,* DG Taxation and Customs Union, Brussels.

European Environment Agency (EEA), 2000, *Environmental Taxes: Recent Developments in Tools for Integration*, Copenhagen.

Frøyen O. 1997, Policy Instruments to Achieve SO_2 Goals in the Nordic Countries, With a Focus in the SO_2 Tax System, in: Organisation for Economic Co-operation and Development (OECD), 1997, *Applying Market-Based Instruments to Environmental Policies in China and OECD Countries*, Paris.

Goskomstat, 2002, *Report on Status of Environment in Russia in 2001*, in Statistical Bulletin No. 5, Moscow.

Goskomstat, 2003, *Statistical Yearbook 2002,* Moscow.

GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit), 2001, *Fuel Prices and Vehicle Taxation,* Eschborn, Germany.

International Monetary Fund (IMF), 2002, *Russian Federation: Selected Issues and Statistical Appendix*, IMF Country Report No 02/75, Washington.

International Energy Agency (IEA), 2002, *Russia Energy Survey 2002*, Paris.

International Tax & Investment Center (IT&IC), 2002, *Special Report – The Taxation System and Economic Development in Select Countries of Eurasia,* Washington, www.iticnet.org

IPTS, 2001, "Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques in the Non Ferrous Metals Industries", Institute for Prospective Technological Studies

Seville, one of the seven scientific institutes making up the Joint Research Centre (JRC) of the European Commission, Spain.

Kozeltsev M. and A. Markandya, 1997, Pollution Charges in Russia: The Experience of 1990-1995, in: Bluffstone R. and B. Larson (eds.) *Controlling Pollution in Transition Economies*, Edward Elgar, Cheltenham, UK.

Kraemer R. A., 1995, *The Effectiveness and Efficiency of Water Effluent Charge Systems: Case Study on Germany*, OECD Environment Directorate ENV/EPOC/GEEI(95)12, Paris.

Larson B. and Kozeltsev M., 1998, Implementation of ambient air quality protection measures: case of Tula Oblast, *Eco-funds strengthening and environmental management, part 1*, Higher School of Economics, Moscow, 1998.

Ministry of Energy of the Russian Federation, 2001, "The Main Issues of Russia's Energy Strategy until 2020", Moscow.

Ministry of Natural Resources of the Russian Federation, 2001, "Yearbook on Pollutant Emissions to the Atmosphere of Cities and Regions of the Russian Federation in 2000", Research Institute for Air Protection, St. Petersburg.

Ministry of Natural Resources of the Russian Federation, 2002, "Yearbook on Pollutant Emissions to the Atmosphere of Cities and Regions of the Russian Federation in 2001", Research Institute for Air Protection, St. Petersburg.

Ministry of Natural Resources of the Russian Federation, 2002, "State of Fulfilment of Obligations of the Russian Federation under the 1979 Convention on Long-Range Transboundary Air Pollution", Moscow.

Norilsk Nickel, 2003, Annual Report 2002, www.nornik.ru

Nyström S. and A. Berqvist, 1997, Fiscal Reform and Environmentally Related Taxes: Policy Formulation and Experience in Sweden, in: Organisation for Economic Co-operation and Development (OECD), 1997, *Applying Market-Based Instruments to Environmental Policies in China and OECD Countries*, Paris.

Organisation for Economic Co-operation and Development (OECD), 1997, *Environmental Taxes and Green Tax Reform*, Paris.

Organisation for Economic Co-operation and Development (OECD), 1999a, *Environment in the Transition to a Market Economy Progress in Central and Eastern Europe and the New Independent States*, Paris.

Organisation for Economic Co-operation and Development (OECD), 1999b, *Economic Instruments for Pollution Control and Natural Resource Management in OECD Countries: A Survey*. Revised Working Paper, March 1999, Paris.

Organisation for Economic Co-operation and Development (OECD), 1999c, *OECD Environmental Performance Reviews Russian Federation*, Paris.

Organisation for Economic Co-operation and Development (OECD), 2000, *Economic Instruments for Pollution Control and Natural Resource Management: The Russian Federation – draft country chapter*, Paris.

Organisation for Economic Co-operation and Development (OECD), 2001, *Environmentally Related Taxes in OECD Countries: Issues and Strategies,* Paris.

Organisation for Economic Co-operation and Development (OECD), 2002a, *OECD Economic Surveys Russian Federation*, Volume 2002/5, Paris.

Organisation for Economic Co-operation and Development (OECD), 2002b, EAP Task Force, *Streamlining the Use of Economic Instruments of Environmental Policy in the Rostov Oblast, Russia,* Final Project Report, Paris, CCNM/ENV/EAP(2002)1.

Organisation for Economic Co-operation and Development (OECD), 2003a, EAP Task Force, *Developing Effective Packages of Environmental Policy Instruments in Eastern Europe, Caucasus and Central Asia (EECCA): Experience and Directions for Reform*, Fourteenth EAP of the Task Force Meeting, 10-11 February 2003, Tbilisi, Georgia, CCNM/ENV/EAP(2003)4.

Organisation for Economic Co-operation and Development (OECD), 2003b, EAP Task Force, *The Use of Economic Instruments for Pollution Control and Natural Resource Management in EECCA*, Fourteenth EAP of the Task Force Meeting, 10-11 February 2003, Tbilisi, Georgia, CCNM/ENV/EAP(2003)5.

Organisation for Economic Co-operation and Development (OECD), 2003c, *Environmental Taxes and Competitiveness: An Overview of Issues, Policy Options, and Research Needs,* COM/ENV/EPOC/DAFFE/CFA(2001)90/FINAL.

Organisation for Economic Co-operation and Development (OECD), 2003d, *OECD Environmental Data Compendium 2002*, Paris.

RAO-UES, 1999, “Emission Data for large Power Plants”, United Energy Systems of Russia, Moscow.

Regional Environmental Center for Central and Eastern Europe (REC), 2001, *Environmental Taxes in an Enlarged Europe: An Analysis and Database of Environmental Taxes and Charges in Central and Eastern Europe,* Szentendre, Hungary.

RECEP, 2002, Russian Economic Trends Monthly, 14 October 2002, www.recep.org.

Söderholm P., 1999, Environmentally Policy in Transition Economies: The Effectiveness of Pollution Charges, Lulea University of Technology, Lulea, Sweden.

Symons E.J., S. Speck and J.L.R. Proops, 2002, The Distributional Effects on Carbon and Energy Taxes: The Cases of France, Spain, Italy, Germany and the UK, *European Environment* Vol. 12, pp. 203-212.

Tacis, 2003, *Support to the Implementation of Environmental Policies and NEAPs in the NIS – Sub-Project Georgia: Increasing the Effectiveness of Economic Instruments,* European Commission, Brussels.

TME, 1999, “Using MOSES for Assessment of Costs and Cost Effectiveness of Environmental Policy: Some Applications”, paper prepared for the workshop on “Technical-economic Databases on Production Processes and Related Emission Abatement Options”, Angers (France), 28-29 October 1999 (www.tme.nu).

UNECE, 2003, *Environmental Partnerships in the UNECE Region: Environment Strategy for Countries of Eastern Europe, Caucasus and Central Asia,* Strategic Framework, Geneva.

World Bank, 1998, *Pollution Prevention and Abatement Handbook*, Washington DC.

World Bank, 2002, *Generating Public Sector Resources to Finance Sustainable Development*, Final Draft 10. October 2002, Washington DC.

Zhnovosky G.M., 2002, "Technical data power plants in the Russian Federation", Power Engineering Institute, Moscow.

Zinnes C., C. Tarhoaca and M. Popovici, 1998, *The Role of Enforcement and Economic Instruments in Inducing Environmental Investment in a Transition Economy: The Water Sector in Romania*, Harvard Institute for International Development (HIID), Environment Discussion Paper No. 42.