

ENVIRONMENT FOR EUROPE
UN ENVIRONNEMENT POUR L'EUROPE
ОКРУЖАЮЩАЯ СРЕДА ДЛЯ ЕВРОПЫ
AARHUS, 23-25 JUNE 1998



FOURTH MINISTERIAL CONFERENCE
ENVIRONMENT FOR EUROPE

Århus, Denmark
23 - 25 June 1998

SOFIA INITIATIVE: ECONOMIC INSTRUMENTS
REPORT ON THE USE OF ECONOMIC INSTRUMENTS FOR
ENVIRONMENTAL POLICY IN CENTRAL AND EASTERN EUROPE

prepared by

The Czech Republic and Regional Environmental Center for Central and
Eastern Europe

BACKGROUND DOCUMENT



UNITED NATIONS
ECONOMIC COMMISSION FOR EUROPE

Sofia Initiative

Economic Instruments

Report on the Use of Economic Instruments for Environmental Policy in Central and Eastern Europe

Environment for Europe
Fourth Ministerial Conference

Arhus, Denmark
23-25 June, 1998



Chair:
Deputy Minister Erik Geuss
Ministry of Environment, Czech Republic



Secretariat:
Regional Environmental Center
for Central and Eastern Europe

Acknowledgements

This report is based on the work performed under the Sofia Initiative on Economic Instruments. In particular, the report draws upon comprehensive data and analysis by local experts on the use of economic instruments in 14 CEE countries compiled in the Sourcebook on Economic Instruments (publication forthcoming). The following experts have contributed with detailed country surveys:

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The report includes also the conclusions from the discussions held at the occasion of the SIEI Expert Meeting held on April 16-7, 1998 at the REC in Szentendre which was attended by most of the experts mentioned above as well as Hans Bergman of the European Commission, Patrick Francis, EAP Task Force, OECD, Ulrik Dan Weuder from the Danish EPA, Michael Betts, Integrated Skills Ltd., Miroslav Hajek, Czech Ministry of Environment, Sona Zahoranova, Ministry of Environment of Slovakia, Tatiana Kluvankova, Prognostic Institute, Slovak Academy of Science of Slovakia, Bojan Radej, Institute of Macroeconomic Analysis and Development, Slovenia. Special thanks goes to Jim McNicholas for proofreading the report.

This report has been prepared by Jürg Klarer, REC, SIEI Secretariat and Zsuzsa Lehoczki, Budapest University of Economic Sciences / COWI.

Finally, the generous support from the Danish Environmental Protection Agency, the Swiss Federal Office of Environment, Forests and Landscape, the French Ministry of Environment and the Czech Ministry of Environment is gratefully acknowledged.

The Sofia Initiative on Economic Instruments

The 1995 Environment for Europe Ministerial Conference in Sofia, Bulgaria, approved the Sofia Initiatives which were set up by high level officials from Central and Eastern Europe. By intensifying the sharing of positive experiences, the Sofia Initiatives are intended to broaden and deepen successful initiatives in the region. One of the four Initiatives is on Economic Instruments: The Ministry of Environment of the Czech Republic is chairing the Sofia Initiative on Economic Instruments (SIEI). The Regional Environmental Center provides secretariat support to the implementation of the SIEI. The wider goal and purpose of the SIEI is to support CEE and NIS countries in making more effective use of economic instruments for environmental protection by:

- Facilitating the exchange of experience and information on economic instruments;
- promoting steps which lead to closer integration of environmental and economic policies;
- raising awareness of the potential and the benefits of green budget reform.

The following project activities are/have been carried out:

1. Sourcebook on Economic Instruments

Comprehensive reference material on economic instruments in 14 CEE countries is created. This publication is useful for cross country comparison, bilateral experience exchange, policy making and further research. The material will present achievements and will also allow for identification of key challenges and needs of CEE countries in this area.

2. SIEI Expert Meeting held on 16-17 April, 1998, at REC Szentendre

Conclusions from the sourcebook were discussed, trends in the use of economic instruments were analyzed for this report, and possible elements of a work program for the SIEI after the Aarhus conference were identified.

3. Electronic Newsletter on Green Budget Reform

Up-to-date information on issues related to green budget reform are produced and placed on the web as well as distributed via an email distribution list. The information produced includes reports on challenges and achievements related to green budget reform in the CEE and NIS region, reviews of Western experience with green budget reform, and reports from conferences and workshops.

4. Reports on Policy Integration and Green Budget Reform in Local Languages

Reports in local languages of 5 CEE countries will be produced in late 1998 summarizing and discussing the most recent knowledge and experience on green budget reform and the potential benefits of better economic-environmental policy integration. The aim is to increase the awareness of key stakeholders on the issue and to contribute to increased discussion outside environmental circles. The target groups are political and business decision-makers.

Related to the SIEI, the UN/ECE/OECD workshop on the role of economic instruments in integrating environmental and sectoral policies was held in Pruhonice (Czech Republic), October 8-10, 1997. The participants (mostly government officials from countries in transition) were offered practical advice on extending the use of economic instruments to improve the environmental performance of major economic sectors and to promote an integrated approach to economic and environmental decision-making.

Definitions

A distinction between charges and taxes in this report has been made largely by following the EU approach to classification of such instruments: the term "charge" is applied when the revenue from the instrument is earmarked for environmental expenditure; if the revenue is not earmarked for environmental expenditure, the term "tax" is used. Economic instruments described in this report are classified according to the following definitions (following the OECD classification):

Emission charges/taxes: Emission charges/taxes stand for direct payments based on measurements or estimates of the quantity and quality of pollutant discharged. *User charges:* User charges are payments for the cost of collective services, and are primarily used as a financing device by local authorities e.g. for the collection and/or treatment of solid waste or sewage water. *Product charges/taxes:* Product charges/taxes are applied to products that create pollution either when they are manufactured, consumed or disposed of (for example: fertilizers, pesticides, batteries, etc.). Product charges/taxes are intended to modify the relative prices of the products and/or to finance collection and treatment systems. One form which product charges/taxes may take in practice, is that of tax differentiation leading to more favorable prices for "environmentally friendly" products and vice versa. (E.g. car sales differentials as on fuel efficiency, existence of catalytic converter, compliance with emission standards etc.; and tax differentiation between leaded and unleaded fuel). *Deposit refund systems:* In deposit refund systems a payment/surcharge is made when purchasing a product contained in a designated type of product (e.g., packaging). The payment (deposit) is reimbursed when the product is returned to the dealer or a specialized treatment facility. *Marketable (tradable) permits/quotas (also referred to as emissions trading):* Marketable (tradable) permits/quotas are based on the principle that any increase in emission from a given source must be offset by a decrease in emissions of an equivalent, and sometimes greater, quantity. For example, when a statutory ceiling on pollution levels is fixed for a given area, a polluting firm can set up a new facility or expand its activities only if it does not increase the total pollution load. The firm must therefore buy "rights" or permits to pollute from other firms located in the same control area which are then required to abate their emissions by an amount equal to the additional pollution emitted by the new activity. *Non-compliance fees:* Non-compliance fees are imposed on polluters which do not comply with environmental requirements and regulations. They can be proportional to selected variables such as damage due to non-compliance, profits linked with reduced (non) compliance costs. *Performance bonds:* Performance bonds are payments made to authorities in expectation of compliance with the environmental requirements. The bonds are refunded when compliance is achieved. *Liability payments:* Liability payments are made to compensate for the damage caused by a polluting activity. Such payments can be made to "victims" (from chronic or accidental pollution) or the government. They can operate in the context of specific liability rules and compensation schemes (e.g. funds). NB: Neither non-compliance fees, nor liability payment can be construed as fines which are lump sum legal sanctions. *Subsidies:* Under the term "subsidies" all forms of financial assistance to polluters or users of natural resources is understood, e.g. grants, soft loans, tax breaks, accelerated depreciation. Please note, however, that National/Regional/Local Environmental Funds and their support instruments (grants, soft loans, interest subsidies etc.) are not subject to this project.

Disclaimer: Not included in this survey are: (i) charges and taxes on raw materials and natural/mineral resources; (ii) taxes/charges related to agriculture and forestry (such as land use charges, tree cutting charges etc.); (iii) environmental subsidies from state/municipal budgets, environmental funds etc. (grants, soft loans etc.); (iv) subsidies in the sectors transport/energy/agriculture which have a distortionary effect from an environmental policy

point of view.

A note on non-compliance fees: Non-compliance fees are widely used in CEECs. Some of them have the character of pollution charges with the functions of both revenue raising and compliance and with the revenue earmarked for environmental expenditure through environmental funds (Bulgaria, Hungary). In other countries, non-compliance fees are used strictly as a penalty instrument (for instance in Croatia, FR Yugoslavia) with fixed, non-dynamic rates - these instruments are not described in detail below as they should be seen as command and control instruments rather than economic instruments (they are listed in table 1, though). In a third group of countries, non-compliance fees are used in a system together with emission/effluent charges (Czech Rep., Estonia, Latvia, Lithuania, Poland, Slovak Republic) - here the non-compliance fees have mainly a compliance function but the revenue is usually earmarked for environmental expenditure through environmental funds. These instruments are described together with the corresponding emission/effluent charges below.

1. Introduction

The use of economic instruments in an environmental policy measure has long been promoted by economists. The major advantage of economic instruments is, in theory, that they incorporate environmental concerns directly into the market price mechanism of the market economy. Therefore, these instruments have all the efficiency properties of the competitive market pricing. They trigger actions both among producers and consumers that allow the achievement of given environmental objectives at the lowest costs. The cost saving potential of economic instruments over uniform emission standards or emission reduction has been demonstrated through empirical studies.

The efficiency property of the economic instruments, however, crucially depends on (i) the flexibility of the relevant other environmental policy instruments (ii) marginal cost differentials for different abatement options. If strict emission limits are established for each pollution source - as for e.g. each stack of a plant - there is often only one abatement technology resulting in emission which is in compliance with the standard. There is little legal possibility then for devising abatement strategy according to the cost effectiveness criteria. Therefore, the particular environmental policy context largely determines the efficiency of the economic instrument.

Environmental charges are direct payments of polluters. Therefore, they represent a clear application of the Polluter Pays Principle (PPP). Subsidies may conflict with the PPP, since the principle was originally introduced for curbing the use of environmental subsidies. State aid since those can distort competition and it is regulated at EU level. The concept of PPP evolved and several refinements and definitions appeared. The key element is the polluter's own financial responsibility. It is generally accepted that the scope of such financial responsibility is defined through complying with environmental legislation. Possible exceptions to the required PPP approach are defined both in OECD and EU documents. The common scheme, however, in these exceptions, is that subsidies must be temporary and targeted to specific environmental problems.

From the beginning of the transition to market economy, there have been high expectations for more extended use of economic instruments as environmental policy tools in Central Eastern European countries (CEECs). Related initiatives have been largely supported by environmental economists from OECD countries. Their suggestions for the use of economic instruments to correct pollution problems have sometimes been blocked by existing regulatory institutions in their own countries. They argue that transition brings about institutional changes providing unique opportunities for extended and integrated application of economic instruments.

Surveying CEE countries' application of economic instruments, one may conclude that this advice has been well taken. The list of economic incentives in use is rather long but a closer look reveals several dubious specific sub-optimal features of that list. The aim of this report is to take a real in depth look at actual applications and draw both positive and negative lessons relevant for designing and introducing economic instruments in the CEE as well as in other regions.

2. Economic and Social Context

2.1. Economic Transformation

The notion of sustainable development underlines creates, in general, the important link between environment and economic development. There are, however, conflicting views to what extent environmental quality and natural resource conservation are goods affordable only at high income level or a vital precondition for real economic growth in the lower income countries. This dilemma has been present throughout the transition in CEE countries. Many economic policy makers emphasized the primary importance of growth. While, Some environmental policy makers promoted to take advantage of the unique chance for integrating to build the representation of environmental protection into the evolving market institutions. and reap free environmental benefit from some eEconomic transformation processes has also offered free environmental benefit. have been widely publicised.

This report does not intend to give a comprehensive summary of the transitional path of the economy and environment relationship. The aim of this section is to provide a brief regional overview of some elements of the macroeconomic transformation. These elements are thought of providing the major framework for the introduction and implementation of economic instruments.

Full cost recovery pricing is an important consequence of the PPP. The implementation of the PPP is partially conditional on the ability of the public, private and household sectors to pay for environmental protection. The general pattern in trends the level of the GDP and income figures in CEECs is (i) a phase of recession started around 1990 with the deepest decline around 1991, 1992; (ii) recovery has started from 1993/1994. Major exceptions to this trend are the countries hit by war and Bulgaria where recession still continues. The pace of recovery in the countries fitting into the trend, however, is rather different. In many countries the level of real GDP and wage is still below the level in 1989. Other countries grow at substantial speed but. pPer capita GDP and household income are still well below the average EU figures.

An incentive impact beyond the revenue raising function from the application of the economic instruments can be expected only if property rights are clearly established and prices are set by market forces. Therefore, the status of property right restructuring (privatization) and price liberalization provides the framework and, thus sets the limit for the direct environmental impact of the economic instruments.

By 1997, the scope and extent of privatization and clear definition of related entitlements are in a wide range in the region. Clear definition of property related entitlements has evolved through very different privatization mechanisms. In several some countries large part of the state owned assets are turned into private property, but nbut not all these could claim to have a stable new property structure. In other some countries, privatization process has been slowed down and . mMany large and pollution intensive enterprises remained state owned. Those enterprises regularly receive subsidies in different forms.

In many CEECs, an extensive price liberalization has taken place since 1989. In practice, the extentThe practice of price control remainsstill in force varied across the region. Prices of certain raw materials often remain controlled. Criteria and rationale for price regulation in public utilities and services are often not transparent. Uncertain price setting rules effect provision of services which are relevant for environmental policy areas such as public transport, energy supply, water and waste management services are often not transparent.

Production costs were often not fully reflected in prices. Price subsidies have been often used in CEECs prior to 1989. Price subsidies have been largely removed since then, but several of them have been transformed into more hidden forms. In some countries, energy production remains substantially subsidized (for instance, coal). There is little known about the environmental effect of remaining subsidies in the transport, energy and agriculture sectors in CEECs and related work and research should be initiated.

2.2. Social and Policy Context

Economic difficulties are paralleled with social problems in the transition process. It is hard to foster environmental awareness under such circumstances. A major important issue is for instance the timing of price subsidy elimination. Prices of public services such as health care, education, provision of water were low or free. Similarly, prices of energy for households were low. There were few, if any, taxes on final consumption. Correspondingly, wages were set at a low level. Increase in income for large segments of the population have been well below the price increases resulted from subsidy removal.

Public opinion polls and surveys in the region indicate that people do recognize environmental quality as an important problem. However, they perceive pollution as a state responsibility and expect the state as state responsibility to act against it. Similarly, it is also expected that the state should foot the bill and the ability and willingness including finances. Willingness to pay for environmental quality appears to be rather low.

One of the most important institutional changes has been the decentralization of power and responsibilities. In case of publicly provided environmental services it is likely to create a closer match between local demand and supply of such services. It can, in turn, induce more proper pricing mechanisms for these public services. However, there are some drawbacks to the decentralization process: (i) many of the local authorities lack experience and expertise in designing and implementing environmental management systems; (ii) furthermore, they often lack the financial resources necessary to carry out their new responsibilities in these areas.

EU accession provides the dominating overall policy framework in CEECs. The strength of forces behind this framework may vary across the region but joining the EU is part of each country's short or long term strategy. The prospect of gradual economic integration into the Single Market has already guided private sector development, particularly in countries that have started accession negotiation. Major task for policy makers in the EU approximation is implementing the "acquis communautaire" which means adopting, implementing and enforcing EU legislation and policies in all areas.

3. Environmental Policy Context

3.1. Institutional and Legal Development

Economic instruments are one set of environmental policy instruments. Their impact — as it is already argued - is largely dependent on the surrounding environmental policy setting. Since 1989, some main drivers of environmental policy development in CEECs have been (i) overall political, economic and institutional transformation, (ii) public pressures for safer environment, at least early in the transition period, (iii) international agreements and assistance.

An internationally developed methodology was elaborated for addressing environmental issues in CEECs and presented as Environmental Action Plan for CEE (EAP) in Lucerne. The EAP philosophy emphasizes the need for priority setting across environmental problems and devising cost-effective strategies for solving priority problems. In that framework proper pricing and application of economic instruments as incentive measures have important roles. On the basis of EAP approach, national environmental strategies have been developed in most countries. These reiterated the need for extended use of economic instruments but put most of the emphasis on the revenue raising potential rather than the incentive function.

Between the years of 1991-1996, new environmental legislation was passed in all CEECs. There is usually a framework environmental act and specialized legislation on air quality protection, water, and waste management. Polluter Pays Principle and Precautionary Principle are named as important underpinnings of these legislation. In practice, PPP, however, PPP is almost exclusively quoted in connection with environmental charges, fees and fines. Then, revenues from these instruments, as a general rule, are earmarked into environmental funds. In many CEECs there are separate acts on environmental charges and natural resource fees. Usually environmental policy makers expect a *direct* incentive impact only of one economic instrument and that is a subsidy.

New environmental legislation has been designed in an EU compatible manner from fairly early years of transition. Taking the most developed EU countries as examples has often resulted in ambitiously strict standards and requirements. Meantime, enforcement tools are rather vaguely defined. Low level of environmental awareness and limited environmental information available to public constrain the chance to use public participation and public pressure as effective enforcement tool.

3.2. EU Approximation Context

The general meaning of EU approximation in environmental protection is the same as in any other area. EU environmental legislation must be transposed into the national legislation and implemented. In most of the recent all the EU country evaluations in the frame of Agenda 2000 of the application questionnaire filled by the countries, there was strong reference made to environmental issues. The general observation is that substantial further efforts would be needed, particularly in implementation.

It is often stated that the lack of financing is a major problem in environmental policy in the region. While it is certainly true in a relative sense that the environment is often too low in the policy agenda, still a realistic policy must consider financial constraints. There is no doubt a huge need for environmental investments, especially considering cost estimations for EU approximation. New financing mechanisms should be devised and it should be increasingly based on private financing, but comprehensive environmental funds can play a useful role in the transition. Economic instruments are providing for the main revenue source of most environmental funds established in CEECs. In light of the huge need for environmental investments, new economic instruments are proposed to raise additional earmarked revenue.

It is estimated that about 120 billion ECU are needed for approximation to EU standards in water, air and waste in the ten CEECs with Europe Agreements. On a per capita basis, expenditures on environmental protection may need to raise manifold. The lion's share of financing should come from domestic resources, and increased revenue from already existing and new economic instruments plays an important role here. It reinforces, however, the pressure to concentrate on the revenue raising aspects at the expense of incentive effects which is already present in most national environmental legislation. While official documents often refer to environmental charges as possible instruments to address EU approximation financial needs, few mention the use of economic instrument in flexible manner that would

reduce approximation costs.

Apart from the direct environmental aspects, the approximation process will also bring further EU accession has environmental impact through connecting CEECs to unified market with product qualification systems that takes production technologies into account. fiscal and custom policy harmonization. This offers a chance to eliminate environmentally harmful subsidies but can also affect different forms of subsidies provided for environmental protection, as well.

EU policy on environmental charges and taxes is explained in different documents. There is general emphasis on the need for more extended use in the Fifth Environmental Action Plan, but a more detailed guide is in the Communication on Environmental Taxes and Charges in the Single Market. It states, "This Communication is presented in order to support these activities, and ensure that the environmental taxes and charges are used in a way compatible with Community legislation. The Communication is a first step in the Commission's treatment of the use of environmental taxes by the Member States. ...It also aims to clarify both the possibilities and constraints for Member States to act in this field. ...It shows that there is considerable room for action by the Member States to implement fiscal instruments, while respecting the Treaty obligations."

The EU environmental legislation, however, is dominated by command and control measures. The accession negotiations center on those and seem to leave little room for flexible mechanisms. It is an interesting question for instance whether existing water charges comply with the Urban Waste Water Treatment Directive. For example, some experts think that the Slovenian water effluent charge could be a more cost efficient instrument to achieve the EU standards than the mechanisms mentioned in the Directive. These types of questions should be raised during negotiations.

4. Trends in the Use of Economic Instruments in CEECs

4.1. Use of Environmental Economic Instruments in CEECs

Current applications of the economic instruments in CEECs are presented in Table 1.

The table shows that emission charges and non-compliance fees are very extensively used. Product charges, on the other hand, are in effect only in a few countries. In OECD countries product charges are more often used than emission charges. Furthermore, looking at the more detailed description of the emission charges, we can conclude that emission charges are very comprehensive in CEECs. Each charge covers many pollutants, some air emission charges and/or non-compliance fees as many as 200 pollutants. Exceptions are the CO₂ tax and water effluent charge in Slovenia. Those are more in line with the dominant structure of emission charges in OECD countries, where for instance air emission charges focus on one pollutant, such as SO₂ or NO_x charges in Sweden.

Table 1: Overview on Selected Economic Instruments Used in Central and Eastern Europe (as of April 1998)

	B&H	BUL	CRO	CZE	EST	HUN	LAT	LIT	MAC	POL	ROM	SR	SLO	YUG
Air emissions														
- air: emission charge				•	•		•	•		•		•		
- air emission non-compliance fee		•	•	•	•	•	•	•		•	•	•		•
- CO ₂ tax													•	
Water pollution														
- water effluent charge			•	•	•		•	•		•	•	•	•	•
- water poll. non-compliance fee		•	•	•	•	•	•	•		•	•	•	•	•
- sewage charges		•	•	•	•	•	•	•	•	•	•	•	•	•
Waste														
- municipal waste user charges	•	•	•	•	•	•	•	•	•	?	•	•	•	•
- waste disposal charges				•	•		•	•		•		•		•
- waste non-compliance fees		•	•	•	•	•	•	•		•		•		•
- deposit refund on beverage containers	•		•	?	•	•		•		•	•	•		•
Waste related product charges														
- transport fuels						•								
- packaging material					•	•	•			•				
- batteries / accumulators						•	•							
- refrigerators and refrigerants						•	•							
- lubricants						•	•							
- tires						•	•							
- substances/products damaging ozone layer (CFCs)												•		
- mineral oils							•							
Transport														
- tax differentiation un-/leaded gasoline	•	•	•	•		•			•	•	•	•	?	
- increased imp.duty for used cars or without cataly.	•		?	?		•		•	•	•	•	?	?	
- road tolls/pricing			•	•		•	•		•	•		•		•
- noise/air pollution tax on air travel				•										
Nature protection and biodiversity														
- nature protection non-compliance fees		•	•		•	•		•		•		•		•
Natural resources and mining														
- natural resource or mining tax/charge ¹			?	•	•	•	•	•		•		•		•
- water extraction charges		?	•	•	•	•	•	•	•	•	•	•	•	•
Other														
- income tax/VAT allowances for environ. technol.		?	?	•	•	•	?		•	•	•	•	?	•
- duty/tax allowance on import of environ. technol.		•	?	?	•	?	?	?	•	?	•	?	?	?
Environmental Funds²														
- at national level		•		•	•	•	•		•	•		•	•	•
- at regional level					•					•				
- at municipal level		•						•		•				
- debt-for-environment swap fund		•								•				

Abbreviations: B&H - Bosnia and Herzegovina; BUL - Bulgaria; CRO - Croatia; CZE - Czech Republic; EST - Estonia; HUN - Hungary; LAT - Latvia; LIT - Lithuania; MAC - Former Yugoslav Republic of Macedonia; POL - Poland; ROM - Romania; SR - Slovak Republic; SLO - Slovenia; YUG - Federal Republic of Yugoslavia; ? = unclear whether such an instrument is in force at present.

Notes: 1) Only those natural resource or mining taxes/charges are reported which were introduced partly for environmental reasons or if part of the revenue is earmarked for environmental expenditure. 2) According to some classifications, environmental funds are seen as an economic instrument for implementing environmental policies. Environmental funds are not analyzed in this report, however.

The use of emission charges and non-compliance fees in CEECs originates in the 1970s and early 1980s. In the economic and institutional context of centrally planned economy, the charges did not play an effective incentive role. The soft budget constraint for state owned enterprises meant that the extra financial burden of an environmental charge was more or less covered by additional money from the state. That was clear also to the environmental policy makers in these countries. They did not really intend to use them for any incentive purposes. The major function was to raise revenue into earmarked funds (national and local). These funds were needed because their subsidies constituted the only effective enforcement tool in the hand of the environmental authorities at that time.

Environmental charges were institutionalized when the political and economic transformation started. In the period of emerging market economy, the costs and profit implications of the charges became real and it required political strength to re-establish the charge level. Poland was particularly successful at increasing charge rates although it is also argued that the impact in Poland is limited. In most CEECs, it is suggested that direct incentive impact is limited. In most of the countries major effort was to maintain the real value of the charge rates and the structure was left largely untouched.

Emission charges are used in connection with the permit system. In fact emission charge rates have two tiered structure. Base rate applies to emission below the permitted level and a penalty factor for emission above that level. In most countries, there is a system of permit — emission charge — non-compliance fee for controlling air and water pollution and hazardous waste.

Non compliance charges are also widely used in CEE countries. Their function, theoretically, is to deter polluters from violating standards. In practice, however, these fines are set too low compared to the cost requirement of the actions they were supposed to trigger.

Many emission charge systems and a few non-compliance fees include the possibility for full or partial exemptions from charge payments. Charge waivers can be obtained for a certain period of time if the polluter undertakes some abatement investment.

Tax differentials encouraging the use of unleaded gasoline are in place in about half of the countries. These are used in connection with fuel standards and measures encouraging the change in the car fleet. In several countries, there is favorable consumption tax rate on unleaded gasoline and vehicles with catalytic converters. There are also preferential rates for cars with catalytic converters in the annual vehicle tax payments.

Product charges are the emerging set of new instruments. Many of them are being planned in the region. Presently, product charges are applied only in few countries (Hungary, Latvia, Estonia, Slovakia). It is interesting to note that they are most extensively used in Hungary where no emission charges are in force. Some of these charges are connected to some specific environmental problem, such as increased volume of waste from packaging material. Still these charges are mostly revenue raisers for earmarked environmental fund.

4.2. Efficiency and Effectiveness of Economic Instruments

Many of the economic instruments have been in place since the 1980s, so there are years of experience with them in the transition period. In spite of that, only few attempts are known to evaluate the impact of these instruments. Both OECD and EU Commission recommend the assessment of how economic instruments operate on regular basis. Acknowledging the complicated nature of such a task, guidelines and methodologies have been elaborated.

Evaluation of the economic instruments in CEECs has added difficulties.

- Most of the emission charges and some of the product charges have been designed parallel to the operation of the permit system. There are only few cases in which specific environmental objectives were set beyond the emission limits for the charges. Their evaluation can not be separated from the performance of the permit system.
- Economic and industrial restructuring with its recession period impacted emission and environmental quality. That effect also intermingled with the operation of the economic instruments.
- Being utilized mostly as revenue raisers, direct economic and distributional impacts of the charges are largely changed via their earmarked spending. Therefore a full impact analysis must cover the assessment of this spending.

Economic efficiency criteria would require unit pollution charge rates to be set in correspondence to the marginal environmental damage associated with the particular pollution. For emission charges, the relative differences in rates of different pollutants usually are correlated with differences in pollutants' toxicity or its potential to cause environmental damages. In case of the Hungarian product charges the revenue-raising objective was more prominent. There were some expenditure plans made and unit charge rate was then correlated with them. The level of unit charge rate, at the end, set at the politically acceptable level.

The design and institutional arrangements of implementation makes it unlikely that environmental charges can directly induce efficient abatement strategies. Under these arrangements, Efficiency theoretically can be achieved through efficient spending of the charge revenues.

The question arises then whether we can expect any environmental impact making these charges at least effective. Empirical observations show that in some cases, for e.g. Polish air pollution charges, there are incentive effects even if not at the efficient level. In Hungary, the packaging product charge had substantial environmental impact in the preparatory phase. Since the intention for introducing the charge was strong signal that packaging waste were high in the environmental policy agenda, the bigger multinational companies did start their own preventive and recycling measures. They could not afford to ignore the public relation and marketing impact of being perceived as not caring for the environment.

The impacts of charge exemptions are much debated. Charge waivers can certainly largely enhance the incentive effect if conditions for exemption are well defined and strictly enforced. Failing to enforce the requirements can result in severe distortions and surprising revenue decline.

Effectiveness of the environmental charges has been threatened by inflation in all countries. There have been different approaches implemented to protect the real value of the charge rates. In few countries (for e.g. Poland, Estonia) charge rates are indexed. In some other countries they are regularly changed. In Hungary, product charge rates are reviewed and revised in connection with the annual budget.

4.3. Administration and Enforcement

Non compliance fees and emission charges - with the exception of the Slovenian CO₂ charge - have a complicated structure. They were originally designed to deal with a limited number of larger state owned enterprises. As budget constraints started to be effective and many smaller enterprises mushroomed, payment collection became more difficult. Reported payment collection efficiency remains to be a weak element in the implementation of charges and fees. Only in few cases the collection efficiency can be considered as satisfactory. Payment evasion is much more significant where non-compliance fee rates are high.

Administration of emission charges and non-compliance fees are mostly integrated into the permit system wherein environmental authorities collect charges. The additional administration requirements for the charge system are generally not too high. But the enforcement problems in the permitting process automatically appear in the emission charge system. Charge systems are based on self-reported emissions that are checked as part of monitoring compliance with permitted emission. Such monitoring is rather weak in most of the countries.

Product charges also required new administrative procedures. The complicity of the administrative structure and correspondingly the effectiveness of enforcement are different for each product charge. Tax collection authorities collect most of these product charges. The closer the structure of product charges is to an excise tax, the closer the collection efficiency to the regular tax collection efficiency. Transport fuel product charge has been very effectively enforced in Hungary. In many cases once the necessary administrative framework is implemented, the relative administration cost is declining.

Exemptions from charge payments tend to create enforcement and payment collection difficulties. For product charges it can be particularly problematic that exemptions are authorized and monitored by environmental authorities while tax authorities collect payment. Establishment of regular communication procedures becomes important.

The implementation phase of new instruments often brings surprises. The need for carrying out studies to understand complex economic and business linkages is sometimes recognized after the first phase of implementation. It underlines the importance of proper preparation even if political climate seems to offer quick chance for introducing a new economic instrument.

4.4. Use of Revenue: the Issue of Earmarking

Environmental charges, taxes and fines offer revenue sources that are earmarked for environmental funds in most CEECs. Earmarking is a much-debated issue. Environmental policy makers still perceive it as an important mean to secure necessary finances for environmental protection. It can be also the result of gaining political acceptability.

The use of the eEnvironmental fund for subsidising pollution abatement may be justified under the definition of the Polluters Pay Principle, as long as its revenue base is environmental charges, taxes and fines (Zylicz, 1993) By making polluters as a group responsible, earmarking of environmental taxes and charges can function as mechanism for recycling funds from polluters in general to the polluters responsible for activities requiring remedial action on a priority basis. In that way, in fact, the efficient property of the environmental charges may be retained.

Earmarking environmental charge revenues has been practiced in OECD countries, as well. Examples can be given mostly in the field of water quality management. Water effluent charges are earmarked for financing water pollution abatement through water management funds, for e.g. in France and the Netherlands. The unique features of earmarking in CEECs is that charge revenues are channeled into comprehensive environmental fund(s). They provide financial assistance for very wide range of measures including pollution abatement (air, water soil), nature conservation and establishment/extension of monitoring networks. While many debates surrounds whether or not environment funds are sound concept from economic and public finance perspective, their widespread use in transition economies are grounded in very real interests.

Environmental funds' operation must certainly undergo some examination in the context of EU harmonization. Subsidies provided by the funds constitute state aid, which is strictly regulated at EU level. Community guidelines on State aid for environmental protection (94/C72/03) indicate under what circumstances subsidies for environmental protection are compatible with Community rules on state aid. The present setting of the environmental funds could be streamlined according to the community guidelines if their operation were based on well-defined specific spending programs.

It is important to note that the exemption from environmental charges also constitute state aid (Communication from the Commission). Therefore, charge waivers schema must be defined in accordance with the Community guidelines (94/C72/03).

4.5. Acceptance of EIs among the Public and Enterprises

Predecessors of the present charge systems were introduced in the central planning context where the most important hurdle was to persuade the political leaders. Once the centralized political system accepted the emission charges or non-compliance fees, enterprises did not object too much. Since the consumption goods prices did not really reflect production costs at that time, households were largely protected from the potential price impact of the charges. Therefore public negotiations were not part of the original preparation of the charge systems.

The extent and difficulties of preparation and interest reconciliation was somewhat surprising to environmental policy makers when revisions and new instruments had been initiated. Environmental regulation, including economic instruments, imposes real costs on privatized companies. Companies, in turn, can devise well-informed and powerful strategies to block new economic instruments.

On the other hand, the business sector can also be a powerful ally if they see advantages of economic instruments over command and control regulation. For example, the introduction of the product charge on refrigerators in Hungary was supported by the big refrigerator manufacturers and importers as long as the charge revenues were earmarked for subsidizing the phase out of ozone depleting refrigerants. The reason was that these companies did not trust the capacity of the environmental authorities to enforce the strict regulation on phasing out ozone depleting refrigerants by smaller importers. They trusted more the tax and custom authorities to collect the charge from those smaller companies.

Households are also more sensitive to new taxes or charges. They are not protected anymore from their price impact. Information on the particular environmental problem, structure of the planned instruments and alternative consumption options has become very important.

The main lesson from the preparation and negotiations of the newly introduced charges is that the government must consider new forms for articulating the interests of affected parties. Environmental policy makers have to be prepared to formulate their proposals in a fairly complicated process that is sometimes dominated by strong economic pressure groups. Experience also shows that negotiations are often not based on sound professional assessments. Some options prevail not by the strength or efficiency of their environmental impact but through their political appeal.

5. Special Issues

5.1. The Fiscal Policy Context: Eco-Taxes

In OECD countries, the trend in the use of economic instruments is to integrate environmental externalities into the overall fiscal system. This is done by (i) replacing revenues from distortionary taxes (mostly taxes on labor) with environmental tax revenues; (ii) eliminating environmentally harmful tax exemptions and subsidies.

EU Communication on environmental taxes and charges states: "4. Revenues from environmental taxes and charges can be used to finance environmental protection activities. In some cases, these instruments can also provide large and stable revenues. They can then be used to decrease other taxes which are perceived as distorting the economy, such as labor taxes"

Considering the extensive set of environmental charges and still numerous subsidies in different economic sectors the possibility of such eco-tax reform may be present in CEECs. The Slovenian CO₂ tax can be seen as one step in that direction. There are some very preliminary discussions along that line in Hungary.

Present reality, however, likely limits the scope for eco tax reform in the region. Overall tax burden is high but so is tax evasion. Therefore predicting the impact of reducing labor tax rates is very difficult. There are only few environmental charges in the region which raise enough revenue to be seriously considered for a revenue switch. Earmarking is also incompatible with the eco-tax shift. Careful preparatory steps, including detailed analysis, are most likely to happen in short term. Depending on their results, some new instruments, particularly in the field of energy taxes, could emerge in longer run.

5.2. Cost Coverage of Public Services through Prices (water, waste management)

Waste water and waste management is named in most country evaluations of Agenda 2000 as areas that need particular attention. Investment need for complying with the relevant EU directives give the bulk of total environment related costs of EU accession. Moreover, these are services largely provided by companies in the public sector. Special financing mechanisms must be designed to address these specific features. Subsidy elements are likely part of those mechanisms but still commercial borrowing components must be substantial. Bank loans can be taken only with well-planned repayment schedule which need to rely on revenues from service charges.

Cost recovery pricing for publicly provided services is a difficult political issue. Establishment of basic wastewater collection infrastructure was heavily subsidized in many EU countries, and then there was a gradual movement toward full cost recovery pricing. CEECs must also develop a feasible longer term financing strategy for developing their municipal waste water and waste management infrastructure.

The households' willingness to pay for such services is generally described as low. This is certainly not true for all components of the services in all areas. Decentralizations of these services have many advantages but it can also create efficiency problems. Economies of scale can not be exploited if each small municipality is required to have their own waste disposal site or waste water treatment plant.

There are several models for public-private partnership for providing waste water and waste management services. The key element in any of these is the commitment to proper pricing. It is rather difficult to collect information on user charges for a regional survey. The little information gathered suggests that user charges have been established in most countries. Their level, however, is not high enough to cover the full cost.

6. Conclusions

The set of economic instruments used in CEECs has undergone substantial changes over the years of transition. Charge rates were changed, enforcement mechanisms were adapted to accommodate property right and composition changes in the business sector, and some new instruments were introduced.

Little effort can be observed in changing the basic de facto role of the economic instruments. They still play overwhelmingly revenue-raising purposes and capitalize environmental funds. In some cases, alternative economic instruments, which could address a given environmental problem more effectively and efficiently, are ignored and environmental charges are favored due to their revenue raising potential. Instruments such as deposit refund systems, bubble policy, tradable permits still have unused potential in the region.

EU accession is becoming the overriding framework for designing environmental policy in most of the CEECs. Since EU environmental legislation is dominated by command and control approach, most of negotiations center around transposing technological and emission limits. Meanwhile, inside the EU, there is an increasing recognition that the costs of compliance is becoming prohibitive and in some member states non-compliance is present. Several new environmental policy initiatives are under discussion which aim at introducing more cost-effective approaches into the Community policy. Many of these call for more extended application of economic instruments. It would be very important to incorporate these new waves of environmental policy into the accession negotiations.

No doubt even with more flexible instruments, the financial burden of EU harmonization is so high that the rational environmental policy approach must be well designed and implemented in phases. Economic instruments, for e.g. bubble policy, incentive charges, and performance bond, can efficiently support such policy goals.

The perspective which considers economic instruments only as means to raise money for additional financing of EU accession should be avoided. However, well-designed and functioning environmental funds can efficiently enhance the impact of charges. A set of clear requirements could be established in the negotiations on the basis of Community guidelines on State aid for environmental protection. Those requirements could replace ad hoc approaches toward the function of environmental funds in the pre accession process.

Political wills, negotiations, clear definition of the targeted environmental problem and proper preparation are important for the introduction of the economic instruments. Successful implementation usually requires simple charge schema and administration structure, at least at the beginning.

There are only few examples in the legislation on any economic instruments that require regular and systematic monitoring and evaluation of the instrument performance. Planning for ex post evaluation can bring forward important issues even in the preparatory phase of designing an instrument. Furthermore, such evaluation can highlight important lessons for further development of the policy measures.

7. Elements for a SIEI Work Program for the Period after Arhus

The SIEI Expert Meeting held 16-17 April, 1998 found the work carried out under the present work program of the SIEI very useful and concluded that the momentum created should be carried on after the Arhus Conference in a new SIEI work program. The participants concluded that the established network of economic instruments experts from CEECs could serve as the basis for future work and could take the form of a SIEI Working Group. The participants suggested to the Chair of the SIEI and to the SIEI Secretariat to consider several areas for future work which would build on the progress achieved so far. Considering the strong demand of the meeting participants for possible future SIEI projects, a prioritization was necessary. Generally, participants thought that after elaborating comprehensive overview information on a regional level, the focus in the new work program should be on concrete analysis, evaluation and recommendations which are directly useful for policy makers at the national level, rather than concentrating on general recommendations on a regional level. On the regional level, the focus should be on continued experience and information exchange. The new SIEI work program should combine these two elements.

ANNEX

Detailed Information on Economic Instruments Used or Proposed in CEECs

A1. Air and Noise

A1.1. Air Emission Charges and Taxes

See Table A1 below.

A1.2. Noise Emission Charges and Taxes

Bulgaria	–	Noise pollution fines are enacted but not enforced in Bulgaria.
Croatia	–	Noise pollution fines are enacted and can be levied if noise protection legislation is violated.
Hungary	–	Pollution fines on noise and vibration are enacted. The fine is enforced in areas well-known for disturbing noise pollution and in case of complaint. The fine is calculated based on a complicated formula which takes into account exceedance of noise standards, number of rooms in buildings that are affected by the noise pollution and regional factors. The total revenue from this fine in 1996 was 0.13 mln USD.
Slovak Republic	–	Noise protection is focused on preventive measures according to the Act on Health Care (1994), where health offices may prohibit the operation or import of equipment which exceeds the allowable level of noise (85 dBI). Also, health offices may impose penalties for violation of the Act depending on the level of noise disturbance. Health offices may establish compensation fees for workers exposed to higher levels of noise pollution (e.g. in aviation or heavy machinery sectors).
FR Yugoslavia	–	Noise fine: according to law, an enterprise or legal entity can be fined USD 2500 max. if it puts into circulation sources of noise or uses and maintains them contrary to the prescribed standards.

A2. Transport

A2.1. Gasoline and Diesel Pricing

See Table A2 below for tax differentiation between leaded and unleaded gasoline.

A2.2. Vehicle Related Taxes and Duties

Bosnia & H.	–	Import of vehicles: no tax/duty differentiation with environmental relevance.
	–	Car registration: part of the registration fees is a 1DEM "water protection refund".
	–	Car insurance: cars using unleaded fuel receive a 10% discount.
Bulgaria	–	Import of vehicles: An import tax on used cars in the amount of 10% existed until 1996. Now, there is no tax/duty/differentiation with environmental relevance.
	–	Annual vehicle tax: is dependent on engine power and provides allowance for cars with catalyzers.
Czech Republic	–	A road tax is enacted and has to be paid based on engine capacity (cm ³) and/or vehicle weight. Exempt from the Road Tax are vehicles used in urban public transportation and vehicles used exclusively for combined transport (road-rail) if road component < 50km and electrically powered vehicles. The total revenue from the road tax was USD 134 million in 1997.
Estonia	–	Motor vehicle excise duty: For political and social reasons; there is little environmental logic in this duty. For the part of excise based on age, new vehicles pay the same tax as 10-year old vehicles (the excise tax is ca. 70 USD). For used vehicles aged 1-12 years 7 USD must be paid per year, for vehicles aged over 12 years: 85 USD + 11 USD x number of years over 12. Estimated total revenue of the motor vehicle excise in 1997 was 9.3 mln USD.
	–	There is also an annual motor vehicle tax and registration charges. The motor vehicle tax is part of municipal taxes and implemented only in two municipalities at present. There are no special allowances for environmental purposes.
Hungary	–	VAT has to be paid on purchase of vehicles and on vehicle equipment (the standard VAT rate of 25% applies). For some equipment with environmental relevance (catalytic converter, thermal re-burner, exhaust gas filter) the preferential tax rate of 12% applies.
	–	Consumption tax has to be paid on the purchase of cars. The tax rate is preferential in the case of small cars, cars with low fuel consumption, electric cars and cars with catalytic converters. The incentive effect for buying cars with built in catalytic converter is evident, especially for cars in lower price categories.
	–	Import duty has to be paid when vehicles are imported. Import duty on trains is lower than on other vehicles. Concerning cars, the environmental relevance is evident: rate is preferential in case of new or cars less than four years old, small cars, and, cars with catalytic converters. There is also some environmental relevance in case of lorries: the rate is lower for waste collecting vehicles and other vehicles for special purposes, (e.g. road sweeping car). There is also differentiation between new and old used lorries.
	–	The annual vehicle tax has to be paid for domestic and foreign cars. For domestic cars, the tax base is the weight of the vehicle, and, in case of lorries, the weight plus 50% of the load-carrying capacity. The tax currently varies from USD 2-4 for each 100 kg. Tax exempt are: budgetary organizations, the church, penal authorities, social organizations, foundations, local and regional public transport, motorbikes under 250 cm ³ , cars transporting handicapped people, vehicles for commuting purposes, agricultural tractors, and vehicles under international agreement. A preferential tax rate applies for cars with built-in catalytic converters (50% of the tax has to be paid) and cars subsequently equipped with catalytic converter (75% has to be paid). In case of lorries which meet UN-EC regulations on air pollution and noise emissions, favorable tax rates should be paid (50% or 75%). In case of combined freight transport, the tax is also favorable (50-80%). For foreign cars, the tax base is the time of stay in Hungary in days. There is a tax holiday for the first 60 days. For lorries the calculation base is the weight plus 50% of the load carrying capacity and the kilometers done.
	–	There is also a registration fee in force as well as a fee for emission control (compulsory every 3 years and in case of motor change).
	–	Three vehicle related and environmentally motivated product charges are in force: the product charges on fuel, tires and batteries. These product charges are described in more detail in table A9.

- Lithuania
 - Import of vehicles: the VAT (18%), a customs tax (5% for cars 7-10 years old, and, 10% for cars > 10 years old), and, an excise tax (15% for cars < 5 years old and with a value of > 15000 USD) have to be paid. This tax system provides for incentives to import new and small cars: total taxes for importing a car > 10 years is 28% while the import of a small car < 5 years old is taxed at 18%.
 - There is no annual vehicle tax for passenger cars and no tax for vehicle registration. However, an annual tax should be paid by owners of light duty vehicles, heavy duty vehicles and special road vehicles. Exempt from the tax are vehicles that belong to the Defense Ministry. The tax rate varies from USD 25-750 per vehicle according to weight. Total revenue in 1997 from this tax was 6.0 mln USD. The revenue is channeled to the Road Fund and used for modernization and repair of existing roads and construction of new roads.
 - A tax is levied on light and heavy duty vehicles and for buses which are registered abroad. The tax rate is USD 20-100 depending on vehicle type and weight. Exempt are vehicles which are registered in countries that have international agreements with Lithuania, as well as vehicles of charity organizations. The 1997 revenues from this tax in 1997 were about 0.14 mln USD and channeled to the Road Fund.
- FYR Macedonia
 - Another tax is levied on vehicles whose dimensions, axle load and/or weight exceed the standards fixed in law.
 - 2% allowance on car imports for cars with catalyzer
 - Charges ("as basic insurance deductions") are existing on vehicles. The revenue from these charges are channeled into the Fund for Environment and Nature Protection. For passenger cars, the charge rate is 2% for cars with catalyzer; 3% for cars without catalyzer; 4% for cars without catalyzer or diesel cars older than 10 years; 10% for cars using a fuel mixture of oil and leaded gasoline and motor oil (two-cycle engines). For freight vehicles and public transport vehicles, the charge rate is 3% for diesel vehicles with catalyzers; 5% for diesel vehicles without catalyzer; 10% for diesel vehicles older than 10 years; 15% for diesel vehicles older than 20 years. For aircrafts, the charge rate is 5% of the airport tax for landing and take off. In case of roads whose use is priced, 20% of the toll makes and income of the Fund for Environment and Nature Protection.
- Romania
 - 30-40% allowance of the tax and indirect charges for less polluting vehicles
 - From January 1, 1998, import duties for autos equipped with catalytic converters have been lowered relative to automobiles without catalyzers. Custom taxes on imported autos are about 20% of the retail price. The import of autos more than 8 years old is dejected because these cars are not allowed to run on the Romanian roads. Unfortunately, one-half of the automobile stock is at least 15 years old and their emission heavily pollutes the population.
 - Individuals and state or private companies pay the tax for vehicles having mechanical traction and for water transport vehicles. The tax is established depending on the cylindrical capacity of the engine (from 15'000 to 60'000 lei/year). The tax was introduced to increase local government income and to raise funds for the development and maintenance of public roads network.
 - A special fund for public roads is established and has the following revenue sources:
 - ◇ 25 % from the domestic (made in Romania) fuels (gasoline and Diesel oil) retail price (excluding excises);
 - ◇ 25% from the custom value of the imported fuels;
 - ◇ 10% from the domestic autos (all kind including trailers) retail price (excluding excises);
 - ◇ 10% from the custom value of the imported autos;
 - ◇ 5% from the tractors and agricultural machinery retail price.
 - This fund has 65% of its revenue earmarked for national roads and 35% for local and county roads.
- Slovak Republic
 - According to the Act on Road Tax (1994), each commercial vehicle is subject to a road tax. The rate of the tax depends on the engine volume in cm³. For private cars, no road tax applies. Commercial vehicles equipped with catalytic converters, liquid propane gas or compressed natural gas engines receive a 50% reduction in the basic charge in the first two years following the purchase of the commercial vehicle. In addition, for commercial vehicles with environmentally friendly characteristics, the following tax exemptions for the following classes of vehicles exist: collection of municipal waste; public transport; vehicles on electric or solar engines; and, combined transport in 50 km distance. Also, a reduction from the payments may be made in situations where combined transport has been used (roads - railways, or water way).
- Slovenia
 - A road tax is in force which is differentiated according to engine volume in cm³ and type of engine (spark ignition, diesel). The road tax has to be paid annually and revenues go to the "Company for Highways of the Republic of Slovenia" and are used for highway construction.
 - A "gasoline Tolar" was introduced in 1994 to create revenue for highway construction. The revenue forms the major income to the "Company for Highways of the Republic of Slovenia".
- FR Yugoslavia
 - The custom duty for the import of new cars is depending on engine size; the average duty is 28%.
 - A turnover tax of 16% on vehicles is in force.
 - The registration charge is approx. USD 200 and includes administrative charges, communal taxes, the road tax and vehicle insurance.
 - The wholesale tax for used cars is determined according to the estimated value of the car and depends on the engine size and age of the car.

Note: Information has not been provided for Croatia, Latvia and Poland.

A2.3. Road Tolls/Pricing

- Croatia
 - Road tolls exist for highways. The amount is ranging from \$1 for two-axed vehicles and shortest road section traveled to \$50 for four-axed vehicles and longest distances traveled.
- Czech Republic
 - A highway toll was introduced in 1996. Each car entering the highway has to be equipped with a highway toll sticker. The sticker price increased from 400CZK to 800CZK (USD 23) in 1998. The revenue is used for highway repair, reconstruction and buildings. Total revenue to the state budget: 1996 - 34 mln USD; 1997 - 29 mln USD.
- Hungary
 - Road tolls are currently levied on two highways M1 and M5. Both highways are operated by concession companies. The current toll for single use on M1 for motorbikes, automobiles, small lorries and minibuses is USD 0.15/km; for vans USD 0.37/km and for buses USD 0.58/km. Preferential prices are available for multiple use, for freight transport firms, and, for inhabitants of neighboring settlements. The toll rates are high; in 1997, 80% of the users of the priced highway section were foreigners and 93% automobiles or small lorries.
- FYR Macedonia
 - A road toll has to be paid on roads of the first degree. Exempt from the toll are diplomatic cars, and cars of the Army and the Government. Foreigners pay doubled rates. For example, for private, domestic cars the toll is USD 0.35 - 1.10 per trip on various roads of the first degree with distances of 23-31 km; for trucks these rates are USD 1.80 - 4.35.
- Slovak Republic
 - In 1996, road tolls were introduced for the use of highways. The rate depends on the engine volume and revenue is paid to the State Fund of Road Development. For private cars the toll ranges from USD 6-11.
- Slovenia
 - A road toll has to be paid at the entrance of highways according to type of vehicle. Total revenue from the toll in 1995 was USD 31'000.--.

A2.4. Taxes on Air Travel

- Czech Rep. At the Prague airport Ruzyni, noise pollution charges are levied based on the mass of a plane landing. The yearly revenue is ca. 0.8-0.9 mln USD and is used for monitoring. It is planned to increase the charges to create revenue for financing noise protection installations in villages surrounding the airport.
- Lithuania There are no direct environmental charges/taxes on air travel in Lithuania, but the air emission charge and non-compliance fees apply also for airports. Basis for charging are emissions during the landing - take off cycle of airplanes.

A3. Water

A3.1. Water and Sewage Prices

See Table A3 below.

A3.2. Water Effluent Charges and Taxes (in addition to sewage charges)

See Table A4 below.

A4. Waste

A4.1. User Charges on Municipal Waste

See Table A5 below.

A4.2. Waste Disposal Charges and Taxes

See Table A6 below.

A4.3. Waste-Related Product Charges and Taxes

See Table A7 below.

A4.4. Deposit Refunds

- Bosnia & H. A few local beer factories use a deposit refund system for part of their production (glass bottles). Estimated percentage of bottles returned is 70%, however, the market share of these products is < 10%.
- Croatia A voluntary deposit refund system on glass bottles exists.
- Estonia Currently a deposit refund system is introduced on alcohol and soft drink packages on the basis of voluntary agreements with industry and importers. At the end of the 1980s there was an operational and efficient deposit-refund system in Estonia which collapsed with the introduction of not sufficiently regulated free market principles. The establishment of package excise in 1997 had a powerful impulse to re-introduction of the deposit refund system in conformity with market rules. More than 50 per cent of alcohol and soft drink packages were collected in 1997. The deposit refund is used for glass, ceramic, metal and plastic packages of the alcohol and soft drinks. Uniform deposits have not been established by the Government yet. The prices have been determined by the market and they vary between 25 per cent and 50 per cent of the excise rates. The deposit refund system of bottles and bottle-like packages operates rather efficiently in spite of its incompleteness. There are a lot of collection mediators. Many of manufacturers and importers have been exempted from the excise tax. Consumers, being aware of environmental protection requirements, are eager to re-sell their used packages despite of their low prices. (see also table on "product charges" on the Estonian packaging material excise).
- Hungary A deposit refund system on glass/plastic bottles has been in force for decades. 1988-90, a system of fixed rates was in force. Since 1990, the rates depend on voluntary negotiations between industry and retailers. According to new regulation, traders (both retail and wholesale) are obliged to refund packaging which is subject to the deposit refund system, but the enforcement is missing. The most common types of bottles (wine, beer, soft drinks) always had about a 70-80% return rate. Since 1991, the return rates decreased (except for beer bottles) to about 50% (estimates). The trend is that the system works only for such types of bottles for which the refilling is economical. Current deposit rates (with % of deposit in products market price) are as follows: 0.75 l wine bottles made of glass: 5 US Cents/bottle (<3%); 0.5 l beer bottles made of glass: 5 US Cents/bottle (6-8%); 1.5-2 l soft drink bottle made of plastic: 15-35 US Cents/bottle (30-40%).
- Lithuania A deposit refund system on beer bottles and some other types of glass bottles is in force based on a voluntary agreement with industry. The system was introduced in Soviet times. No specific studies of the systems' efficiency has been performed but according to the Association of Lithuanian Breweries, the total amount of beer bottles in circulation in the Lithuanian market is 15 million, from which 8 million are discarded to waste annually. Therefore, despite of the fact that both, producers' and consumers' views on the system is positive, the system needs improvement. New legislation on deposit refunds is being drafted by the Ministry of Environmental Protection.
- Poland There is a deposit refund system in place on beverage containers. It includes 0.5 l beer bottles made of glass (deposit rate as of 05/96: 0.15US\$/bottle which represents 14-20% of the products market price); 0.25 l soft drink bottles made of glass (US\$ 0.07/bottle = 21-27% of market price); 0.33 l soft drink bottles made of glass (US\$ 0.07/bottle = 20-24% of market price); 1 l soft drink bottles made of plastic (US\$ 0.19/bottle = 21% of market price); 1.5 l soft drink bottles made of plastic (US\$ 0.22/bottle = 19% of market price); 2 l soft drink bottles made of plastic (US\$ 0.37/bottle = 23-34% of market price). Current deposit rates do not attract consumers for effective collection and the system covers only a small range of glass and plastic containers available in Poland.
- Romania A deposit refund system for beverage containers is in place operated by the private sector.
- Slovak A deposit refund scheme exists for glass and plastic bottles. The deposit is approximately 0.14 USD per bottle (1 l wine or 0.5 l beer) and 0.29 USD per plastic bottle (2 l soft drink). The return rate is very high because of the long history and use of this program.
- Republic A deposit refund system on glass bottles exists for decades. The system has been introduced on voluntary agreement with industry. There was no analysis so far on the effectiveness of the system or on the market share of products under the system.
- FR Yugoslavia

A5. Nature Protection and Biodiversity

A5.1. Nature Protection Charges and Taxes

- Bulgaria – Entrance fees for visiting some of Bulgaria's nature protected areas are planned.
– Fines can be sanctioned for breaking the Nature Protection Act.
- Croatia – Fines can be sanctioned for breaking the Nature Protection Act. Fines up to USD 30'000 can be imposed.
– Entrance fees for visiting some of Croatia's nature protected areas can be levied.
- Estonia – A nature protection non-compliance fee is in force. The fee is established as compensation of damages to the wildlife (illegal collection, catching, hunting, gathering etc.). The revenue goes to the Estonian Environmental Fund. Total yearly revenue varied between 0.01 and 0.15 mln USD. Revenue leaders are illegal fisheries and hunting.
- Hungary – A nature protection non-compliance fee is in force which can be levied on individuals and firms violating nature protection legislation. The level of fees depends on the category of protection of an area where the law was violated and on the degree of damage/violation. The law defines maximal fee rates. Multipliers apply in case of repeated violation, in case of irreversible damages or if the survival of eco-systems is endangered. Before the enactment of new nature protection legislation in 1996/7, the fee was very ineffective and revenues very low (< USD 0.02 mln/year).
- Lithuania – Non compliance fees for nature protection are in force. The fee can be levied on the following activities: 1. non-compliance with rules on recreational and commercial fishing and fish protection; 2. compensation for damage done to the hydrobiota; 3. Compensation for damage done to species (plants, animals, fungi) which are included in the Lithuanian Red Data Book or to their habitats (regulation is expected to come into force in spring 1998); 4. non-compliance with the Hunting Regulation; 5. Compensation for damage done to protected trees and bushes that do not depend to the State Forests Fund (will be revised in 1998); 6. compensation for environmental losses due to damage done to landscape; 7. compensation for damage done to the State Nature Monuments. All above mentioned methodologies foresee higher rates for damage done to the nature components in protected areas. In 1997, nature protection fines in the amount of USD 0.37 million were imposed (separate data about actual collected revenue from nature protection fines are not available). The revenue is allocated to the State Nature Protection Fund. The legislation regulating some of the fines mentioned above is planned to be modified.
– According to the general regulations of National Parks, visitation, the use of forest products and water bodies, or the use of any other resources in their territory is restricted and can be charged in agreement with the respective municipalities.
- Poland – Charges are introduced for the entrance to National Parks. These charges are collected and used by the management of the National Parks.
– Fines are set and collected by the National Park staff, Forest Service for State Owned Forests and Municipal Police.
- Slovak Republic – According to the Act on Nature Protection and Landscape (1994), environmental offices or inspectorates may impose a penalty which varies up to USD 14'000 depending on the harmfulness of the violation. Penalties are paid to the State Environmental Fund. The revenue in the past years was as follows: 1994: USD 0.01 mln; 1995: USD 0.04 mln; 1996: USD 0.28 mln; 1997: USD 0.03 mln.
– In 1993, the Ministry of Environment issued a Regulation on the social value of selected parts of the nature. The Regulation includes a list of protected plants and animals. These values may be taken into account in case of any permitting activities and the environmental offices may impose the charges in case of damage to or deterioration of selected plants and animals.
– In addition, according to the Nature Protection Act, environmental offices or owners of protected areas may collect fees for entrance, transit, parking of motor vehicles in designated protected areas. The revenue from the state nature protected areas is paid to the State Environmental Fund.
– There is also a property tax exemption for lands located in protected areas, water protected areas, swamps and peat bogs.
- FR Yugoslavia – A nature protection non-compliance fee is in force. Violation of nature protection regulations can be fined up to approx. USD 2'500.
– For gathering, using and trading species (such as berries, mushrooms, snails, etc., some of them with high export potential) a permit is needed and a charge of 5% of the highest selling price is levied. 1997 revenues from this charge to the Environmental Fund were approx. USD 0.5 mln. Recently, the gray economy infiltrated this business. There is weak enforcement.
– In Montenegro's National Park Bigradska, an entrance fee is levied. The revenue is used for nature conservation measures in the Park.

Note: No information has been provided for Latvia.

A6. Other Economic Instruments in Force at Present

Environmentally Relevant Tax Allowances and Exemptions

- Bulgaria**
- "There are tax allowances for waste treatment transactions".
 - Duty free import for environmental monitoring equipment, waste water treatment equipment, waste gas treatment equipment, solid waste treatment equipment, solar/wind/biomass energy production equipment, and, production facilities for energy saving lamps. The duty exemption amounts to 10-20% of the value of such goods. The total claimed duty exemptions amounted to USD 1.1 mln in 1996.
- Czech Republic**
- Higher duty and excise for cosmetics containing freon.
 - Preferential VAT rate of 5% (standard rate is 22%): A social approach to selecting the goods with the reduced tax rate was taken. Consequently, such items as foods, solid fuels and heat energy have a lower tax rate. With regard to environmental protection the following goods receive preferential VAT: coatings and lacquers (including enamel and fine lacquers) based on synthetic polymers or chemically-modified natural polymers, dispersed or dissolved in an aqueous medium; biogas; polyvinyl alcohol polymer foils; saw dust, residues and waste, also agglomerates in the form of blocks, briquettes, pellets and similar shapes; paper, carton and cardboard and products manufactured from them in the Czech Republic, on the condition that the certificate indicating production from more than 70 % recycled paper is issued by a Branch Certificate Center; water and wind turbines with outputs respectively up to 100 kW and 75 kVA; heat pumps; solar facilities; household appliances for water purification and small waste treatment plants for family houses, and any parts and components for them; fillings for the appliances and plants; machinery and instruments for air filtering and purifying; automobile catalyzers; passenger cars and other primarily passenger motor vehicles with electric motors; economical light sources (fluorescent and discharge tubes and their components); thermostat valves; flow meters; heat consumption meters and hydrometers for households.
 - Exempt from the income tax is: income from the operation of small hydroelectric power plants with an output up to 1 MW, wind powered electricity generating stations, heating pumps, solar powered facilities, biogas-producing plants, facilities producing bio-degradable substances, which are determined in generally binding legislative provisions, and, facilities utilizing geothermal energy. This income tax exemption can be claimed in the first calendar year of operation and in the subsequent five years.
- Estonia**
- VAT: The standard VAT rate is 18%. According to the VAT Act, goods and services sold for "treating dangerous waste" and recoverable package are exempted from VAT. The Government of Estonia gave also a VAT exemption on goods imported to Estonia within the framework of projects financed by loans taken or guaranteed by the Estonian Government, as well as to environmental equipment and technology imported by the Ministry of the Environment.
 - Income tax: In accordance with the Act on the Income Tax, enterprises pay a 26 per cent tax on "taxable income", where taxable income is defined in relation to gross income and deductible operating expenses (called entrepreneurship expenses). According to the Income Tax Act, pollution charges are not deductible operating expenses for income tax purposes. One main implication of pollution charges being paid of after-tax profits is that the actual rates of pollution charges for an enterprise are about 35 per cent higher than the pollution charge rates specified in the governmental regulations.
- Hungary**
- Mineral oils used for producing electricity are exempt from the consumption tax.
 - In the corporation tax, accelerated amortization rates are in force: for steam-, hot water- and thermal pipes the amortization rate is 4%, while the rate is 33% for solar cells, fluidized coal-fired equipment and other boilers, burning agricultural by-products, emission control equipment, electrostatic filters, other scrubbers serving cleaning of gaseous substances, dust separators, adsorptive gas cleaners. No corporate tax has to be paid for services connected to renewable energy carried out by Public Utility Companies.
 - The preferential VAT rate of 12% (normal rate is 25%) applies for the following goods: solar cells; catalytic converters; propane gas and pb gas; wood for heating purposes and wood briquette.
- Lithuania**
- According to the law on profit taxes, legal persons who use profits for investments do not have to pay profit taxes. This applies also for environmental investments.
- FYR Macedonia**
- All environmental investments are free from income tax.
- Poland**
- The import of equipment for environmental protection is free of custom duties and taxes.
 - From 1 January 1998 taxpayers are granted an exemption from taxable income resulting from the use of waste produced in Poland. The current-year exemption from income is based on the ratio of the value of waste products used in the prior year over the total value of raw materials (including waste) used in the prior year. There is allowance on the income tax for the companies which utilise the following waste products: batteries, tyres, accumulators, plastics waste, glass waste, paper, metal waste, hazardous waste classified as municipal waste, vehicles wrecks.
 - Income tax allowances for farmers who invest in, or modernize environmental protection equipment, renewable energy sources, installations to enhance the use of water;
 - Exemptions from real estate tax for water supply and sewage collection installations, land used for water retention reservoirs and hydro-power stations and various categories of forest land;
 - Exemption from real estate sales tax if the sale was governed by the Act on Environmental Protection;
 - Administrative fee exemptions and income tax exemptions for non-profit organisations active in environmental protection;
 - Interest rate subsidy for farmers adapting their farms to ecological farming principles.
 - The Polish VAT regulation provides a 0% VAT rate for a number of products and services related to environmental protection.
- Romania**
- Exempt from import taxes and charges is equipment for wastewater treatment and sewage systems.
 - The standard VAT rate is 18% (since 1993). Some of the products and services which were exempted from VAT in 1994 were: fuel for domestic users, electricity for domestic use, thermal energy for domestic use, sanitation, water supply and sewerage services, public transport.
- Slovak Republic**
- Operations of small hydropower plants, wind electricity generation, solar equipment, heat pumps, biogas generating equipment and geothermal production facilities are excluded from income tax for the first five years of operation.
 - Commercial activities related to the collection, handling and transport of hazardous waste, facilities dealing with recycling and decreasing the volume or risk of hazardous waste, operations of hazardous waste deposits (landfills) and incinerators of hazardous waste are excluded from income tax if these activities generate a profit.
 - The standard VAT rate in Slovakia is 23%. A reduced rate of 6% exists. For encouragement of environmental friendly products, the reduced rate applies for the following category of products: heating oils with less than 1% of sulfur content, biogas, firewood, wooden chips; paper made of at least 70% of recycled paper; measuring equipment for heat and water consumption in households; treatment of wastewater and solid waste disposal services.
 - A regulation of the Ministry of Finance adopted in April 1996, represents the first step to full energy and fuel price liberalization. The prices are established on the basis of economically justified cost and adequate profit. This assessment is carried out by the Energy Inspectorates. Since June 1997 because of this Regulation, electricity prices increased for large consumers by about 5% and for household by 10%. Centralized district heat supply systems and the use of solid fuel are still subsidized. Household natural gas and electricity prices are still regulated.

- FR Yugoslavia
- Corporate and income tax allowances are available for environment related capital expenditures;
 - A turnover tax exemption is available for solar power equipment;
 - Accelerated depreciation in the amount of 25% is available for energy saving equipment;
 - Pollution reduction equipment is exempt from custom duties and turnover tax;
 - Exempt from the turnover tax are: drinking water, biodiesel and all services aimed to decrease water/air/soil/noise pollution as well as energy saving services.
 - In Monte Negro, fertilizers and pesticides are subsidized through exemption from the turnover tax.

Note: Respective information has not been provided for Croatia, Latvia and Slovenia. The information provided in the table is not necessarily covering all environmentally relevant tax allowances and exemptions in force in the countries covered and therefore should be interpreted with caution. This seems to be the case especially for energy related tax allowances and exemptions.

A7. New Economic Instruments Proposed in CEE Countries

New economic instruments planned for introduction in CEECs:

- | | |
|---------------------------|---|
| Bulgaria | <ul style="list-style-type: none"> - Bulgaria plans to introduce waste related product charges according to the provisions in the new Waste Act passed in 1997. - Emission charges on water and air pollution are proposed. - The draft Act on Mineral Resources foresees the introduction of mining charges and natural resource charges with an environmental component. - An annual nature tax is planned. It would have to be paid by hotels, stores, sport facilities etc. located in nature protected areas. |
| Croatia | <ul style="list-style-type: none"> - Tax/duty allowances for environmental technology, for instance for renewable energy technology, import of waste incineration equipment and equipment for interventions in case of sudden Adriatic Sea pollution; - Environmental Fund at National level; - Other economic instruments are considered for creating a revenue basis for the new National Environmental Fund and to help resolving specific environmental problems (for instance, charges on industrial and hazardous waste). |
| Czech Republic
Hungary | <ul style="list-style-type: none"> - A number of new instruments are proposed: deposit refunds on packaging material, batteries and accumulators; charges on fertilizers and pesticides. - Air emission charge (official designation: environmental load charges): the basis of the planned charge is the quantity of air pollutants emitted from stationary industrial sources. The emphasis is on SO₂, NO_x, CO and non-toxic dust while other air pollutants could be charged as well. The charge rates were determined through cost-benefit analysis but these rates were decreased in the consultation process according to enterprises' ability to pay (proposed rates at present: SO₂ - USD 60 or 120/ton; NO_x: USD 120 or 240 / ton; CO and non-toxic dust: USD 60 / ton; most hazardous air pollutants: USD 1500 / ton). The charge rates would be increased gradually until the final rate is reached in the fifth year after introduction. The planned total revenue in the fifth year after introduction is 50-80 mln USD (at exchange rate of HUF 250 / USD). - Water and soil pollution charges (official designation: environmental load charges): The main objectives of the proposed charges are: to implement the polluter pays principle; to give incentive for firms and for sewage companies to decrease effluents; to give incentive for individuals to decrease water consumption; to connect to sewage channels. In case of water charges, the chargeable subjects are those persons and entities who discharge waste water to water basins. The basis is the quantity and toxicity of effluents discharged. Sewage companies will probably increase sewage charges. In case of soil charge, those individuals and entities have to pay who discharge wastewater into the soil or use waste water reservoirs. The basis is the quantity of waste water discharged, and the danger of technology. For some of the main pollutants, the range of proposed water charge rates is as follows (at actual exchange rates): COD - USD 150-220/ton; BOD - USD 250-360/ton; phosphorus - USD 2500-3650/ton; nitrate - USD 300-440/ton. Multipliers reflecting regional, and hazard factors as well as the sensitivity of receiving water are proposed too. The charges would be introduced gradually over 5 years. In the 5th year after introduction, the planned revenue would be ca. USD 60 mln (at current exchange rates). Most of the revenue would go to the Central Environmental Protection Fund and part to the regional water basin protection agencies and the respective municipalities. - New product charges (paper, dyves and solvents) will be proposed. - New legislation on deposit refund systems is under preparation covering not only on packaging materials. The proposals are still in an early stage. |
| Latvia | <ul style="list-style-type: none"> - Environmental tax on energy resources based on CO₂ and/or SO₂ content; - Tax differentiation between leaded and unleaded gasoline; - Road tax allowance for cars equipped with catalytic converters. |
| Lithuania | <ul style="list-style-type: none"> - Product charges on packaging materials to reduce use of packaging, improve collection of used packaging and increase re-use; - A marketable permit system in the water sector in a determined region of Lithuania is currently being prepared. Judging from the work done so far, positive results can be expected. |

- FYR Macedonia
- Air pollution charges are planned to be introduced: charges shall be payable by both legal entities and individuals. The revenue from the charges shall be channeled to the Fund for Environment and Nature Protection. Apart from 5 basic air pollutants (Particles, SO₂, NO_x, CO, C_xH_y), the charges shall be imposed on approx. 80 air pollutants grouped into three toxicity classes. The proposed charge rates for the main pollutants are as follows (at current exchange rates): Particles: 9 USD/ton; SO₂: 6 USD/ton; NO_x: 4 USD/ton; CO: 10 USD/ton; C_xH_y: 4 USD/ton.
 - Water effluent charges are planned to be introduced: charges shall be collected from industrial facilities and entities releasing pollutants into the water. It is proposed to charge the following water pollutants (in parenthesis the proposed charge rate is given at actual exchange rates): hard metals (31 USD/kg); BOD and suspended particles (26 USD/kg); chlorides and sulfates (20 USD/kg); other emissions (9 USD/kg). An additional 50% shall be added to the basic charges if a pollution source has exceeded the maximum permissible concentrations (MPC).
 - The current system of waste charges does not allow for a realistic cost coverage of waste disposal, recycling and combustion, and has also not allowed investment activities in this area. New waste charges are proposed. Three groups of waste have been identified as basis of the charges. The charge rates are differentiated in these 3 categories according to the cost of treatment:
 - 1) Municipal waste: the current system of user charges is continued. The new element is that 2% of the revenues from these charges is channeled into the Fund for Environment and Nature Protection.
 - 2) Technological waste disposal charges: USD 7/ton (at current exchange rates) for waste created with wood processing, paper cellulose and cardboard production; USD 11/ton for waste with leather and textile industry; USD 18/ton for waste from oil processing, natural gas refining and coal pyrolytic processing; USD 18/ton for organic chemistry processes waste; USD 18/ton for waste generated with the production of paints and polishes, glass enamel; USD 11/ton for waste from waste mineral and transformer oils; USD 7/ton for hospital waste or created with relevant research in the area of health protection; USD 118/ton (18'000 pieces of 2l bottles) for waste of PET-packaging in the food industry; USD 116/ton (62'500 pieces of 0.33l tins) for waste with tins in the food industry.
 - 3) Hazardous waste: divided into three categories in accordance with the Act on Ratifying the Basel Convention on Transport of Dangerous and Hazardous Substances. USD 27/kg for waste from the three categories in accordance with the Basel Convention, excluding waste covered by the technological and communal waste (categories 1 and 2 above).
- Poland
- An environmental product charge (surcharge) on fuels is proposed: two teams of experts hired by the Polish Ministry of Environment have proposed a solution in which surcharge would be applicable to all mining energy agents and fuels (coals, petrol, oils and gases). The proposed level would amount to a determined percentage of the total sales of fuels. Differentiation of rates of the surcharge have been strongly recommended. These differentiated rates should reflect the proportional content of carbon, sulfur and nitrogen compounds in the given type of fuel. The Polish Ministry of Environment has been considering a number of options for introduction of the surcharge on fuels. One recommendation was on introduction of surcharge with maximum rate of 8% for all gasoline consumers together with the exemption on charges emission of SO₂, NO_x and CO₂.
 - An emission charge on CO₂ is considered;
 - New product charges are proposed: the Polish Ministry of Environment is investigating possibilities to introduce product charges on washing agents, PET packaging, paints and varnish on hydrocarbon solvents, packaging of fertilizers, pesticides and food products, metal cans, Tetra-Pack for soft drinks, fertilizers and pesticides and glass packaging.
 - New deposit refund systems are proposed: at present the Polish Ministry of Environment is working on the concept to introduce deposit refund systems on accumulators and tires. At a later stage, deposit refund systems could be established on car bodies, fluorescent lamps, refrigerators, TV sets and monitors;
 - There is interest in introducing tradable permits: Tradable permits especially enjoy the interest in Poland due to the already existing system of pollution permits for individual users. So far, Poland's experience with tradable permits are limited to the so called "Chorzów experiment" which had been started in March 1991 with participation of the Steelwork "Kocziusko" and Power Station "Chorzów". In addition to this experiment, a Phare funded project was launched with the aim to research on the institutional and legal conditions needed to introduce the tradable permit system into the Polish environmental policy. The project covered for its experimental purposes the territory of Opole Voivodship. The recommendations of the project referred to the coverage of all corporate and individual bodies obliged to have the permit for SO₂ emission. The assumption was made that the system of tradable permits would be functioning along with the currently existing system of fees and fines. Additionally, a new instrument - a fine for emissions higher than allowed by the number of permits would be introduced. The introduction of tradable permits would require new legislation;
 - Work on the concept of ecological insurance is carried out;
 - Further expansion of tax allowances and exemptions are considered for giving incentive to pro-ecological activities undertaken by both companies and individuals.

- Romania
- There are plans to establish an environmental fund at national level;
 - In air protection a number of options for new economic instruments are considered: Sulfur tax: adopting domestic tax on the sulfur content of all fuels (fuel oil, diesel fuel, and coal) would give fuel producers an incentive to lower the sulfur content which is far cheaper than trying to capture SO₂ at the point of combustion. Exports would be exempted and imports would be taxed. The tax could be made high enough to completely eliminate any cost advantage to refineries of producing 0.6 % sulfur content diesel relative to 0.05% sulfur diesel. The revenues from this tax would be used as an air pollution control fund. Emission charges: This instrument would be a direct charge levied on measured and monitored emissions by a group of large emissions sources. The charge levels will be based on levels established in the environmental permit, at modest values initially. The profits would be placed in air pollution control fund and earmarked for stationary source pollution control investments. Emissions trading: emission trading give sources flexibility to find low cost alternatives for pollution control. The opportunities for trading in Romania are restricted to SO_x, NO_x and suspended particulate matter. Before such systems can be recommended, current procedures for estimating the quantity of emissions from point sources would have to be improved and the new Law on Atmosphere should be in force. The potential for allowance or marketable permit trading systems for selected air pollutants in Romania is to be considered in the medium term.
 - In water protection a number of options for new economic instruments are considered: There a number of possible instruments; revenues from new instruments could be placed in a river basin water fund. Effluent trading: Industry and municipal sewage treatment plants as point source do have potential for implementing trading systems for BOD, nitrogen, and phosphate discharges. Through trading, the point sources are allowed to satisfy what for it are costly discharge requirements through the purchase of credits that another point source earns for reducing discharges below permitted amounts. The result is that overall pollution goals are satisfied at lower cost. Increased effluent tariffs: Based on toxicity to health and the environment, the tariffs may be increased within permitted quantities and differentiate among various types of suspended and dissolved substances. All the receipts from effluent tariffs will go to the Water Fund with the money earmarked for reducing effluent discharges of point sources. Flood protection fees and dam protection&enhancement fees: Through a surcharge on local property taxes for land and structures located within flood plains, Apele Romane may impose charges for flood protection services. The money collected will be channeled to the Water Fund with earmarking for flood protection activities. Fertilizer and pesticide product charges: product charge on domestic fertilizer and pesticides sales, with proceeds earmarked for non-point source control measures such as education of farmers, monitoring of non-point runoff, and subsidies for not planting or maintaining livestock in a buffer zone near watercourses.
 - In waste management a number of options for new economic instruments are considered: Product charges: A charge can be imposed on packaging material, tires, batteries, newspapers, and other items typically found in post-consumer waste. The amounts collected can be distributed to municipalities so that they can pay for a basic level of waste collection; separate waste streams and recover recyclable items; create additional environmentally sound solid waste landfills; and give subsidies to clean up litters and informal dumps. Penalties: Regulations for waste management must be fair and practical. Penalties must have impact containing clear financial disincentives for non-compliance, a punitive measures for willful violators. Improve user charges: Each user should pay a charge for providing basic solid waste collection services. Deposit-refund for selected waste: The quantities of solid wastes that may be reduced and the recycling can be increased by imposing a mandatory deposit-refund system for materials such as plastic bottles, glass and metal containers, lead-acid batteries and other materials.
- Slovak Republic
- Product charges on packaging material, batteries and accumulators, and tires are proposed in the draft new Waste Act which is supposed to be adopted in 1998.
 - The proposal for the Act on the Protection of Inhabitants against Noise from Aviation Industry and Compensation for Aircraft Affected Neighboring Houses is currently being developed. The revenue from payments introduced under this Act will be a source of revenue of the State Environmental Fund.
- Slovenia
- According to the National Environmental Action Program, charges on fertilizers and pesticides are planned to be levied from 1999 on.
 - A nature protection non-compliance fee is proposed as part of the planned amendment to the Law on Environmental Protection.
- FR Yugoslavia
- Various types of economic instruments are foreseen in environmental policy documents and the framework environmental law. No specific proposals have been made to date.

Table A1: Air Pollution Charges and Fines in Central and Eastern Europe

Country	Type	Goal / function	Subject: who pays	Basis and # of pollutants chargeable	Factors determining charge rates	Level / rate, end 97' (USD/t)	Indexed for inflation?	Revenue leaders	Yearly revenue (mln USD)	Yearly revenue / capita (USD)	Collection efficiency (%)	Revenue distribution	Effectiveness / comments
Bulgaria	NCF	Compl RR	Stationary industrial sources & energy prod.	16 air pollutants	Quan, ExceedS, Time, MinS, Tox, Regio	n.a. (accord. to a formula)	No but to national minimum salary	SO ₂ , NO ₂ , CO, dust, Cu, Pb, phenols	1994: 0.04 1995: 0.34 1996: 0.18 1997: n.a.	94: 0.00 95: 0.04 96: 0.02 97: n.a.	94: 25.4 95: 27.3 96: 30.0 97: n.a.	70% NEF 30% SEF	80% waiver if environm. investments accepted by MoE are done. Enforcement problems esp. with state-owned industry. Inability to pay. Low fine rates.
Czech Republic	EC (a)	RR Incent	medium & large indust. sources & energy prod	ca. 90 air pollutants	Quan, Tox	SO ₂ : 29 Part.: 88 NO _x : 24 CO: 18	No	SO ₂	1994 ¹ : 46.6 1995 ¹ : 45.6 1996 ¹ : 48.0 1997 ¹ : n.a.	94 ¹ : 4.5 95 ¹ : 4.4 96 ¹ : 4.7 97 ¹ : n.a.	94: n.a. 95: n.a. 96: n.a. 97: n.a.	100% NEF (earmark. for air poll. programs)	Introduction of higher charge rates planned. Plans to reduce # of chargeable pollutants. Plans to decentralize certain charges.
	EC (b) NCF	Incent Compl	small busin. heat. syst. like EC (a)	heating syst. performance like EC (a)	Fuel type, Tox like EC (a)	1.5 x EC	No		n.a.	n.a.	n.a.	100% SB like EC (a)	
Estonia	EC	Incent RR	Stationary industrial sources	6 standard pollutants + 134 other pollutants	Quan, Tox, ExceedS, Regio	SO ₂ : 2.3 NO _x : 5.3 CO: 0.3	No, but revised each year.	Dust, SO ₂ , NO _x	1994 ² : 0.5 1995 ² : 0.6 1996 ² : 0.8 1997 ² : 0.8	94: 0.3 95: 0.4 96: 0.5 97: 0.5	> 90%	100% NEF (earmark. for air poll. programs)	Low efficiency due to weakness in emission permit system. Evaluation study on the effectiveness of this charge is underway. Revenue has risen in past years due to gradually increased charge rates.
	NCF	Compl	like EC	like EC	like EC	SO ₂ : 116 NO _x : 265 CO: 1.7							
Hungary ⁴	NCF	Compl RR	Stationary and diffuse industrial and building sources	ca. 200 air pollutants (self reporting) or violation of law.	Quan, ExceedS, Time, Tox, Regio, Height	n.a. (complicated formula)	No	SO ₂ , NO _x , CO, Dust	1994: 6.4 1995: 3.6 1996: 5.7 1997 ³ : 3.2	94: 0.6 95: 0.4 96: 0.6 97 ³ : 0.3	n.a.	70% NEF 30% SB	Part of the fine can be waived if environm. investments accepted by MoE are done. For violating reporting duties the fines can be doubled. New air EC proposed.
Latvia	EC	Incent RR	All legal and natural persons discharging chargeable air pollution	4 classes with > 160 air pollutants (self report.) like EC	Quan, Tox	Dust: 5 CO: 8 SO ₂ : 17 NO _x : 17	No	n.a.	n.a.	n.a.	n.a.	40% NEF 60% SEF	There is a charge waiver available to subsidize the financing of air pollution related investment projects which are accepted by the MoE.
	NCF	Compl			3 x EC for emissions above the limit; 12 x EC for illegal or no reporting				n.a.	n.a.	n.a.	100% NEF	
Lithuania	EC	Incent RR	Stationary and mobile industrial sources like EC	more than 100 pollutants	Quan, Tox	SO ₂ : 52 NO _x : 97 CO: 2.3	Quarterly indexation.	n.a.	n.a. ⁶	n.a. ⁶	n.a.	30% NB 70% SEF	The incentive function of the current system is probably low. Proposed new legislation foresees: decrease of # of chargeable pollutants, revised rates which better reflect environm. policy priorities, simplification especially of the NCF system.
	NCF	Compl, RR		like EC	like EC ⁵ , and: Regio, ExceedS	according to several formulas		n.a.	n.a. ⁶	n.a. ⁶	50-60% (est.) ⁷	100% NEF	
Poland	EC	Incent RR	All legal entities with commercial and non-commercial activities	62 air pollutants	Quan, Tox	SO ₂ : 94 ⁹ NO _x : 94 ⁹	Yes.	SO ₂ ?, NO _x ?	1994 ⁸ : 142.0 1995 ⁸ : 178.6 1996 ⁸ : 175.9 1997: n.a.	94 ⁸ : 3.7 95 ⁸ : 4.6 96 ⁸ : 4.6 97: n.a.	94 ⁸ : 97% 95 ⁸ : 97% 96 ⁸ : 90% 97: n.a.	36% NEF ¹⁰ 64% SEF ¹⁰	A reduction of the pollutants covered by the charge system from the current 62 to around 10 has been suggested. Revenues from air charges are quite high and collection rates exceptionally positive.
	NCF	Compl		like EC	like EC	10 x EC							

Romania	NCF	Compl	Firms for exceeding permitted emission levels	n.a.	not directly linked to actual emissions	Fixed rates. (In 1995: US\$ 250-500 per firm.	n.a.	n.a.	1994: 0.63 1995: n.a. 1996: n.a. 1997: n.a.	94: 0.03 95: n.a. 96: n.a. 97: n.a.	n.a.	100% NB	The Romanian NCF are not true economic instruments as the rates are not dynamic. The NCF rates are too low to give a real incentive to comply with the regulations: In 1994, the average fine was \$ 105 per fined enterprise.
Slovak Republic	EC (a)	RR Incent	medium & large indust. sources & energy prod	> 120 air pollutants	Quan, Tox	SO ₂ : 29 Part.: 86 No.: 23 CO: 17	No	n.a.	1994 ¹¹ : 11.2 1995 ¹¹ : 13.1 1996 ¹¹ : 13.4 1997 ¹¹ : 11.7	94 ¹¹ : 2.1 95 ¹¹ : 2.5 96 ¹¹ : 2.5 97 ¹¹ : 2.2	80%	100% NEF	A surcharge of up to 50 % of the base EC (a) may be levied if a polluter exceeds the permitted emission limit. The surcharge is
	NCF	Compl	who violated air prot. Act	level of violation	level of violation	fixed rates ¹²			1994: 0.25 1995: 0.22 1996: 0.21 1997: 0.06	94: 0.05 95: 0.04 96: 0.04 97: 0.01	80%	100% NEF	not applied in practice though as there is no continuous measurement of actual emissions. Also, environmental
	EC	Incent	small sources (<0.2 MW)	heating system performance (kW)	Fuel type, Tox	flat rate: up to USD285			n.a.	n.a.	n.a.	100% SB	inspectorates do not have sufficient staff to regularly monitor facilities for the EC (a).
Slovenia	ET	Incent RR	who sells fuels or who burns flammable organic material (incinerators) ¹³	Carbon content of hard, liquid or gaseous fuels	Quan, fuel type, CO ₂ content	current tax is ca. 2% of fuels sales price		-	1997 ¹⁴ : n.a.	97: n.a.	97: n.a.	100% NB	Due to the modest price increase for fuels with the CO ₂ tax, only a small reduction in fuel consumption is expected and a modest incentive to use fuels with low carbon content.

Abbreviations: Type: NCF = non-compliance fee; EC = emission charge; ET = eco-tax. Goal/function: Compl = Compliance; RR = revenue raising; Incent = incentive function. Factors determining charge rates: Quan = quantity of emissions; ExceedS = exceedance of standard; Time = time period of emissions; MinS = minimal salary of the country; Tox = toxicity of pollutants; Regio = regional factors; Height = height of emission source from ground. Type= type of pollution source (power plant, industrial plant, mobile source). Revenue distribution: NEF = national environmental fund; SEF = sub-national environmental fund; NB = national budget; SB = sub-national budget.

Notes: Air pollution non-compliance fees are also in force in Croatia and FR Yugoslavia. They are not described in detail here because they have no dynamic rates (i.e., they are penalty instruments with fixed rates). Czech Republic: 1) Total revenue for both Czech air emission charges (i.e., large, medium and small scale sources). It should be noted that the charge rates have been gradually introduced: since 1997, the final rates are in place; in 1996, 80% of the final rates applied; in 1994-5, 60% of the final rates applied. Estonia: 2) The data listed represent total revenue from both, emission charge and non-compliance fee. Hungary: 3) 1997 revenue data for the Hungarian air NCF are estimates. 4) In Hungary, also a NCF on ozone depleting substances is in force. This NCF aims at controlling manufacturing or importing ODS substances in order to implement the Montreal Protocol and the Vienna Convention. Total revenue in 1996 and 1997 from this NCF was around 5'000 - 10'000 USD per annum. Lithuania: 5) If an emission source has emissions of one pollutant above the standard, the NCF in Lithuania has to be paid for all pollutant emissions of a source not just for the one for which the standard is exceeded. Consequently, this system has the potential to create very high marginal penalty rates and therefore provides substantial incentive for a pollution source to comply with standards. 6) Revenue data are only available for all ECs and NCFs in force in Lithuania (i.e., EC and NCF on air poll., EC and NCF on water pollution, NCF on waste disposal): total revenue from pollution charges was USD 4.9 mln in 1994 and USD 17.8 mln in 1997 (i.e., yearly revenue/capita was USD 1.3 in 1994 and USD 4.8 in 1997); total revenue from pollution fines was USD 0.3 mln in 1994 and USD 1.3 mln in 1997 (i.e., yearly revenue/capita was USD 0.1 in 1994 and USD 0.4 in 1997). 7) This percentage is an estimation for the collection efficiency of all pollution charges in force in Lithuania (air and water emission charges and all non-compliance fees). Poland: 8) Data include revenues from the SO₂ and NO_x emission charges (not including revenue from other pollutants and NCFs - needs clarification) only. 9) The data represents the EC level in 1996. 10) 10% of revenue goes to local (gmina) funds and 54% to regional (voivod) funds, except for NO_x charges where 100% of revenue goes to NEF. Slovak Republic: 11) It should be noted that the charge rates have been gradually introduced: in 1999, the final rates are in place; in 97-98, 80% of the final rate applied; in 95-96, 60% of the final rate applied. 12) There are fixed rates for the Slovak NCF varying from USD 140 - 30'000. Slovenia: 13) Exempt from the ET are: wood used for heating; fuels made from biomass; use of biogas which is generated in cleaning equipment or at waste dumps. 14) The Slovenian CO₂ ET was introduced in 1997. Rates will be increased gradually.

Table A2: Tax Differentiation Between Leaded and Unleaded Gasoline in Central and Eastern Europe

Country	Tax differentiation between leaded and unleaded gasoline						Related road transport indicators		
	Basis for tax differentiation	1994	Price difference in % of leaded fuel end-user price (%)	Basis for tax differentiation	end 1997	Price difference in % of leaded fuel end-user price (%)	Market share of unleaded gasoline as of 1996 ⁴ (%)	Cars / capita as of 1996 ⁴ (#/1000 inhabit.)	Average car age as of 1996 ⁴ (years)
		End-use price difference (USD)			End-use price difference (USD)				
		(USD)			(USD)				
Bosnia & H.	n.a.	n.a.	n.a.	n.a.	0.03 \$ ¹	4.2% ¹	n.a.	n.a.	n.a.
Bulgaria	Excise (10%)	? \$?%	Excise (10%)	0.03 \$ ²	4.7% ²	6%	241	15
Croatia	n.a.	n.a.	n.a.	Excise?	0.05 \$	7.5%	30%	169 ⁵	10 ⁵
Czech Rep.	Excise	0.02 \$	3.0%	Excise	0.01 \$	2.1%	55%	326 ⁵	13.9 ⁵
Estonia	no tax diff.	n.a.	n.a.	no tax diff.	n.a.	n.a.	81%	239	n.a.
Hungary	Excise	0.02 \$	3.1 %	Excise	0.03 \$	4.0%	64%	246 ⁵	11.2 ⁵
Latvia	no tax diff.	0.00 \$	0.0%	Excise	0.02 \$	7.7%	n.a.	188	>10
Lithuania	no tax diff.	n.a.	n.a.	no tax diff.	0.00 \$	0.0%	98%	231 ⁵	12 ⁵
FYR Maced.	n.a.	n.a.	n.a.	Excise	0.04 \$	5.2%	n.a.	n.a.	n.a.
Poland	Excise	0.01 \$	2.4%	Excise	0.02 \$ ²	3.5% ²	48%	244	10-11
Romania	unclear	n.a.	n.a.	unclear	n.a. \$ ⁶	n.a. ⁶	5%	123	11.5 ⁵
Slovakia ³	Excise	n.a.	n.a.	Since 1995, there is no leaded gasoline in the Slovak market.			100%	230	14.8 ⁵
Slovenia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	54%	426	6.5
FR Yugosl.	no tax diff.	n.a.	n.a.	no tax diff.	0.01 \$	1.0 %	n.a.	n.a.	n.a.

Notes: "n.a." = data not available; "... " = not applicable. 1) The prices represent maximal retail prices set by the Government. 2) These data refer to average 1996 prices. 3) Since 1995, there is no leaded gasoline in the Slovak market anymore. 4) Source: Danish EPA/COWI (1998): Task Force on the Phaseout of Lead in Gasoline - Final Country Assessment Report. 5) Data refer to 1995. 6) **Data unsafe - needs clarification.** Two sets of data have been provided for end 97 price differences with the following values: 0.01\$ / 3.4% and 0.04\$ / 9.7%. It is unclear which set is correct

Table A3: End-User Water and Sewage Prices for Households in Central and Eastern Europe, 1994 and 1997.

Country	End user prices at the end of 1994 in US Cents / m ³						End user prices at the end of 1997 in US Cents / m ³					
	Prices in capital city			Range of prices in whole country			Prices in capital city			Range of prices in whole country		
	Water	Sewage	Total	Water	Sewage	Total	Water	Sewage	Total	Water	Sewage	Total
Bosnia & Herzegov.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	39	17	56	n.a. ¹	n.a. ¹	n.a. ¹
Bulgaria									14 ²			13 - 34 ²
Croatia												
Czech Republic									68 ³			48 - 99 ³
Estonia	11	15	26	11 - 29	8 - 29	19 - 50	42	44	86	13 - 42	14 - 44	27 - 86
Hungary	23	19	42	26 - 63	13 - 162	39 - 225	33	35	68	21 - 79	15 - 59	36 - 138
Latvia												
Lithuania ⁴	15	10	25	3 - 16	3 - 20	6 - 36	16	19	35	16 - 37	17 - 44	33 - 81
FYR Macedonia						25						24
Poland												
Romania	12	1	13	2 - 51	1	2 - 52	18	4	22	4 - 100	3 - 38	7 - 138
Slovak Republic	12	9	21	12	9	21	18	9	27	18	9	27
Slovenia				11-89	3-41	14-130				10 - 92 ⁵	2 - 40 ⁵	12 - 132 ⁵
FR Yugoslavia										2 ⁴	1 ⁴	3 ⁴

Notes: 1) After the war, water pricing is not re-established in many municipalities 2) It is unclear yet whether the figure refers to water price only or includes sewage charges. 3) Data refer to 1996. 4) Water and sewage prices for municipal companies and industry are higher, in some municipalities prices for industry are up to 100% higher. 5) Average price for whole country. The prices are set by the Government quarterly. Current prices are not cost covering. The prices presented in the table are the prices set on April 30, 1997 and the average prices in the country were: USD 0.36 for water and USD 0.12 for sewage.

Table A4: Water Effluent Charges and Fines in Central and Eastern Europe

Country	Type	Goal / function	Subject: who pays	Basis and # of pollutants charged)	Factors determining charge rates	Level (end 97')	Indexed for inflation?	Revenue leaders	Yearly revenue (mIn USD)	Yearly revenue / capita (USD)	Collection efficiency (%)	Revenue distribution	Effectiveness / comments
Bulgaria	NCF	Compl. RR	Enterprises	27 water pollutants	Quan, Use, ExceedS, Time, MinS, Tox, Regio	complex formula	No but to national minimum salary	BOD?, COD?	1994: 0.71 1995: 0.66 1996: 0.35 1997: n.a.	94: 0.08 95: 0.08 96: 0.04 97: n.a.	94: 48.3 95: 55.0 96: 59.7 97: n.a.	70% NEF 30% SEF	Legislative gaps. Fines too low for giving incentive. 80% waiver available if investments in pollution reduction are done. New water law in preparation.
Croatia	EC	RR Incent	Natural/legal persons discharging wastewater	n.a.	Quan, Use, Tox, Purif, ExceedS	complex formula	n.a.	n.a.	n.a.	n.a.	n.a.	Public water managem. enterprises	Charge waiver available if investments in pollution reduction are done. Reduced rates for wastewater treated prior to discharge.
Czech Republic	EC	Incent. RR	Enterprises	5 water pollutants / quality indicators	Quan, Concentr., Tox	complex formula	No	BOD	1994: 28.9 1995: 24.6 1996: 20.9 1997: 15.9	94: 2.8 95: 2.4 96: 2.0 97: 1.5	94: n.a. 95: n.a. 96: n.a. 97: n.a.	100% NEF (earmark.f. water qual. programs)	
	NCF	Compl.	like EC	like EC	ExceedS	progres-sive			n.a.	n.a.	n.a.	like EC	
Estonia	EC	Incent RR	industrial & water management companies	7 water pollutants	Quan, Tox, Use, Regio	BOD ₇ :95 N: 79 P: 143	No, but revised each year.	BOD ₇ , N, P	1994 ¹ : 0.6 1995 ¹ : 1.2 1996 ¹ : 1.4 1997 ¹ : 1.4	94: 0.4 95: 0.8 96: 0.9 97: 0.9	"rather high"	100% NEF (earmark.f. water qual. programs)	Charges are too low to stimulate constructing new water treatm. facilities. The 50% allowance given to polluters that follow the requirements of permits had positive effects. Weakness is the permit system; it will be improved by applying IPPC Directive.
	NCF	Compl	like EC	like EC	Like EC	BOD ₇ :474 N: 395 P: 713 ²							
Hungary	NCF ¹²	Compl RR	point sources discharging into surface water	32 water pollutants	Quan, Tox, Time, Use, ExceedS, Concentr, Regio	complex formula	No	n.a.	1994: 2.1 1995: 3.5 1996: 2.7 1997: 1.8	94: 0.2 95: 0.3 96: 0.3 97: 0.2	n.a.	70% NEF 30% SB	The charge rates are too low to cover costs to substantially decrease discharges. Even the revenue raising function of the fine is not fulfilled very effectively. Because of financial troubles many charged firms do not pay the fine.
Latvia	EC	Incent RR	Legal/natural persons discharging chargeable water pollution	36 water pollutants (based on self reporting)	Quan, Tox, Concentr	BOD: 50 N: 50 P: 50	No	n.a.	n.a.	n.a.	n.a.	40% NEF 60% SEF	There is a charge waiver available to subsidize the financing of water pollution related investment projects which are accepted by the Ministry of Environment.
	NCF	Compl			3 x EC for emissions above the limit; 12 x EC for illegal or no reporting				n.a.	n.a.	n.a.	100% NEF	
Lithuania	EC	Incent RR	Legal & natural persons discharging pollutants into water bodies	51 water pollutants	Quan, Tox	BOD:109 N: 109 P: 370	Quarterly indexation.	n.a.	n.a. ⁴	n.a. ⁴	n.a.	30% NB 70% SEF	The incentive function of the current system is probably low. Proposed new legislation foresees: decrease of # of charge-able pollutants, revised rates which better reflect environm. Policy priorities, simplification especially of the NCF system.
	NCF	Compl, RR		like EC	like EC ³ , and: ExceedS, Use	according to formulas		n.a.	n.a. ⁴	n.a. ⁴	50-60% (est.) ⁵	100% NEF	
Poland	EC	RR Incent	All entities discharging waste water to water/soil	6 water pollutants	Quan, Tox, Source ⁷	BOD:992 COD:557	Yes.	BOD5?? COD??	1994 ⁶ : 91.3 1995 ⁶ : 104.6 1996 ⁶ : 106.3 1997: n.a.	94 ⁶ : 2.4 95 ⁶ : 2.7 96 ⁶ : 2.8 97: n.a.	94 ⁶ : 45% 95 ⁶ : 36% 96 ⁶ : 57% 97: n.a.	36% NEF 64% SEF ⁸	Proposed changes in the EC: liquidation of the charge differentiation relating to sources/sectors; and, charges

	NCF	Compl	like EC	like EC		BOD: ?? COD: ??								rates interrelated with amount of waste water discharged.
Romania	EC NCF	RR Incent Compl	?Firms? Firms (effl. above permitted levels)	ca. 15 classes of pollutants 20 poll. (only BOD & DSS are enforced)	Quan, Tox? Quan, Tox, ExceedS	BOD: 6 DSS: 1.5 ??	Indexed quarterly like EC?	BOD?, DSS? BOD, DSS	n.a. 1995: n.a. 1996: 1.1 1997: n.a.	n.a. 95: n.a. 96: 0.05 97: n.a.	"very poor" 93: 24% 96: 16% 97: <15%	n.a. 100% NB ⁹	Overall, enterprises have reduced emissions and started using less polluting technology. The fee rates are very low - no real incentive function. Increased rates are proposed.	
Slovakia	EC NCF	Incent RR Compl	each polluter requesting a discharge permit who violated environm. provisions in water law	5 water pollutants / quality indicators level of violation	Quan, Tox, Concentr level of violation	complex formula fixed penalties	No No	BOD	1994: 6.9 1995: 6.9 1996: 7.6 1997: 5.8 1994: 0.4 1995: 0.3 1996: 0.3 1997: 0.3	94: 1.3 95: 1.3 96: 1.4 97: 1.1 94: 0.07 95: 0.06 96: 0.06 97: 0.05	50-60% 94: n.a. 95: 39% 96: n.a. 97: 70%	100% NEF 100% NEF	EC: Surcharges up to 200 % of base rate may be levied to reflect a high level of damage to receiving waters. The wording of the regulation also allows the surcharge to be decreased or forgiven. NCF: payment discipline is weak.	
Slovenia	NCF / EC ¹⁰	Incent Compl	Industry & providers of public services	COD & heavy metals (Hg, Cd, Cr, Ni, Pb,Cu) ¹¹	Quan, Tox, Concentr	COD:150 ¹	Charge rate adjusted periodically	COD?	1995: n.a. 1996: n.a. 1997: n.a.	95: n.a. 96: n.a. 97: n.a.	95: n.a. 96: n.a. 97: n.a.	n.a.	If 50% of the charge value are invested in measures to improve discharges: charge exemption. It is planned to increase the charge rates by a factor 6-7 by year 2000.	
FR YUG: Republic of Montenegro) ¹³	EC	RR Incent	Firms	> 10 water pollutants/ indicators	Quan, Tox	BOD:100 COD: 53 N: 23 P:167	n.a.	n.a.	n.a.	n.a.	91:ca.40%	100% Ministry of Agr., Forests and Water	Polluters with monitoring equipment have to pay. Most of them lack such equipment and they are charged sewage charges instead.	

Abbreviations: Type: NCF = non-compliance fee; EC = emission charge. Goal/function: Compl = Compliance; RR = revenue raising; Incent = incentive function. Factors determining charge rates: Quan = quantity of emissions; Use = type of water use (drinking water, fishery etc.) where effluent goes; ExceedS = exceedance of standard; Purif = level of purification of wastewater before emitting it; Concentr = concentration of pollutants in water; Time = time period of emissions; MinS = minimal salary of the country; Tox = toxicity of pollutants; Regio = regional factors; Source = source of effluent (i.e., charge differentiation by economic sector). Level / revenue leaders: DSS = dissolved suspended substances. Revenue distribution: NEF = national environmental fund; SEF = sub-national environmental fund; NB = national budget; SB = sub-national budget.

Notes: Water pollution non-compliance fees are also in force in Croatia and FR Yugoslavia. They are not described in detail here because they have no dynamic rates (i.e., they are penalty instruments with fixed rates). Estonia: 1) The data listed represent total revenue from both, emission charge and non-compliance fee. 2) For emissions without permit the rates are: BOD7 - 947\$, Nitrogen - 791\$, Phosphorus - 1426\$. Lithuania: 3) If an emission source has emissions of one pollutant above the standard, the NCF in Lithuania has to be paid for all pollutant emissions of a source not just for the one for which the standard is exceeded. Consequently, this system has the potential to create very high marginal penalty rates and therefore provides substantial incentive for a pollution source to comply with standards. 4) Revenue data are only available for all ECs and NCFs in force in Lithuania (i.e., EC and NCF on air poll., EC and NCF on water pollution, NCF on waste disposal): total revenue from pollution charges was USD 4.9 mln in 1994 and USD 17.8 mln in 1997 (i.e., yearly revenue/capita was USD 1.3 in 1994 and USD 4.8 in 1997); total revenue from pollution fines was USD 0.3 mln in 1994 and USD 1.3 mln in 1997 (i.e., yearly revenue/capita was USD 0.1 in 1994 and USD 0.4 in 1997). 5) This percentage is an estimation for the collection efficiency of all pollution charges in force in Lithuania (air and water emission charges and all non-compliance fees). Poland: 6) Data are for EC ??and?? NCF (to be clarified - probably only for EC). The collection efficiency for charges on saline water (from mining) is very low: 12% in 1994; 5% in 1995; 14% in 1996. 7) Charge differentiation according to source or economic sector discharging wastewater is made in case of BOD5 and COD only. Chlorate and sulfate ions in saline water are charged differently when discharged directly to surface water or when discharged to dosing aquifers. 8) 10% of total revenue goes to local (gmina) funds and 54% to regional (voivod) funds, except for charges on saline mining wastewater discharges where the revenue distribution is as follows: 10% gmina funds; 90% NEF (or 50%-50%?). Romania: 9) In case of charged enterprises with a pollution permit, the revenue goes to the Water Fund; if an enterprise without a permit is charged, the revenue goes to the State Budget. Slovenia: 10) The Slovenian wastewater charge is a mixed NCF/EC: for industrial wastewater, the charge has to be paid only when legally fixed minimal concentration standards are exceeded - therefore the charge has a non-compliance function. The charge was introduced in 1995. 11) From the year 2000, also organic halogenated compounds will be chargeable, and, from the year 2003 on also phosphorus and nitrogen. The charges are calculated based on the rate of a "pollution unit" which can be illustrated at the following example: for 1997, 1 pollution unit was USD 7.5. For COD, 1 pollution unit is equivalent to the emission of 50 kg O₂, and has to be paid if discharge concentration is higher than 20 mg/l and yearly emissions exceed 250 kg/year. Hungary: 12) In addition to the described NCF on wastewater, there is also a NCF on sewerage which can be levied on non-household point sources which discharge wastewater into the sewage system. This NCF is calculated and imposed by the respective municipality while the revenue goes to the companies operating the sewage treatment plant. Data on total revenue are not available. Often, companies are charged which are in financial troubles and they do not pay. Charge levels are too low to give any real enforcement power. The relation between the wastewater NCF and the sewerage NCF is not coordinated enough.

Table A5: User Charges on Municipal Waste for in Central and Eastern Europe

Country	Charge rates at end 97		Comments / perspectives
	capital city	range in country	
Bosnia & Herzegovina	USD 0.06/m ² realty & month for households (charges for industry are higher)		Municipal waste user charges existed in whole Bosnia and Herzegovina before the war. Today, many municipalities do not charge yet. In Sarajevo, the municipal waste user charges imposed on households are not enforced consequently; enforcement is stricter on the industry / private sectors. Where charges are imposed they are not cost covering. Revenue distribution: 100% municipal budgets or waste service company
Bulgaria	USD 1.6 / year		Total yearly revenue from municipal waste user charges in 1995 was 26.4 mln USD (3.1 USD/capita) and for 1996, 16.2 mln USD (1.9 USD/capita). The revenue goes to municipal budgets and is not often used for waste management. The charges are not cost covering. Revenue distribution: 100% municipal budgets.
Croatia	USD 0.12 + VAT / m ² realty and month		Charges not cost covering. Revenue distribution: 100% concessioned service company.
Estonia	Households: 5.3 USD/t Industry: 3.6 USD/t	Households: 3.0 -7.1 USD/t Industry: 3.0 -7.1 USD/t	Charges not cost covering.
Hungary	USD 44.2 / year and household	USD 10.1-44.2 / year and household	In the past few years there were significant price in-creses. Supposedly, the charges cover operating cost but not total cost of waste treatment. Municipal waste services are provided partly by private firms and partly by firms owned by local governments. If private firms provide the service, charges must cover full costs.
Lithuania	charge for waste collection: 0.45-0.48 USD / inh. & month charge on disposal of municipal & industrial waste: 4.93 in USD/m ³	charge for waste collection: 0.13-0.55 USD/inhabitant &month charge on disposal of municipal and industrial waste: 0.5-4.93 in USD/m ³	The charges are established by the municipalities based on the proposals by the waste collecting companies and cover operation costs and depreciation of waste collection and transportation equipment. Waste collection charges do not cover landfill costs. Municipal waste landfills are the property of the municipalities and are operated by the waste collection companies free of charge. Landfill construction and maintenance are financed by the municipalities, usually from the municipal environmental funds. As waste collection services are provided on request by the customers, numerous single family houses and small commercial companies refuse to make contracts with waste collection companies and dispose their waste in waste collection containers placed in neighboring residential areas. According to the data collected by some municipalities, losses of waste collection companies caused by unpaid charges can reach as high as 30 % of their income. Planned new legislation should improve: - inefficient collection of charges; - compulsory payment for municipal waste collection/disposal as part of municipal taxes; - improved cost coverage. Revenue distribution: 100% concessioned service companies
FYR Macedonia	charge on municipal waste collection: USD 0.04/ m ² realty & month charge on waste disposal: USD 18/ton for municipal waste; USD 14/ton for construction waste; USD 11/ton for industrial waste		
Romania	0.37USD/person and month	0.18-0.25 USD/person and month. (In some municipalities, waste collection and disposal is charged based on volume: the current range of rates in the country is 2.5-3.4 USD/m ³ .	The previous/current solid waste service system has led to high social costs and low service levels. The financial sustainability of solid waste service is threat-ened by the fact that 30 per cent of the beneficiaries do not pay their bills. In small cities and rural areas the waste collection and transport system have completely broken down. Collection systems appear to be functioning better in some large municipalities. The result of improper solid waste service is that huge quantities of solid waste are deposited in illegal dumps.
Slovenia		\$ 0.48 / m ² realty and month (average charge rate for whole country as of May 1997)	Charges are set quarterly by the Government. Charges not cost covering. A new methodology for mun. waste user charges was introduced in 04/1998:the basis of the new pricing system is cost recovery with prices including cost for waste dumping. New charges are based on mass (ton) or volume (m ³) of waste produced.
FR Yugoslavia			Municipal waste user charges (payment for the service of waste collection and disposal) are in force for decades. The charge level per year is determined as a percentage of the square of a dwelling. Therefore, the method of calculating the charge level is not directly related to the volume of waste produced. Level of the charges are determined completely by the municipalities and the collection is done by communal enterprises. The charges do not correspond with the costs of waste disposal and are not stimulating enough to result in change of behavior. However, financial schemes for waste minimization and recycling are planned. The current charges do not cover all treatment costs and municipalities provide subsidies in many cases. Therefore it is expected that the charges will be further increased but likely far less then needed because of social concerns.

Notes: No information has been provided for Czech Republic, Latvia, Poland, Slovakia.

Table A6: Waste Disposal Charges and Fines in Central and Eastern Europe

Country	Type	Goal / function	Subject: who pays	Basis	Factors determining charge rates	Level / rate at end 97' (\$/ton)	Indexed for inflation?	Revenue leaders	Yearly revenue (mIn USD)	Yearly revenue / capita (USD)	Collection efficiency (%)	Revenue distribution	Effectiveness / comments
Bulgaria ¹	NCF	Compl, RR	Enterprises	13 soil pollutants	Area, MinS, Tox, Regio	n.a.	No but to national minimum salary	illegal deposit of fuel oil and solid HH waste	1994: 0.38 1995: 0.22 1996: 0.06 1997: n.a.	94: 0.05 95: 0.03 96: 0.01 97: n.a.	94: 26.2 95: 17.7 96: 10.2 97: n.a.	70% NEF 30% SEF	Legislative gaps. Lack of monitoring equipm. Fines too low for incentive. 80% waiver if fined industry carries out environm. investment accepted by MoE.
Czech Republic	EC	Incent.	Waste producer (incl. HH?)	Communal and hazardous waste	Quan, Tox	a: 0.6 ² b: 5.7 ² c: 8.6 ²	No	n.a.	1994: 14.8 1995: 22.5 1996: 9.7 1997: 17.6	94: 1.4 95: 2.2 96: 0.9 97: 1.7	94: n.a. 95: n.a. 96: n.a. 97: n.a.	Basic rates to SB; Hazardous rate to NEF	
Estonia	EC NCF	Incent RR Compl	Enterprises like EC	Any kind of waste deposited like EC	Quan, Tox, Regio like EC	I ³ : 66.3 II: 6.6 III: 0.7 IV: 0.2 V: 0.1 I: 33'145 II ³ : 663 III: 32.6 IV: 1.2 V: 0.4	No, but revised each year.	Oil shale burning and processing waste	1994: 0.5 1995: 1.3 1996: 1.3 1997: 2.0	94: 0.4 95: 0.8 96: 0.9 97: 1.3	94: n.a. 95: n.a. 96: n.a. 97: n.a.	100% NEF	Revenue increased after strengthening the permit and information systems. Significant increase was realized when charge rate for oil-shale waste was increased (it used to be 10% of the rate of other waste in the same hazard category).
Hungary	NCF ¹³	Compl RR	Owner or transporter of hazardous or industr waste	Illegal management or handling of haz. waste	Quan, Tox, ExceedS	complex formula	No	n.a.	1994: 0.4 1995: 0.3 1996: 0.5 1997: 0.4	94: 0.04 95: 0.03 96: 0.05 97: 0.04	n.a.	70% NEF 30% SB	The NCF is based on how severely respective legislation was broken. New hazardous waste law is complex and strict, which leads to problems to enforce the NCF.
Latvia	EC	Incent RR	legal/natural persons producing waste for disposal	waste type according to 3 toxicity classes	Quan, Tox	see note ¹⁴	No	n.a.	n.a.	n.a.	n.a.	40% NEF 60% SEF	
Lithuania	NCF	Compl RR	legal or natural persons illegally depositing waste	waste type according to 5 toxicity classes	Quan, Tox	I: 18450 II: 9225 III: 2768 IV: 923 V: 185	Quarterly indexation	n.a.	n.a. ⁴	n.a. ⁴	n.a.	100% NEF	This NCF cannot be considered efficient as it is applied on very rare occasions due to inefficient inspection. New methodologies for assessing the NCF are currently under preparation
Poland	EC NCF		Any waste producer as a result of commercial activities. like EC	19 groups of waste types like EC	Quan, Tox, Source like EC	2-24 \$/t depending on type of waste ⁷	Yes like EC	n.a.	1994 ⁵ : 63.5 1995 ⁵ : 70.1 1996 ⁵ : 72.0 1997: n.a.	94 ⁵ : 1.6 95 ⁵ : 1.8 96 ⁵ : 1.9 97: n.a.	94 ⁵ : 78% 95 ⁵ : 60% 96 ⁵ : 69% 97: n.a.	20% NEF 80% SEF ⁶	There are several proposals to improve the current EC. ⁸

Slovak Republic	EC ¹⁰	Incent RR	every waste producer disposing at a landfill	all types of waste incl. municipal & hazardous	Quan, Tox, Landfill ¹²	see footnote ¹²	No	Municipal Waste	1994 ⁹ : 1.7	94 ⁹ : 0.3	ca. 70%	Rate A ¹² : 100% SB	EC: Delayed payments are allowed if a generator undertakes measures to reduce or to decrease the harmfulness (risk) of the waste through changes in technology, recycling or reusing the waste. ¹¹
	NCF	Compl	who violated waste management legislation	level of violation	level of violation	fixed rates?	No		1995 ⁹ : 5.0	95 ⁹ : 0.9		ca. 80%	
									1996 ⁹ : 7.2	96 ⁹ : 1.4			
									1997 ⁹ : 5.2	97 ⁹ : 1.0			
									1994: 0.6	94: 0.1			
									1995: 0.6	95: 0.1			
									1996: 0.5	96: 0.9			
									1997: 0.3	97: 0.1			

Abbreviations: Type: NCF = non-compliance fee; EC = emission charge. Goal/function: Compl = Compliance; RR = revenue raising; Incent = incentive function. Factors determining charge rates: Area = polluted area in m²; Quan = quantity of emissions; ExceedS = exceedance of standard; MinS = minimal salary of the country; Tox = toxicity of pollutants; Regio = regional factors; Source = source of disposed waste (e.g., charge differentiation according to economic sectors producing the waste); landfill = charge differentiation according to type of landfill in which charged waste is disposed. Revenue distribution: NEF = national environmental fund; SEF = sub-national environmental fund; NB = national budget; SB = sub-national budget.

Notes: No information has been provided for Latvia. Bulgaria: 1) The official name of the Bulgarian charge is "fine for soil pollution and soil damages". Czech Republic: 2) a refers to the basic rate on communal waste; b refers to the basic rate on hazardous waste (regular disposal) and c refers to rate on hazardous waste needing special disposal. These rates will be gradually increased in the coming years. Estonia: 3) Class I = extremely hazardous waste, class II = hazardous waste, class III = moderately hazardous waste, class IV = slightly hazardous waste, class V = inert waste. Non compliance fees are 5-500 times higher than the regular charge, depending on class of hazardousness. Lithuania: 4) Revenue data are only available for all ECs and NCFs in force in Lithuania (i.e., EC and NCF on air poll., EC and NCF on water pollution, NCF on waste disposal): total revenue from pollution charges was USD 4.9 mln in 1994 and USD 17.8 mln in 1997 (i.e., yearly revenue/capita was USD 1.3 in 1994 and USD 4.8 in 1997); total revenue from pollution fines was USD 0.3 mln in 1994 and USD 1.3 mln in 1997 (i.e., yearly revenue/capita was USD 0.1 in 1994 and USD 0.4 in 1997). The revenues from the waste NCF are substantially lower than those from the air and water NCF. Poland: 5) Data are for EC ???and??? NCF (needs clarification - probably only EC). 6) 50% of total revenue goes to local (gmina) funds and 30% to regional (voivod) funds. 7) The NCF is imposed as 1/20 of the annual EC per every day of depositing the waste without a valid permit. 8) Proposed changes in the current EC include: - tighten rates levels in relation to actual amounts of waste and the time of its disposal; - disposal under ground should be exempted from the charge; - setting charge rates based on negotiation; - updating the inventory of waste producers obliged to pay the charges; - focusing on compliance with legal provisions; - increase subsidies for main waste producers with problems in waste utilization and disposal. Slovak Republic: 9) The amount represents only the total revenue to the NEF and does not include revenue to municipalities. 10) In Slovakia, also charges and fines on nuclear waste are in force. These charges and fines have to be paid operators of nuclear facilities and the revenue is earmarked for investment in this sector. These charges and fines are not described in more detail here. 11) It is possible to delay the share of rate B (for class 1,2,4 and 5) by 50% until 1998, 30% until August 1999 and 10% until August 2000. For class 3 the share is 70%, 50% and 30 % respectively. 12) Rate A is for landfills which fulfill the technical conditions of landfill operation required by law. Rate B is for waste disposed in landfills which are operated under special conditions. The revenue from rate A and part of rate B goes to the respective municipality and is earmarked for environmental protection; the other part of the revenue from rate B goes to the State Environmental Fund (67-93% of total revenue depending on the type of waste). The charge rates are as follows (all rates in USD/ton): class 1 - earth and organic matter: 0.03 rate A and 0.09 rate B; class 2 - other waste: 0.29 rate A and 2.86 rate B; class 3 - municipal waste: 0.57 rate A and 8.57 rate B; class 4 - special waste such as detergents and waste from WWTPs: 1.14 rate A and 13.71 rate B; class 5 - hazardous waste: 7.14 rate A and 100 rate B. An additional differentiation exists for disposal of waste on sludge fields: the rate is USD 0.29/ton for special waste; 0.43 USD/ton for hazardous waste; and, 0.17 USD/ton for other waste. Hungary: 13) In addition to the described NCF on hazardous and industrial waste, there is a NCF on illegal waste import in force which can be levied on the importer of illegal waste. There are very few enforceable cases (practically no revenue is generated). Latvia: 14) For non-toxic waste the rate is 0.4 USD/m³; for toxic waste the rate is 2.5 USD/m³; for highly toxic waste the rate is 83.3 USD/m³.

Table A7: Waste Related Product Charges in Central and Eastern Europe

Country	Product charged	Goal / function	Subject: who pays	Basis of charge, factors determining charge rates and level of charge as of end 1997	Yearly revenue (mIn USD)	Yearly revenue / capita (USD)	Revenue distribution	Effectiveness / comments
Estonia	Packaging excise	Incentive for recovery of waste	Importer or domestic user	Basis: alcohol package (# and type of pack.). The rate for alcohol and soft drink packages is (all units in US Cents) 4/package or 14/liter (glass and ceramics), 7/pack. or 14/liter (plastic), 5/pack. or 14/liter (metal) and 2/pack. or 7/liter (other package material).	1997: 0.52	97: 0.3		In force since 3/97' for alcohol packaging. Excise on soft drink packaging is planned for 12/98. Tax waiver available if min. 40% is reused (60% from 1999 on). Revenue in 1997 lower than expected because reuse developed rapidly.
Hungary	Gasoline fuel	RR to solve product related problems & Incent to decrease poll.	Producer or importer of gasoline fuels	Basis: leaded and unleaded gasoline, diesel oil. Level: 1 US Cent per litre in 1997; 3% of consumption tax from 1998.	1994: 23.8 1995: 34.5 1996: 43.9 1997: 35.4	94: 2.33 95: 3.38 96: 4.30 97: 3.47	100% NEF	Due to the low charge level, a direct incentive impact should not be expected. Collection efficiency of the fuel charge is the highest among the Hungarian product charges.
	Packaging materials	as above	Producer or importer of packaging materials	Basis and rates (in US Cents/kg): packaging material made of plastic (5.5), aluminum (2.7), other metals (2.2), paper/wood/textile (1.7), glass (1.1), other materials (2.7). A tax holiday is available if a certain % of packaging is treated/reused.	1994: -- 1995: -- 1996: 12.6 1997: 10.7	94: -- 95: -- 96: 1.24 97: 1.05	100% NEF	The product charges are too low to decrease production/consumption of charged products. The main goal of the charges, to raise revenue for financing product related waste management investments, could only partly be realized. Problems here include: lack of information, monopoly problems, and very slow contracting procedure due to the complexity of the issues. Because of low charge rates and small revenues for some products (e.g. aluminum cans, refrigerators), the financing sources are not enough. Revenue collection effectiveness is best in case of refrigerators and worst in case of packaging materials (several thousand small producers pay the charge, therefore control and administration is not effective). A number of modifications are being prepared: the charges have to be harmonized with EU legislation; charges should be better enforced; the possibility of combined deposit-refund systems has to be examined; level of charge should be increased.
	Tires	as above	Producer or importer of tires	Basis and rates: 16 US Cents/kg tires. For the import of used tires above a certain quota, the rate is 65 US Cents/kg.	1994: -- 1995: 1.9 1996: 8.3 1997: 3.8	94: -- 95: 0.19 96: 0.81 97: 0.37	100% NEF	
	Refrigerators and refrigerants	as above	Producer or importer of refriger.	Rates depend on the volume (l) of a refrigerator and the quantity (kg) or type (hard /soft freon or CFC) of refrigerant. 50% reduction for products with eco-labels.	1994: -- 1995: 0.6 1996: 3.2 1997: 2.7	94: -- 95: 0.06 96: 0.31 97: 0.26	100% NEF	
	Batteries	as above	Producer or importer of batteries	The rate is 21 US Cents/kg batteries.	1994: -- 1995: -- 1996: 3.5 1997: 3.8	94: -- 95: -- 96: 0.35 97: 0.37	100% NEF	
	Lubricants	as above	Producer or importer of lubricants	The rate is 31 US Cents/liter lubricant.	n.a. (in force since 1/1/98)		100% NEF	
Latvia	Lubricants, batteries and accus, mercury lamps, tires, packaging (glass, plastic, metal, paper, etc.), mineral oils	Decrease consumption of charged products; increase reuse, recycling or proper disposal.	All legal and natural persons selling or importing chargeable products.	Charges have to be paid on sales price before excise tax and VAT. Some of the current charge rates are as follows: - mineral oils: 0.03 USD/liter - accumulators: 2.5-10 USD/unit - tires: 0.08 USD/kg - glass packaging: 3% of monetary value - plastic/metal pack.: 5% of monet. value - cardboard pack.: 4% of monetary value - mercury luminescent bulb: 1.8 USD/unit	n.a.	n.a.	100% NEF	Some fixed percentage is earmarked for subsidies for collection, reuse, recycling and appropriate disposal of charged products. In this sense, these product charges can be partly seen as a deposit refund system.

Poland	Plastic containers		Producer and importer	Type of plastic package and type of plastic, # of units. Level: 10% of regular excise tax for packaging made of polyethylene and polypropylene. 20% of regular excise tax for packaging made of polycarbon, polystyrenes and PET (e.g., rate for plastic bottles with a capacity < 1.5 litres: 1.4 US Cents per unit (1998).	n.a.	n.a.	100% NB	Exempted from this excise tax are plastic packaging used for pharmaceuticals and medical materials and plastic packaging produced by companies in the status of "state protected producers".
Slovak Republic	Products and substances damaging the ozone layer	Assist in phasing out CFCs	Producers and importers of CFCs	Substances containing CFCs and cooling equipment. Level: 1.1 USD/kg for CFC substances; 1.1-5.7 \$/l or 2.9-28.6 USD/kW (cooling equipment)	n.a. (charge in force since April 98)		100% NEF	

Abbreviations: Goal/function: Compl = compliance; RR = revenue raising; Incent = incentive function. Revenue distribution: NEF = national environmental fund; SEF = sub-national environmental fund; NB = national budget; SB = sub-national budget.

Table A8: Exchange rates used in this report (annual average, or, as indicated)

Country	Currency	1994	1995	1996	1997	mid-Jan 98'
Bosnia & Herzegovina	Bosn. Mark					
Bulgaria	Lev	54.1	67.2	190	1657	1773
Croatia	Kuna	5.99	5.23	5.43	6.10	6.30
Czech Republic	Koruna	28.8	26.6	27.2	31.4	34.9
Estonia	Kroon	13.0	11.5	12.0	13.8	14.3
Hungary	Forint	105.2	125.7	152.6	186.6	203.8
Latvia	Lat	0.560	0.528	0.551	0.6	0.6
Lithuania	Litas	4.0	4.0	4.0	4.0	4.0
FYR Macedonia	Denar	43.3	38.0	40.0	49.5	54.9
Poland	Zloty	2.272	2.425	2.696	3.3	3.5
Romania	Leu	1580	2037	2752	7323	8140
Slovak Republic	Koruna	32.05	29.71	30.65	33.5	35.0
Slovenia	Tolar	128.81	118.52	135.37	159.3	168.1
FR Yugoslavia	New Dinar				5.6	6.0
	DEM/USD					1.78