

Taxation and Environmental Policy

NIKA ŠIMURINA
Faculty of Economics and Business
University of Zagreb
Trg J. F. Kennedy 6, Zagreb
CROATIA
nsokol@efzg.hr; <http://www.efzg.unizg.hr>

MATEA ŠKARO
KPMG Croatia
Ivana Lucica 2a/17, Zagreb
CROATIA
matea.skaro@gmail.com

JURICA ŠIMURINA
Faculty of Economics and Business
University of Zagreb
Trg J. F. Kennedy 6, Zagreb
and
Department of Tourism and Communication Sciences
University of Zadar
Dr. Franje Tuđmana 24 i, Zadar
CROATIA
jsimurina@efzg.hr <http://www.efzg.unizg.hr>

Abstract: - This paper analyses environmental taxation in the EU and targets of the Europe 2020 strategy in respect to environmental goals with special reference to Croatia. We see that environmental taxes and fees have become a significant fiscal tool and a question still remains if they have considerable effect on the environment. However, given the Europe 2020 environmental targets, it seems that the EU will meet its targets before 2020. Even though countries introduce environmental taxation and standards become stricter, in countries like Croatia, which already met the standards with room to spare, it is questionable whether environmental taxation does any service to environment itself.

Key-Words: - environmental policy, environmental protection, pollution, taxation policy, European Union, Croatia

1 Introduction

Environmental protection policy represents a complicated system of public environmental management as a common good. It encompasses policies for stopping further degradation of the environment, public oversight over all pollution sources, rational usage of natural resources and implementation of environmentally friendly technologies in manufacturing, transport and services [1]. The environmental policy aligns many interested parties, business, special interest groups and individuals, with aiming at environmental protection. Within this scope we recognize three

basic tools, command and control, economic (market) and self-regulating instruments [2].

The focus of this paper is on economic instruments and ecological taxes in particular. The problem that we tackle here is whether use of ecological taxes is justifiable. Are there really positive effects of ecological taxes on the environment or are they just another fiscal tool. In order for ecological taxes to work there are conditions to be met. First, sustainable economic development and social system, second, protection of ecosystems and biodiversity, protection and rational use of natural resources, protection from

damaging influence on cultural, aesthetic values and sites, and development of ecological consciousness [3].

In this paper we compare fiscal effects of ecological taxes in the European Union (EU), and analyze the effects of the EU strategic plan focused on sustainable growth.

2 Literature review

Ecological taxes are based on Pigouvian taxes which are levied on activities generating negative externalities thus internalizing negative externalities. OECD established in 1970s the polluter pays principle, meaning that whoever creates environmental damages should bear the cost [4]. However, not until 1980s there is an international interest for ecological taxation. 1980s represent a turning point in thinking where the switch was made from polluter pays to ecological taxes as a market mechanism for environmental regulation. Baumol and Oates [5] extend the meaning of ecological taxes with fees and environmental standards, thus ecological taxes can be expanded to a taxation form having positive environmental impact.

Tullock [6] is among the first to mention double dividend but not under this term, gives insight into how income neutral ecological levies should be replaced with ecological taxes which raise revenues, and there is the double benefit. First benefit is decreased environmental degradation and second is increased tax revenues. Furthermore, it is suggested ecological taxes could replace environmental regulation. Terkla [7] estimates revenue raised from pollution taxation compared to command and control instruments. Tullock [6] suggests that a government could raise “free” revenues, while Terkla [7] estimates the amount of such revenue and efficiency of its use. At the same time Lee and Misiolok [8] see the only benefit in raising revenues.

Double dividend as a term was first introduced by Pearce [9] and defined it as a specific consequence of environmental taxation. First consequence is attributed to discouraging polluters, while second would mean that the “recycled” tax revenue could lower labor taxes and encourage employment. Thus, if the tax burden is shifted in an income neutral way from labor to pollution, two goals could be met at the same time. Goulder [10] distinguishes a weak and a strong form of the double dividend. The weak form means that the “recycled” ecological tax revenue must be a consequence of lowering of a distortionary tax, and not a lump-sum decrease. The strong form of the

double dividend relates to income neutral ecological tax reform where consequences are not costs but welfare increase, meaning that increased environmental quality comes free of charge. Bovenberg [12] disputes the terms weak and strong double dividend.

OECD in its reports from the end of 1980s onward accepts the new ideas in environmental economics and ecological taxation. Furthermore, it is stressed that if well designed and implemented ecological taxes could contribute to the environment and integration of economic policy and environmental protection policy [11].

However, researchers also have serious doubts regarding the theory of the double dividend. Secondary benefits are first to be disputed. Bovenberg and de Mooij [12] present a string of arguments suggesting that the secondary effect of the double dividend is actually negative. If the tax burden is shifted from labor to pollution there is an increase of prices over the decrease in income tax and work and leisure become substitutable, thus the real wage goes down, and more people leave the labor market. Fullerton and Metcalf [13] stress that the net welfare of a society depends on the existing tax rates. Thus, a decrease of income tax with pollution tax has the same outcome, i.e. the same as increased labor taxation and subsidies for “good and clean” products. Both scenarios lower the net wage followed by a decrease in the labor force.

Jaeger [14] concludes that a possibility for the double dividend depends on peculiarities connected to demands of an economy where ecological taxes are an option. Many European countries introduced ecological tax reform and there are examples where double dividend hypothesis can and cannot be found. Also, PETRAS project [15] concludes, based on public perception on ecological tax reform, that there are many problems with such a tax reform, however, not due to negative perception of the public to the concept but for its design. The question should be raised on ethics given the introduction of the ecological taxes. The issue is that when the ecological taxes are introduced it means that one has a permit for pollution. Wallart [16] claims that political correctness of the ecological taxes stems from market inefficiency for solving environmental problems and the fact that environmental policy diversely affects different groups in a society. Great resistance is on the part of those who lose with introduction of new ecological taxes.

3 Ecological taxes

Ecological taxes are introduced so as to influence behavior of businesses and individuals. Result should be better environmental quality. The European Commission, the Eurostat and OECD define ecological taxes from the perspective of a tax base. According to above mentioned institutions, ecological tax is any tax form where the tax base is in physical units of matter for which there is a proof of negative impact on the environment [17].

Also, ecological taxes can be defined as instruments of environmental policy. In this respect we recognize three roles, first, internalization of external costs, second, education, and third, financial. Internationalization of external costs should lead to Pareto efficient allocation of the environment, i.e. the optimal tax rate should be equal to total social marginal cost of pollution prevention [18]. Educational role means that taxes should influence decisions made by potential polluters, where decision is made whether to pay for pollution or not to pollute. The final goal here is to equalize marginal cost of decreasing pollution for all polluters (equimarginal principle). Financial role of ecological taxes is seen through revenues, and such funds can be used for financing environmental protection.

3.1. Ecological taxes in the EU

The EU environmental policy is based on thinking that economic growth, social growth and environmental protection are mutually connected and improve the quality of life. Among the three elements there has to be a balance as to ensure sustainable development in Europe. The greatest challenges for the environment are the climate change, downgraded biological diversity, pollution as a direct threat to human health, use of natural resources and generation of waste. The EU deals with mentioned threats by introducing environmental standards along with promotion of clean technologies.

Current environmental policy in the EU is promoting sustainable development and environmental protection of current and future generations [19]. Most widely used market instruments are ecological taxes and fees. All activities related to ecological taxation in the EU are divided into six ecological programs:

1. First ecological program (1973 – 1976) presented aims of the EU environmental policy, ways to decrease pollution, improve quality of life and improve international cooperation on protection of living environment;

2. Second ecological program (1977 – 1981) continued and widened the scope; focused on preventing water and air pollution, and preservation of forests. Special stress was put on rational natural resources management;

3. Third ecological program (1982 – 1986) gave advantage to the policy of living environment protection, decrease of noise, waste management, and promotion of eco-friendly technologies. Cooperation with developing countries was established aiming at resolving problems in living environment;

4. Fourth ecological program (1987 – 1992) included policy on living environment protection into area of agriculture and transport;

5. Fifth ecological program (1993 – 2000) for the first time defined sustainable development concept;

6. Sixth ecological program (2001 – 2010) implemented under the titled “2010 Our future, our choice” suggested five future strategic priorities: a) improvement of existing laws, b) closer cooperation in markets, c) integration of bodies dealing with the environmental policy, d) aid to people for change in behavior and e) planning for living environment protection [20].

Ecological taxes in the EU today are divided into three groups, energy taxes, transport taxes and pollution and sources taxes (see Table 1).

3.2 Fiscal effect of ecological taxes in the EU

After the Crisis, ecological taxes again were under review over whether they are truly a good way for raising revenues. They improve environmental quality, and at the same time create an opportunity to lower labor taxes [21]. The counter argument is the effectiveness of collection which raises tax burden and thus supports negative criticism.

Table 1: Ecological taxes in the EU

Energy taxes	Transport taxes	Pollution and resources taxes
Mineral oils and petrol	Registration for use of motor vehicles	Pesticides and fertilizers (water protection)
Petrol, leaded and unleaded	Import and sale of motor vehicles	Packaging of metal, plastic, glass and ceramic
diesel	Use of roads and highways and	waste (landfills)
Heating oil	Insurance of luxury yachts	Air pollution (CO ₂ , SO ₂ , NO _x)
Coal oil	noise	Batteries, tires, containers

kerosene	Air traffic passengers	Waste water (household and industrial)
Natural gas		Plastic bags
electricity		Water pollution
		CFC, HFC, PFAC, SF6 (ozone pollution)
		Nuclear energy

Source: The European Commission

Figure 1 shows revenues from ecological taxes in the EU from 2002 to 2013. We can observe that after the fall in 2008 and 2009, due to the Crisis, it rebounds and continues to grow to 331.38 billion Euro in 2013. Energy taxes are dominant in the structure amounting to 75% of total, 20% transport and the rest is pollution and resources tax.

Figure 2 shows total ecological tax revenue as percentage of GDP for EU28. We can observe that the EU28 average is relatively stable after drop in 2008 and revolves around 2.4% of GDP. Underlying data suggests Denmark, the Netherlands and Croatia to have the highest average revenues from ecological taxes, while Spain has the lowest, 2% of GDP. Other member states average between 2 and 3% of GDP.

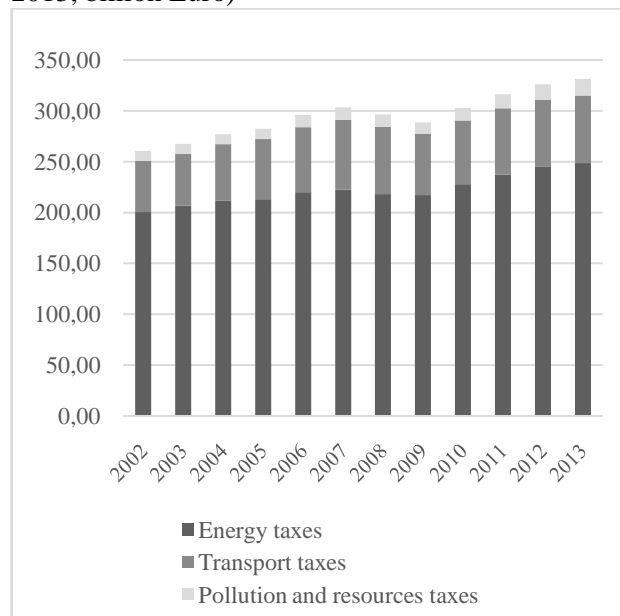
From Table 2 we can see that out of every 16.35 Euro at the EU level, 1 Euro comes from ecological taxes in 2013. The highest average revenue from ecological taxes out of total tax revenues are recorded in Bulgaria, Denmark, Croatia, Malta and the Netherlands.

From Table 2 we see the largest portion of energy taxes in Bulgaria, Czech Republic, Estonia, Lithuania, Luxembourg, Poland and Romania. The largest portion of pollution and resources taxes are recorded in Portugal, Hungary, Croatia and Slovakia. Here it is important to distinguish Hungary as a special case. It is the only country raising more funds from transport tax compared to energy tax, 52% to be precise. Other countries with high portion of transport tax are Belgium, Denmark, Greece, Malta and Austria. In most countries energy tax dominates followed by transport and finally pollution and resources tax. Exceptions to this general conclusion are Estonia, Lithuania, Hungary, Portugal and Slovakia. Also, it should be mentioned that the highest revenue from ecological taxes are recorded in Germany, France, Italy and the UK.

In order to get full insight into effects of ecological taxes country size, development level, tax system development and inequality of tax rates should be accounted for. For example, energy and transport taxes were first used as revenue raising

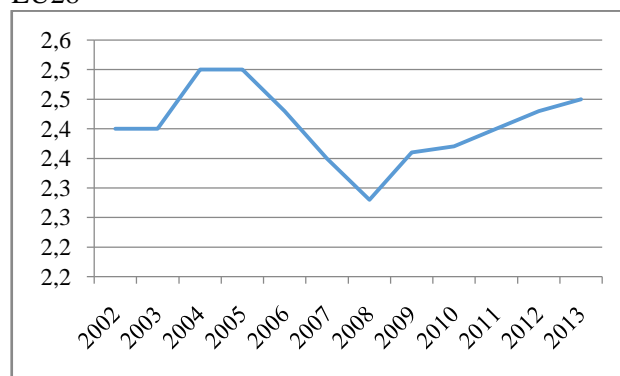
tool, not for environmental protection. Thus, if we look at portion of revenue from ecological taxes only, it is not possible to conclude importance of environmental policy.

Figure 1: Ecological tax revenues in the EU (2002-2013, billion Euro)



Source: Eurostat

Figure 2: Total ecological tax revenue as % GDP for EU28



Source: Eurostat

A portion may be result of high tax rates or wide tax base compared to GDP. In turn this may be a result of inefficient use of resources. Thus, this indicator (portion of ecological taxes in total tax revenues) may be misleading given the goals of environmental protection in respective countries. It is argued that e.g. indirect tax rate on energy can be much better indicator of ecological taxation (or better yet energy taxation) because tax base does not influence the indicator. However, this would not be perfect as well because it treats all sources of energy the same regardless of environmental impact.

Table 2: Revenues from ecological taxes in 2013

	Energy tax	Transport tax	Pollution and resources tax
Belgium	58.50%	35.10%	6.41%
Bulgaria	87.65%	9.65%	2.70%
Czech Republic	92.69%	6.73%	0.59%
Denmark	58.43%	35.45%	6.12%
Germany	81.35%	16.40%	2.26%
Estonia	86.66%	2.28%	11.06%
Ireland	60.07%	38.33%	1.60%
Greece	67.82%	21.57%	10.60%
Spain	76.23%	13.84%	9.93%
France	78.97%	14.03%	7.00%
Croatia	58.64%	22.81%	18.55%
Italy	81.41%	17.77%	0.82%
Cyprus	80.43%	19.57%	0.00%
Latvia	77.93%	18.43%	3.64%
Lithuania	93.95%	2.73%	3.32%
Luxembourg	92.18%	6.93%	0.89%
Hungary	27.10%	52.08%	20.82%
Malta	51.09%	43.60%	5.31%
Netherlands	58.53%	28.48%	12.99%
Austria	65.07%	34.01%	0.92%
Poland	87.61%	8.09%	4.31%
Portugal	48.54%	20.40%	31.05%
Romania	86.16%	13.46%	0.38%
Slovenia	77.00%	11.69%	11.31%
Slovakia	74.28%	10.39%	15.33%
Finland	66.64%	31.25%	2.11%
Sweden	80.31%	18.53%	1.16%
United Kingdom	72.04%	24.50%	3.46%
EU 28	74.99%	20.10%	4.91%

Source: Eurostat

3.3. Harmonization of ecological taxes in Croatia

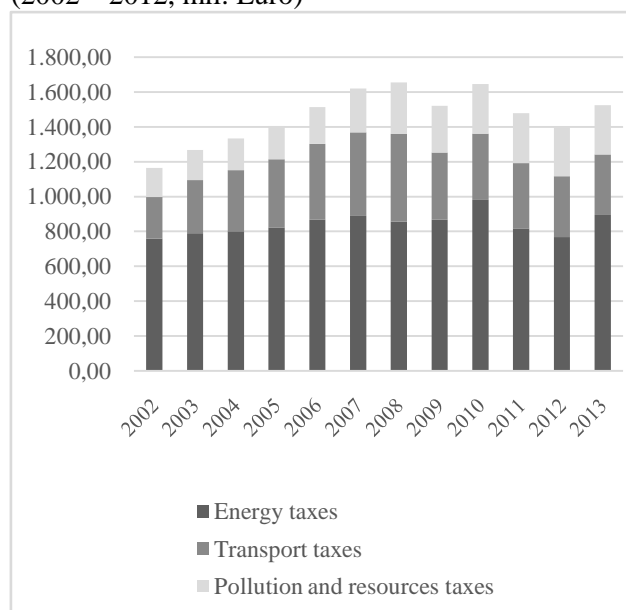
Croatia, as the other East European countries, had to go through restructuring before entering the EU. This was done in pre-integration phase as to achieve the highest possible harmonization of the Croatian economy with the EU economies. The foundation of Croatian environmental protection can be found in the Constitution, laws and bylaws but also through Declaration of Environmental Protection, the National Strategy of Environmental Protection and National Action Plan for Environment [22]. Some of the basic goals of environmental protection in Croatia are protection of life and health, protection of plant and animal life, biological and landscape diversity, protection and upgrading of environment, protection of the Ozone layer, protection of cultural and aesthetic landscape values, prevention of pollution and major accidents involving hazardous materials, rational use of energy, pollution cleanup, sustainable production and consumption.

Environmental protection policy in the beginning did not yield acceptable results. It was regulated by many bylaws and through multiple public bodies using command and control instruments. Economic instruments were introduced step by step, mostly for natural resources management. Best regulated area was water and forests. By accession to the EU Croatia enhanced activities in environmental cleanup, however, lack of economic activity and available funds slowed down implementation of measures and policies. Compared to other Mediterranean countries, Croatia uses more economic instruments in environmental protection. Foremost, these are fees on natural resources and pollution. However, by itself these measures do not cover the overall system that would yield lasting and efficient environmental protection and sustainable development.

The greatest change in Croatian tax system with accession to the EU was introduction of carbon tax on motor vehicles. This is the only true ecological tax in Croatia. Other taxes that could be called ecological, which can be termed *para Pigou* taxes, are taxes on motor vehicles, tax on vessels, excise tax on energy and other fees for use of water, gravel excavation, drain waters, collection of communal waste and landfills, occupancy, use of harbors etc. Figure 3 shows revenues from ecological taxes according to respective categories from 2002 to 2013. We can observe that revenues coincided with the Crises, where growth is observed until 2009, followed by a trend of drop until 2013. This was caused by changes in the tax system due to accession to the EU. Overall change was positive for the observed period. It is interesting to observe

that energy taxes, as a share in total tax revenues from ecological taxes, dropped from 65% in 2002 to 58% in 2013, while portion of transport first increases and after decreases for the observed period. Portion of pollution and resources taxes is continuously on the rise and currently makes 18% of the total, making it top ecological tax revenues in the EU. It is interesting that Croatia, as a small economy with weak overall tendencies has a portion of ecological taxes in total taxes 9.58%, which is a large portion compared to other EU countries.

Figure 3: Total ecological tax revenues in Croatia (2002 – 2012, mil. Euro)



Izvor: Eurostat

4 Justification for ecological taxes

Major criticism of ecological taxes stems from the fact that they do not achieve their primary goal which is decrease of environmental degradation. The question here is: are they popular only for fiscal reasons or do they actually contribute to quality of the environment? Their fiscal role is mentioned above, but now we move onto goals of Europe 2020 strategy.

Given the part on the environmental goals the following targets are set: decrease of GHG by 20% compared to 1990, 20% of energy should come from renewable sources, and 20% increase of energy efficiency. Beside these three targets, respective member states of the EU28 got country specific targets. Given these targets, Croatia is allowed to increase GHG emissions for 11%, should get 20% of its energy from renewable sources, and should not go over 9.2 million tons oil equivalent in primary energy use [23].

Table 3: Europe 2020 environmental targets

	% of renewable energy		Primary energy consumption, Mtoe		GHG emissions, 1990=100	
	EU 28	HR	EU 28	HR	EU 28	HR
1991	-	-	-	-	98,16	78,61
1995	-	-	-	-	93,77	73,42
2000	-	-	-	-	92,06	83,06
2004	8,3	13,2	1.706,0	8,1	93,9	94,71
2005	8,7	12,8	1.709,0	8,2	93,32	95,76
2006	9,2	12,8	1.718,2	8,3	93,31	97,57
2007	10,0	12,1	1.687,3	8,6	92,41	102,19
2008	10,5	12,1	1.686,6	8,4	90,41	98,08
2009	11,9	13,1	1.593,1	8,1	83,82	91,76
2010	12,5	14,3	1.652,4	8,0	85,73	90,27
2011	12,9	15,4	1.593,0	7,9	83,2	89,21
2012	14,3	16,8	1.583,9	7,6	82,13	82,65
2013	15,0	18,0	1.566,5	7,3	-	-
2020	20,0	20,0	1483	9,2	80	111

Source: Eurostat

From Table 3 we can observe progress in reaching Europe 2020 environmental targets. If it keeps up the pace, the EU should reach its targets earlier than 2020. The capacity of Croatia to actually have room for 11% extra GHG reflects the state of industrial production. While most of the EU is still bellow targets, Croatia can actually decrease its energy efficiency. However, both Croatia and the rest of the EU have favorable results and are schedule to meet the targets before 2020.

The data presented here shows Croatia to have above average ecological tax revenues compared to other EU countries. From the data in the table above, there is a question to which extent primary policy targets have to do with environmental taxes. It is questionable to set high rates of ecological taxes and fees when set standards have already been met, i.e. targets of environmental policy have already been achieved.

5 Conclusion

This paper deals with economic instruments in general and ecological taxes in particular. The purpose was to establish justification of introduction of such policy measures, i.e. to see whether there are further benefits beyond fiscal ones.

The targets of Europe 2020 are being met by EU28 member states including Croatia. Compared to other Mediterranean countries Croatia employs

more economic instruments for environmental protection, mostly through use of natural resources and pollution fees. However, the greatest change in environmental tax policy in Croatia came with carbon tax on motor vehicles. This is the only true environmental tax in Croatia today. As with other EU countries, fiscal effect of environmental taxes is positive.

However, criticisms of ecological tax stems from the fact that its primary goal is not met, which is decrease of pollution. The question remains, are they only popular for its fiscal effects? The analysis of environmental policy targets of Europe 2020 strategy shows that it is difficult to say that fiscal revenues do not play a major role. Furthermore, question that remains for further research: are high ecological taxes justifiable in the EU countries where standards have already been met?

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