
Economic tools for CO₂ reduction in Energy sector

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Problems of CO₂ emission reduction in Lithuanian energy sector are discussed. Economic tools for climate change mitigation are presented. Based on the analysis of experience and results achieved in foreign countries, implementation of carbon tax in Lithuania is considered. An evaluation of excise duties applied to oil products in Lithuania was carried out in accordance with EU Tax Harmonisation Proposal.

Proposals for the achievement of UNFCCC targets in the case of earlier Ignalina NPP closure were developed.

Key words: climate change, energy tax, carbon tax, emission trading

1. INTRODUCTION

The rising concentrations of carbon dioxide in the atmosphere, the resulting increase in the greenhouse effect, and the harmful global warming that this increased greenhouse effect is widely expected to cause, are all truly global problems. CO₂ emissions occur in all economic sectors in all countries of the world, but eventually are thoroughly mixed in the global atmospheric system to affect the global concentration of CO₂. The impacts of climate change are usually presented as a total, annual effect of some assumed change in temperature, precipitation, etc., often associated with a doubling of the atmospheric concentration of CO₂.

CO₂ is by far the most important and most studied greenhouse gas. Emissions of this gas account for approximately 80% of the impact when gases in the basket are weighted according to Global Warming Potential (GWP) and are mostly linked to energy use and production of fossil fuels [1].

Only CO₂ emissions from burning the commercial carbon-based energy sources (coal, oil or gas), hereafter referred to as “carbon energy” are considered in the paper. Energy use is the most important source of total GHG emissions, representing about 80% of EU emissions. Around one third of the total EU emissions of carbon dioxide originates from electricity and heat production. Energy is used by other sectors such as transport, industry and the domestic sector, and for that reason energy-related emissions need to be attributed to these sectors.

There is currently wide debate over the choice of policy instruments to reduce global carbon dioxide emissions. Economists have long argued that charges or tradeable emission quotas are the best policy

instruments to reduce CO₂ emissions. Market-based instruments can take a variety of forms. A distinction must be made between emission (CO₂ emissions) and product (energy or carbon) charges. Emission charges are charges on the discharge of specified pollutants into the environment. Polluters have to pay a given sum of money per unit of pollutant. Tradeable emission quotas operate in conjunction with direct regulation. Where direct regulation provides “permits” for certain levels of emissions, polluters may buy and sell these permits. The scarcer these permits the higher their price.

Although CO₂ is not a regulated pollutant in most countries, the reduction of GHG gases in general, including those of CO₂, is the focus of several international efforts. Prospective environmental tax reform has an important contribution to make as a cost-effective means reaching environmental objectives, and addressing climate change.

2. CO₂ EMISSIONS IN LITHUANIA AND UNFCCC COMMITMENTS

Lithuania ratified UNFCCC on March 24, 1995. It came in force on Jun 22, 1995. The Kyoto protocol was signed on September 21, 1998. The main requirement laid in this protocol for Lithuania is to reduce emissions of GHG by 8% below the 1990 level by the years 2008–2012.

The UNFCCC national implementation strategy was the first step in evaluating the country's impact on climate change, adaptation to it and foreseeing means and measures for climate change mitigation. It was prepared by using the data and research carried out in Lithuania and the strategy development

methodology proposed by the UNITAR. One of the most significant goals of the UNFCCC national implementation strategy is to lay the basis for the country's policies and measures in reference to climate change. When working out the development plans for Lithuania and strategies for the basic sectors of economy (energy, transport, industry, agriculture and forestry), institutions should integrate climate change issues into them.

As one can see from Fig., emissions of CO₂ in Lithuania started to decrease from 1990 and has decreased by 50% during the period 1990–1996 due to industrial collapse. The emissions of CO₂ per capita is 5.1 t in Lithuania. This level is comparable to that of Hungary but lower than that of Austria, Italy and Slovenia [2]. From 1996 the CO₂ started to increase with the recovering of industry.

As the Ignalina NPP plays a crucial role in Lithuanian energy sectors (36% of energy and fuel balance), the main obligation of the UN FCCC (stabilise CO₂ emissions, maintaining the 1990 level of emissions in 2000 and further reduction) will be easily achieved if the Ignalina NPP will operate. Implementation of the main requirement laid in the Kyoto protocol (1997) of this convention (to reduce emissions of greenhouse gases by 8% below the 1990 level by the years 2008–2012) also depends on the fate of the Ignalina NPP. Two scenarios of the future fate of the Ignalina NPP are to be considered: the first option – Ignalina is closed (unit 1 in 2005, unit 2 in 2010), the second option – to close unit 1 in 2005, unit 2 in 2020 according to the technical design of the plant.

In the case of the first scenario, emissions caused by fossil fuel burning will increase considerably, and achievement of the UN FCCC requirement (in 2010 to decrease CO₂ emissions up to 1990 level) will become problematic. The second scenario will

easily fulfil this requirement. So in the case of the first scenario it is necessary to increase the use of natural gas and renewables, replacing high sulphur oil and orimulsion [3].

3. ECONOMIC TOOLS FOR CO₂ CONTROL

The main policy instruments to reduce global CO₂ emissions are carbon or energy charge, CO₂ emission charge and tradable emission permits. These policy instruments ensure that emission goals are obtained in the cost-effective way (*i. e.*, in the cheapest way possible) if certain assumptions are fulfilled and the international agreement is designed properly.

Economic instruments are means of ecological regulation that can be used to reflect the full costs of production and consumption of polluting goods in the market prices. The environmental charges work indirectly to raise the price of goods and induce a reduction of demand and consequently the amount of pollution. They allow organisations to choose the most effective way of reducing their own costs (organisations can choose to pay the charge or to take the steps necessary to reduce emissions).

There are several ways of designing an international system of charges, not all of them cost-effective. Harmonising taxes across national boundaries, for example, is one type of agreement which could lead to inefficiencies, since each country would have an incentive to free ride. A country would prefer to have as few restrictions as possible on its own CO₂ emissions, given the other countries' emission of CO₂. It is in country's interest to make the internationally harmonized CO₂ charge as inefficient as possible by reducing other charges such as charges on energy. A better design for an international agreement based on charges is a system where an international agency imposes charges on each country

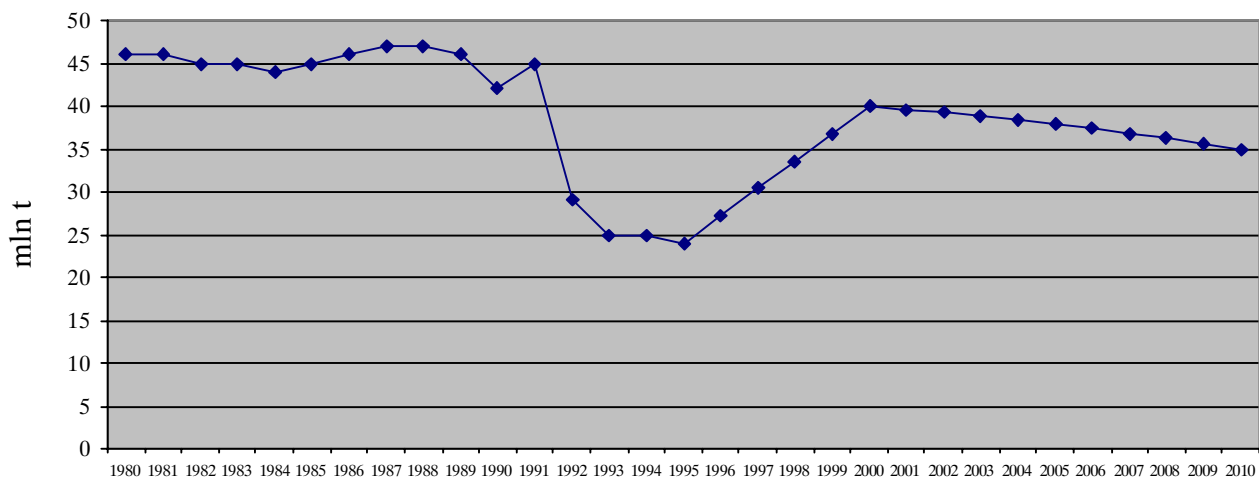


Fig. CO₂ emission dynamics and set emission level targets up to 2010

according to each country's CO₂ emissions. The charge should be the same for all countries, and the charge revenues should be reimbursed to the countries according to a fixed set of reimbursement parameters [4].

A cost-effective international agreement for reducing CO₂ emissions could also be obtained by the use of tradable emission quotas. Each country receives permits according to an agreed allocation rule, and is free to buy or sell quotas or use the whole amount of allocated permits itself [5]. Cost effectiveness requires a competitive market for quotas.

In the following chapters we will overview all market-based policy instruments applied in different countries and will make an attempt to study the possibilities of implementing similar instruments in Lithuania, taking into account the available economic tools of Lithuanian environmental policy.

4. CO₂ CHARGE AND EMISSION CHARGES IN LITHUANIA

Some countries in EU have a CO₂ emission charge. In 1996 Denmark has adopted a charge on CO₂ emissions fully phased in by the year 2000. The size of the charge depends on several factors, but it is of the order of 50 Danish Krone (USD 9) per metric tone of carbon dioxide emitted [6]. Part of the charge is deductible from the company's Value Added Tax (VAT) account, so that the charge may be minimised. The Danes have kept energy prices up since the collapse in oil price in 1986. They also run quite a sophisticated tax regime for energy-intensive industries. Some energy-intensive industries have been exempted, but only where they have made a Negotiated Agreement with a high CO₂ reduction target.

Draft CO₂ charge in Switzerland levied on fuels (phased-in over six years), with revenues distributed to general populace, business and subsidies for energy-intensive industries. There were incentives in Lithuania to introduce CO₂ charge during the review of pollution charge system.

The new improved system of pollution charges was elaborated in Lithuania during 1993–1996, with the aid of experts from the Harvard Institute for International Development and supported by USAID. The Law on Environmental Pollution was adopted on the 13 of April 1999. It was planned to adopt this Law in 1997. During the long period of discussions the tariffs were significantly reduced compared with the initial calculations carried out in the Harvard's study.

The new system is considerably simplified and pollution charges are applied for the significantly reduced quantity of pollutants (from 151 to 18). The individual tariffs would be established only for principal pollutants (in the case of air pollutants for SO₂, NO_x, V₂O₅ and dust) which are easier to control. The tariffs are established in order to achieve the determined pollution reduction aims. The rest of pollutants were grouped according to the level of toxicity into the classes (in the case of air pollutants into four classes) and the same tariff for the class was defined.

Another important feature of the charge system reform is that the tariffs are not a linear function of emissions and norms. Only two tariffs are to apply for each pollutant and pollution source: basic (for emissions lower than the established norms) and penalty tariff (for emissions exceeding the norms). The size of the fine would be defined using the constant multiplier for the basic tariff, but these coefficients would depend on the toxicity of pollutant (Table).

During the initial stage of the new charge system preparation, the charge rate for CO₂ (as the principal pollutant) emissions equal to 0.2 Lt/t was introduced, but later, during the consideration stage of the project, this charge was eliminated from the environmental charge system.

The availability of a wide range of CO₂ estimates all over the world makes the establishment of emission charge rate applied on CO₂ often controversial and debatable. Marginal external costs of CO₂ in the US range between USD 1.2 and USD 25 per tone of carbon dioxide emitted [7]. A. Markanday, famous scientist from Harvard International Development Institute has established that it is not necessary to evaluate damage in separate countries and damage estimates could be evaluated based on the GDP per capita using damage estimates obtained, for example in USA [8]. The coefficients of elasti-

Table 1. Air pollution charges valid from 1 January 2000

Pollutants	Tariffs, Lt/t					Coefficient
	2000	2001	2002	2003	2004	
SO ₂	206	225	268	288	311	1.5
NO _x	386	386	405	479	587	1.5
V ₂ O ₅	11485	11485	11485	11485	11485	300
Dust	184	184	184	184	184	1.5
Classes of pollutants						
I	1210	1210	1210	1210	1210	300
II	570	570	570	570	570	50
III	74	74	74	74	74	30
IV	13	13	13	13	13	1.5

city are being applied in this case. So taking into account the GDP/capita in US and in Lithuania, we can consider the external costs of CO₂ for Lithuania between 0.01 Lt/tonne and 0.2 Lt/tonne.

Reducing the rise in air emissions is the major environmental objective of energy policy in Lithuania. Its success requires different measures, depending on the duration of Ignalina NPP closure. If Ignalina NPP is closed fast, measures to make the thermal power plants to meet environmental standards applied in EU should be taken urgently. The most efficient measures of environmental regulation are economic tools. There are new opportunities in Lithuania for new instruments such as product charges and tradable permits.

5. CARBON OR ENERGY CHARGES

The purpose of the energy or carbon charge is to contribute to the reduction of carbon dioxide emissions and to promote energy savings. Energy or carbon charge is a product charge. Product charges are levied on products that are damaging to the environment either because of the processes and for materials used in the production process, or during the use by the consumer, or when they are disposed of. Product charges can be used when it is difficult to apply emission charges. The product charge (energy or carbon charge) is an indirect tax on pollutants which are present in the product. The advantage of product charges is that they can result in a simultaneous reduction of different types of environmental damage. There are only a few energy taxes available in Europe.

The national energy charge was introduced in the Netherlands in 1996 [9] and is levied on private households and small-scale companies. Four different energy charges apply in the Netherlands: excise duty on mineral oils, an environmental charge on energy products (mineral oils, natural gas and coal) based 50:50 on energy and carbon content of fuel, a small charge to finance oil reserves, and most recently an additional energy charge (Boyle, 1999). Unlike the other charges, the latter charge is only levied on small-scale energy consumers. The energy-intensive industries are exempted as long as they have agreements with government for energy efficiency and greenhouse gas reductions.

The Dutch scheme provides a 40% tax credit for a list of selected energy efficiency and renewable energy measures. Data for the first year of operation in 1997 show that they received 7000 applications for the energy investment tax credit, involving a total investment of about USD 300 mill. Renewable energy received about 15–20% of the investment, while cogeneration, high efficiency boilers, in-

sulation and process heating attracted significant amounts. The revenues from the charge go to the Treasury but are reallocated to the households and companies on whom the tax is levied. The charge is thus limited to small-scale consumption only.

Norway, Finland and Sweden have been among the pioneers of ecological charge reform over the past five years, incorporating carbon, energy and sulphur charges. The Swedish carbon charge raises USD 1,600 mill per annum, with a nominal charge rate of USD 27/tCO₂, and major exemptions for industry. Finland and Norway have set charges which raise the order of USD 580 mill each, with charge rates ranging from USD 10.4/CO₂ (Finland) to USD 212 /tCO₂ in Norway. In the case of Norway, emissions are expected to come down by 2.4% by the year 2000, while Sweden has seen a significant increase in biomass energy investments. Ecological charges in the Nordic countries and the Netherlands now generate between 1.4% and 3% of GDP [9].

Integrating environmentally related economic instruments into the economic decision-making is a new concept in Lithuania. Environmental protection measures have to be backed up with the economic instruments. As business standards are raised, there are new opportunities for new instruments such as product or energy charges.

6. EU TAX HARMONISATION

The proposal for a Council Directive re-structuring the Community framework for the taxation of energy products enlarges the scope of the Community minimum rate system beyond mineral oils to cover all energy products. This proposal would also have direct environmental benefits and would also give Member States the option to differentiate national taxes according to, inter alia, CO₂ emissions. This proposal should be reviewed as a separate but complementary tool to the flexible mechanisms, given it as the first and foremost an internal market mechanism [10].

As a component of the wider EU tax harmonisation proposals currently being discussed, the energy excise duty elements is the least controversial part of the package. The relevant EU Directive, Restructuring the Community Framework for the Taxation of Energy Products – COM (97) 30 Final increased the minimum levels of excise duty on mineral fuels while introducing them to natural gas and coal. Although the EU has no mandate to insist upon it, governments are explicitly encouraged “to avoid any increase in their overall tax burden” and to “endeavour to” reduce taxes on labour.

While the new minimum excise duty levels initially had an impact only on a few of the 15 EU

members (see Table 2), the tax rates will increase in further stages in the years 2000 and 2002. For diesel, the rate increases from 310 ECU per t to 343 ECU and 393 ECU respectively in 2000 and 2002, which would impact all EU members apart from UK. Extension of duty to natural gas and coal is also new for some countries.

At present, only 10 countries tax natural gas and 5 tax coal. For coal, however, the exemptions proposed are extensive; no excise duties for coal used to generate electricity, and none on iron and steel production. That means that only 15% of the total consumption of solid fuels will face the tax.

The EU modeled the possible environmental and economic impacts of new tax levels. They predict a modest increase in GDP, modest increases in employment, modest changes to inflation, and modest but worthwhile reductions in CO₂ – perhaps up to 10% of the EU Kyoto target.

plied in Lithuania are compatible with the EU established minimum levels proposed for 1998, though are a little lower (see Table 2).

Table 3 shows the excise tax and VAT on fuels applied in Lithuania. For motor gasoline the excise tax is 1210 Lt/t (1 USD = 4 Lt) since 1 January 1999 (since 1 January 2000–1370 Lt/t and since 1 January 2001–1150 Lt/ thou. litres). This rate applies uniformly to all grades of gasoline and there is currently no lower rate for unleaded grades. There are lower rates of excise duty for unleaded gasoline than on leaded gasoline in EU countries to encourage greater acceptance of this more environmentally friendly product. This idea was rejected while reviewing the duty rates on the grounds that there was not in place equipment to determine whether gasoline entering the country or leaving the refinery was of a leaded or unleaded grade.

Table 2. Indirect taxes (other than VAT) on certain fuels in Member States, expressed in ECU/tonne at 1 January 1997

Member States	Motor fuel			Heating fuels				
	Leaded petrol	Unleaded petrol	Diesel	Coal	Gasoil	HFO s<1%	HFO s<1%	Natural gas (/1000 m ³)
Proposed minimum levels for 1998	417	417	310	5	21	18	22	7
Belgium	577	518	296		14	6	19	14
Denmark	535	451	311	162	239	282	282	32
Finland	623	545	314	31	55	43	43	13
France	625	583	362		79	18	25	13
Greece	419	366	254		139	43	43	
Ireland	418	375	326		52	19	19	
Italy	580	534	390		390	23	47	14–154
Netherlands	605	538	325	11	93	31	31	40
Portugal	504	496	266		266	13	28	
Spain	401	368	267		78	13	13	6.1
UK	518	458	458		29	24	24	
Sweden (industry)	586	4512	308	28	32	33	33	24
Germany	568	516	328	22	46	20	20	
Austria	489	422	295		77	37	37	50
Lithuania	300	300	130		130			

For comparison, fuel charges applied in Lithuania are also presented in Table 2. As one can see, the rates applied in Lithuania are compatible with those of EU.

7. FUEL CHARGES IN LITHUANIA

Specific charges on petroleum products in Lithuania are Excise Tax, Environmental Tax to be introduced this year, and Petroleum License Fees. As in many countries, the principal taxation of petroleum products in Lithuania takes the form of an excise tax payable at the point at which the product enters the country or at which it leaves refinery. The rates ap-

plied in Lithuania are compatible with the EU established minimum levels proposed for 1998, though are a little lower (see Table 2). Kerosine, jet fuel and automotive diesel fuel: at a rate of 560 Lt/t since 1 January 1999 (since 1 January 2000–720 Lt/t, since 1 January 2001–740 Lt/thou. litres). At present, the 560 Lt/t excise duty rate applies equally to middle distillate used for automotive diesel and for other purposes. In EU countries this is not thought appropriate, and diesel for automotive use is taxed at a higher rate.

Lubricants are taxed at a rate of 240 Lt/t (45 USD/t).

The Lithuanian Government introduced VAT (18%) on all energy prices from January 1, 1997. Later it temporarily exempted residential consumers from paying VAT.

Energy source	Excise tax	VAT(%)	Remarks
Oil	–	18	VAT from 01 01 97
Heavy fuel oil	20	18	VAT from 01 01 97
Gasoline	1210	18	
Kerosene	560	18	
Diesel	560	18	
Jet fuel	560	18	Excise tax not applied for Lithuanian Airlines if jet fuel is produced at Mažeikių Nafta
Lubricants	240	18	
Coal	–	18	VAT from 01 01 97
Liquefied gas	170 (Lt/thous. l)	18	VAT from 01 01 97
Natural gas	–	18	
Wood	–	18	VAT from 01 01 97

As one of the possibilities to improve the system of environmental charges in Lithuania, implementation of product charges on highly polluting fuels such as HFO is worth considering. Product charges would encourage greater utilisation of natural gas instead of HFO, because lower prices of high sulphur mazut compared with natural gas do not create an incentive to use gas. Increased, the price of HFO would help to promote natural gas as an environmentally sound fuel. So the promotion of environmentally more sound fuels – natural gas, low sulphur HFO in the industry and energy sector, oil products in the household and service sector could be ensured by introduction of product charges in the system of Lithuanian environmental charges.

8. FLEXIBLE MECHANISMS FOR CO₂ EMISSION REDUCTION

The Kyoto Protocol allows for the use of three flexible mechanisms: international emission trading, Joint Implementation and Clean Development Mechanism [11].

- International emissions trading allows Parties to the Protocol who reduce emissions below their assigned amount to sell part of their emissions allowance, they can buy the extra from the Parties who have spare capacity and are willing to sell.
- Joint implementation is a specific form of emission trading at project level. Annex I Parties to the Convention can undertake projects (e.g., fuel switching for a power station) with other Annex I Parties which result in additional emission reductions in the country where the project is located. Those reductions can be used to increase the emission allowance of the Party financing the project, while the emission al-

lowance of the Party where the project is carried out would be correspondingly reduced;

- The Clean Development Mechanism is also project-based, but the Parties where the projects are located and the reductions undertaken do not have quantified commitments. For that reason, projects not only need approval by the Parties concerned, but emission reductions resulting from them must also be certified by independent agents.

9. CO₂ EMISSION TRADING

The rules and modalities for use of ET were defined in the Conference of the Parties (COP4) meeting which took place in Buenos Aires on 2–13 November. Emission trading (ET) is based on a simple premise that GHG reduction options may be cheaper in the countries such as those in eastern Europe and the developing world than in others such as US and Norway. Given that climate change is a global problem, and as long as real emission reduction takes place, setting up an ET market should provide a much cheaper option than reductions applied solely at a national level [12].

The starting point for any ET scheme is to provide pollution permits or quotas, set target reductions for the whole market, and then let the trading begin. The main options allocating initial pollution permits are “grandfathering” and “auctioning”.

The grandfathering approach essentially allocates emission permits on the basis of past emissions, less the reduction target level needed to comply with the Kyoto agreement. The big problem with grandfathering is that it favours the status quo and acts as a potential barrier to entry for newcomers. Let's assume that the allocation has been made, either through permits or auctioning. Company A and Company B both have to meet emission reduction targets set by government that call for their current emissions of 100 tonnes of CO₂ to be reduced to 75 tonnes. Company A has a number of very cost-effective options for reducing emissions and is thus prepared to buy emission reduction units from Company B at say USD 20 per tone, which is half what its own estimates are for cutting internal CO₂. The economy thus benefits overall by USD 20 × 25 tonnes = USD 500. Trades offered in the market place would be of interest if they were at a lower cost than internal reduction investments [13].

Under Kyoto Protocol, international emission trading will not become operational before the year 2008. However, the EU Community could set up its own internal trading regime by 2005 as an expression of its determination to promote the achievement of targets in a cost-effective way. This would provide the Community with invaluable practical experience of trading, and its accompanying monitoring regime, in a multicountry context. Such an internal trading regime would not fall under the rules and modalities of international emissions trading under the Kyoto Protocol. Such a Community emission trading regime would rather ensure that the Community would be better prepared at the start of international emissions trading with effect from 2008.

As all the Member States are Parties to the Protocol, the intra-EC trading arrangements will have to be in conformity with the rules and modalities agreed in Buenos Aires for emission trading at an international level. The Council is requested to endorse the introduction of the flexible mechanisms in a step-by-step and co-ordinated way within the Community.

Today Lithuania is able to export carbon dioxide emission quotas or to sell emission permits to other countries, because CO₂ emissions were considerably lower in 1998 than in 1990 (27 and 42 million tonnes, respectively), but up to 2008 these emissions would increase greatly if the Ignalina NPP is to phase out up to 2005 and Lithuania would face a serious problem with the achievement of Kyoto targets (Fig. 1). So Lithuania must prepare for the implementation of economic tools for GHG emission reduction in order to meet obligations of UNFCCC in the case of the Ignalina NPP early closure. Lithuania seeking the EU accession also needs to prepare for the implementation of EU post-Kyoto strategy developed to meet its Protocol commitments.

10. JOINT IMPLEMENTATION PROJECTS

Contrary to emission trading as described above, Joint Implementation (JI) and the Clean Development Mechanism (CDM) are project-based interments that allow for the creation of emission reduction units of certified emission reductions. JI is restricted to projects undertaken between the Annex I Parties (*i. e.* those Parties who have targets set under the Protocol), and CDM concerns projects undertaken in countries of non-Annex I Parties to the Convention. Consequently, the credits earned by Annex B Parties under the Clean Development Mechanism would increase the total allowed emissions of Annex I Parties, although this has to be balanced against the decrease of emissions that a well-desig-

ned and operated CDM will produce in non-Annex I countries [14].

There are some important projects proposed in Lithuania's UNFCCC national implementation strategy for climate change mitigation. These projects are directly interrelated with the commitments of the UNFCCC.

Since 1993, Lithuania has participated in the Swedish Programme for an Environmentally Adapted Energy System in the Baltic Region and Eastern Europe aimed at improving energy efficiency, the use of renewable energy resources, and reducing emissions hazardous to the climate and the environment. The Programme is formulated in line with UNFCCC and its provisions on joint implementation. Lithuania benefited from this programme, having nine projects with total investments worth more than USD 4 million on favourable terms. All projects aim to cut CO₂ emissions by converting heating plants to the use of bio-fuels, reducing heat losses in district heating systems and other measures. All these projects are implemented with the support of Swedish National Energy administration. These projects create the first group in the description of projects.

The second group of GHG mitigation projects is addressed to the renewable energy resources. World Bank and Global Environmental Facility (GEF) initiated the Klaipėda Geothermal Demonstration Project in 1995. The total cost of the project is 25.72 mill USD. The project of the biogas demonstration plant in Rokai was developed using support from Denmark. The wind and solar energy projects are also being implemented.

It is planned to initiate a second phase of projects which aim to cut CO₂ emissions by converting heating plants to the use of local fuels and reducing heat losses in district heating systems in Lithuania. There are 29 points in the tentative list of objects in Lithuania requiring reconstruction of heat supply systems to utilise local fuel where works are to be financed from the Swedish Baltic Sea Fund. The tentative amount of investments is about USD 70 mill.

11. CONCLUSIONS AND RECOMMENDATIONS

Although CO₂ emissions were continuously decreasing since 1991 due to industrial collapse, the situation is likely to worsen when the economy recovers unless measures are taken. Lithuania's obligation of the UN FCCC and Kyoto protocol largely depends on the fate of the Ignalina NPP as the main producer of electricity. In the case of early closure of

Ignalina NPP it will be necessary to use all possible economic tools (such as CO₂ emission tax, energy tax or increased excise duty for fossil fuels) and flexible mechanisms allowed in Kyoto protocol (international emission trading and Joint Implementation) seeking to achieve UNFCCC and Kyoto targets.

The Proposal for a Council Directive introducing a tax on carbon dioxide emissions and energy has been recently amended. The new Proposal creates a framework for applying the tax, the level of which remains to be decided by each participant or host until the end of the century. It provides that, by the end of 1998, the Commission will assess the situation and try again to harmonise rates throughout the EC. Lithuania seeking the EU accession should prepare for the introduction of tax on carbon dioxide emissions and energy tax. Considering CO₂ emission tax as one of the policy options, the rate of 0.2 Lt/t should be applied in Lithuania for CO₂ emissions. Another option is an energy tax. Such tax should be implemented if EU introduces a tax on carbon or energy.

As in many countries, the principal taxation of petroleum products in Lithuania takes the form of an excise tax payable at the point at which the product enters the country or at which it leaves refinery. The rates applied in Lithuania are compatible with EU established minimum levels proposed for 1998 though are a little lower, so the implementation of EU Tax Harmonisation Proposal for Lithuania would not cause big problems.

Today Lithuania is able to export carbon dioxide emission quotas or to sell emission permits to other countries, because CO₂ emissions were considerably lower in 1998 than in 1990 (27 and 42 million tonnes, respectively), but up to 2008 these emissions would increase greatly if the Ignalina NPP Unit 1 is to phase out up to 2005, Unit 2 – in 2010, and Lithuania becomes rather an importer than exporter of CO₂ quotas.

Lithuania participates in JI projects. In the case of earlier closure of the Ignalina NPP there will be a great need in Lithuania to extend the participation in such kind of projects.

Received
20 April 2001

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EKONOMINIAI CO₂ EMISIJŲ MAŽINIMO ENERGETIKOJE INSTRUMENTAI

S a n t r a u k a

Vienintelis realus būdas mažinti CO₂ – deginti mažiau organinio kuro, nes nėra jokių technologinių šių emisijų mažinimo priemonių. Organinio kuro vartojimo mažinimą bei energijos efektyvumo didinimą geriausiai skatina ekonominės priemonės, tokios kaip taršos mokestis už CO₂ emisijas arba energijos mokestis už anglies kiekį, glūdintį kure, bei prekyba taršos leidimais.

Straipsnyje nagrinėjami CO₂ emisijų mažinimo energetikoje klausimai. Pateikta detali ekonominių CO₂ emisijų mažinimo instrumentų analizė. Išanalizuotos anglies mokesčio, energijos mokesčio bei prekybos taršos leidimais įdiegimo galimybės Lietuvoje atsižvelgiant į Vakarų šalių patirtį ir naujausius laimėjimus šioje srityje. Remiantis ES Mokesčių harmonizavimo pasiūlymu, įvertinta Lietuvoje veikianti akcizų naftos produktams sistema. Pateikti pasiūlymai dėl JT Klimato kaitos konvencijos įgyvendinimo priemonių, jeigu bus pasirinktas ankstyvo Ignalinos AE uždarymo variantas.

Raktažodžiai: klimato kaita, anglies mokestis, energijos mokestis, prekyba emisijomis

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ЭКОНОМИЧЕСКИЕ ИНСТРУМЕНТЫ ПО СНИЖЕНИЮ ЭМИССИЙ CO₂ В ЭНЕРГЕТИЧЕСКОМ СЕКТОРЕ

Резюме

Единственным реальным способом снижения выбросов CO₂ является снижение объемов потребляемого топлива, так как не существует других средств для контроля этих выбросов. Самыми приемлемыми средствами снижения количества потребляемого топлива и повышения эффективности энергопотребления являются экономические инструменты, такие как налоги за загрязнение окружающей среды при выбросе CO₂ или налог

на количество угля, состоящего в топливе, а также торговля разрешениями на выбросы.

В статье исследуются вопросы снижения выбросов CO₂ в энергетике. Представлен детальный анализ экономических инструментов по снижению выбросов CO₂. На основе опыта других стран исследованы возможности внедрения этих инструментов в Литве. Руководствуясь анализом Предложения ЕС по гармонизации налогов, дана оценка системы налогообложения акцизами нефтепродуктов в Литве. Предложены меры по снижению выбросов CO₂ в целях удовлетворения требований Конвенции изменения климата.

Ключевые слова: изменение климата, налог на уголь, налог на энергию, торговля выбросами