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COMPARATIVE ANALYSIS OF ENVIRONMENTAL TAXES IN EU AND CROATIA

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Abstract

In order to protect environment, some states use different fiscal and parafiscal instruments that can be financially significant. One of these instruments are environmental taxes, which have a positive influence on the environment. The aim of this paper is to analyse types, importance and financial impact of environmental taxes in EU and Croatia. Analysis of an average revenue share from environmental taxes in GDP had shown that in the period between 2000 and 2013 the biggest average was recorded in Denmark (4.52%) and Netherlands (3.45%), and the lowest in France (1.97%) and Spain (1.82%). In Croatia there are eight different types of environmental taxes and charges. Their total share in revenues in the state budget was 3.45 % of gross domestic product in 2013. In the period between 2008 and 2012 budgets of the Republic of Croatia collected the highest amount of tax revenue from energy tax, while natural resources taxes were negligible.

Key words: *economic instruments, environmental protection, environmental tax, EU, Croatia*

1. INTRODUCTION

Numerous countries use their tax system in order to achieve certain political, economic, cultural, social and other objectives. However, in certain EU countries need of the consolidation of public finances due to long economic and financial crisis has resulted in numerous general tax changes and significant tax efforts that had to be taken and are still being taken. In 2014 only a few EU members did not change tax legislation, most often with the aim to increase tax revenues (by changing tax base, rate and/or allowances) and gross domestic product (GDP). Generally speaking, they tried to change flows of current economic activities (for example, influence on unemployment). Croatia also introduced certain tax changes, thus giving up some of the revenues in order to increase citizens' purchase power and to facilitate business activities to traders and entrepreneurs (for more details see: Government of Republic of Croatia, 2014).

General tax changes, implemented in EU members in period from the mid-2013 to the mid-2014 were made by amending the existing legal rates and/or base of direct and indirect taxes. However, specific tax reforms were conducted by increasing indirect and reducing direct taxes. For example, 18 EU countries decreased income tax base. A great number of countries also reduced income tax base, and 15 among them reduced it by introducing new tax incentives and allowances. In year 2014 Croatia changed her tax system, i.e. the existing tax forms – interestingly, almost as a rule, change included an increase in legal rate and/or base (European Commission, 2014, p. 18)

Particularly interesting are changes of environmental taxes and excise duties. Environmental taxes, including excise duties on energy and electricity, were raised in *15 countries*, while tobacco and alcoholic drink excise duties was raised in *20 Member States* (including Croatia). Should we analyse environmental taxes, but leaving the energy excise out of equation, it can be concluded that 14 Member States raised their tax rate (including Croatia), and it was decreased in only 2 members (Bulgaria and Ireland) (more details in Appendix 1.)

Basic tax changes introduced in EU Member States in 2014 are presented in the Introduction. The second part presents general characteristics and objectives of environmental policy in EU and lists different economic instruments applied. The third and fourth parts of the paper describe the role of environmental taxes and their financial impacts and trends in EU and Croatia. To conclude, general conclusions and results of the analysis of the environmental taxes role in Croatia and EU are presented.

Below is the list of the most significant treaties and action programmes dealing with environmental protection, with a special emphasis on the Seventh Framework Action Programme for Environmental Protection established in 2013. Also, economic instruments of environmental protection are briefly described.

2. THE EU POLICY AND INSTRUMENTS FOR ENVIRONMENTAL PROTECTION

Global and EU environmental policy are very close connected. Changes in other parts of the world are interconnected both directly through impacts of global environmental changes and indirectly through intensified socio-economic pressures which are also noticed in Europe. Europe is putting environmental pressures and accelerating feedbacks in other parts of the world through its dependence on fossil fuels, mining products and other imports. Worldwide and in the EU there are quite a number of multilateral environmental treaties dealing with environmental issues. Some of these treaties are (IBFD, 2009, p. 27):

1. "Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal ("Basel Convention");
2. Convention on Biological Diversity (CBD);
3. Convention on International Trade in Endangered Species (CITES);
4. Convention on Migratory Species (CMS);
5. Ramsar Convention on Wetlands of International Importance ("Ramsar Convention");
6. UN Convention to Combat Desertification (CCD);
7. UN Framework Convention on Climate Change (FCCC);
8. Kyoto Protocol to the UN Framework Convention on Climate Change ("Kyoto Protocol");
9. Vienna Convention to Protect the Ozone Layer ("Vienna Convention"); and
10. Montreal Protocol to the Vienna Convention ("Montreal Protocol").

According to Vogler (2005), two trends in environmental policies will increase implications for the Union's role. These are: "The first trend involves the realization, as demonstrated in the development of the Rio process, that environmental policy cannot stand on its own but is indissolubly connected to trade and development issues. The second trend involves the increasing political salience of certain issues, notably climate change" (p. 849). To create a development of climate change regime, effective bilateral action is required. This includes integration of the environment into EU foreign policy and coherent mobilization of the Union's diplomatic and other capabilities.

Since 1970s EU has adopted a number of action programmes for environmental protection. In November 2013 European Parliament and the Council of EU adopted the so-called Seventh Environmental Action Programme (7th EAP) that applies to the period until 2020 and that is an outcome of "Rio+20" conference. The objectives of this programme are to support implementation and

encourage action at all levels and to promote environment and climate related investment.

The 7th Environmental Action Programme objectives are (European Commission, 2014, p. 22):

1. "To protect, conserve and enhance the Union's natural capital;
2. To turn the Union into a resource-efficient, green and competitive low-carbon economy;
3. To safeguard the Union's citizens from environment-related pressures and risks to health and well-being;
4. To maximise the benefits of Union environment legislation by improving implementation;
5. To improve the knowledge and evidence base for Union environment policy;
6. To secure investment for environment and climate policy and address environmental activities;
7. To improve environmental integration and policy coherence;
8. To enhance the sustainability of the Union's cities,
9. To increase the Union's effectiveness in addressing international environmental and climate related challenges".

By fulfilling the objectives, EU wants to create an inclusive green economy that secures growth and development, safeguards human health and well-being, provides decent jobs, reduces inequalities and invests in environmental protection.

This programme would enable EU to ensure that by 2020 environment and climate policy objectives are achieved in a cost effective manner and adequately supported financially; public and private sector funding for environment and climate-related expenditure is increased and the value of natural capital and ecosystem services, as well as the costs of their degradation, are properly assessed and taken into account in policy-making and investments.

This requires, in particular (European Commission, 2014, p. 69):

1. "Phasing out environmentally harmful subsidies at Union and Member State level without delay, and reporting on progress through the National Reform Programmes; increasing the use of market-based instruments, such as Member States' taxation policies, pricing and charging, and expanding markets for environmental goods and services, with due regard to any adverse social impacts, using an action-based approach, supported and monitored by the Commission, inter alia, via the European Semester;

2. Facilitating the development of and access to innovative financial instruments and funding for eco-innovation;

3. Adequately reflecting environment and climate priorities in policies and funding strategies to support economic, social and territorial cohesion;

4. Making dedicated efforts to ensure the full and efficient use of available Union funding for environmental action, including by significantly improving its early uptake under the Union's Multiannual Financial Framework 2014-2020 and devoting 20% of the budget to climate change mitigation and adaptation through the mainstreaming of climate action and linking that funding to clear benchmarks, target setting, monitoring and reporting;

5. Developing and applying a system for reporting and tracking environment-related expenditure in the Union budget, in particular expenditure on climate change and biodiversity by 2014;

6. Developing and applying alternative indicators that complement and go beyond GDP to monitor the sustainability of progress and continuing work to integrate economic indicators with environmental and social indicators, including by means of natural capital accounting;

7. Further developing and encouraging "payments for ecosystem services" schemes; and

8. Putting in place incentives and methodologies that stimulate companies to measure the environmental costs of their business and profits derived from using environmental services and to disclose environmental information as part of their annual reporting".

Market-based economic instruments are structured to achieve some of three main goals (UNEP, 2004, p.25):

1. "Readressing problems with property rights that contribute to pollution or poor stewardship of resources;

2. Establishing and enforcing prices for resources consumed and environmental damages associated with production; and

3. Subsidizing the transition to preferred behaviours".

The functional objectives of market-based economic instruments are "to establish, clarify or improve property rights, ensure that resource users pay a fair price for what they consume, subsidizing cleaner alternatives and generate revenue" (UNEP, 2004, p. 25). In this concept, a green economy can play a valuable role. A "green economy" can be understood as one in which environmental, economic and social policies and innovations enable society to use resources efficiently enhancing human well-being in an inclusive manner, while maintaining the natural systems that sustain us (European Environment Agency, 2013, p. 5). Besides green economy, the key objectives and targets in EU environmental policy for the period 2010-2050 focus on selected environmental and resource policy areas. These areas are energy, greenhouse gas (GHG) emissions and ozone-depleting substances, air quality and air pollution, transport

sector emissions of greenhouse gases and air pollutants, waste, water, sustainable consumption and production (SCP), chemicals, biodiversity and land use (European Environment Agency, 2013, p. 8). Since EU has set clear policy areas, to achieve ambitious objectives and targets she is using various market based instruments, fiscal instruments and regulatory measures.

The most commonly used economic tools for the environment are taxes, charges and tradable permit systems (Eurostat, 2010, p. 320). Mostly used tax instruments are tax allowance and benefits, special taxes and pollution charges (the so-called environmental taxes), accelerated depreciation of permanent assets for environmental protection, exempts from customs duty payment for the import of environmental equipment, increase of public (state) procurement for environmental products etc. (Šverko, Črnjar and Šverko-Grdić, 2006, p. 495). The advantage of fiscal instruments is their efficiency and the fact that they can raise revenues to reduce distorting taxes elsewhere in the EU economy.

According to Kosonen and Nicodeme (2009) the benefit from environmental taxation is twofold. The first one is "that the governments could earmark part of tax revenues for specific environmental purposes, such as financing eco-efficiency or eco-innovation investments. The second one is that tax revenues could also be used to compensate the households and business, who suffer disproportionately from higher taxation." (p. 5). Environmental taxes can also influence on the behaviour of economic entities and natural persons, aiming to improve and/or prevent negative environmental impacts and provide benefits such as economic incentive to reduce pollution and resource use.

As stated in Abdullah and Morley (2014) "the approach to environmental taxation in the EU has concentrated on the use of taxes to improve the environment, whilst using the revenue raised to reduce the distortionary taxation on labour and production. This policy is often regarded as producing a double effect whereby the environment is improved and at the same time the economy benefits through reduction in these distortionary taxes." (p. 28).

As it has already been stated in the introduction, in 2014 the majority of EU countries decided to raise environmental taxes. Below are short presentations of types and more detailed explanations of financial impacts of environmental taxes in EU and Croatia.

3. ENVIRONMENTAL TAXES IN EUROPEAN UNION

Environmental taxes have three key roles and functions: *internalisation of external costs* (i.e. optimal tax rate should correspond to overall social marginal costs of pollution, the so-called Pareto efficiency of environmental use), *educational* (serve to encourage potential pollutants, i.e. emitters of harmful substances to reach a decision about whether to pay an additional tax unit or to give up emission of additional unit of pollution, an end result being levelled marginal costs of pollution of all emitters), and *financial* (all taxes are usually financially

generous, and collected funds could serve in environment protection). In addition to these functions, environmental taxes also have the function of improving environmental quality. One of the fundamental objectives of the Europe 2020 Strategy is "sustainable growth that includes promotion of green competitive economy that makes efficient use of resources" (European Commission, 2010a). Therefore, European Commission recommends that Member States gradually abandon environmentally harmful subsidies, apply regulations and standards in building, and market-based instruments such as taxes, subventions, and procurement in order to reduce energy and resource consumption, and to encourage energy saving instruments that could raise a level of efficiency in energy-intensive sectors (European Commission, 2010a, p. 19).

According to Eurostat methodology and statistics (adopted by Croatian Bureau of Statistics) "an environmental tax is defined as a tax whose tax base (i.e. the activities as well as the assets subject to the tax) is a physical unit that has a proven, specific, negative impact on the environment " (Eurostat, 2010, p. 320).

Basic subgroups within environmental taxes are as follows (Eurostat, 2010, p. 324):

1. Energy taxes (including the CO₂ taxes). This group includes taxes on energy products for transport (the most important being petrol and diesel) and for stationary use (fuel oils, natural gas, coal and electricity). The CO₂ taxes are included in this group and not among pollution taxes for statistical reasons (it is often not possible to identify CO₂ taxes separately in tax statistics because they are integrated with energy taxes) because they are partly introduced as a substitute for other energy taxes and the revenue from these taxes is often large compared to the revenue from the pollution taxes, which would distort international comparisons.

Energy taxes include, for example, mineral oil and motor oil tax, petrol (lead and non-lead) taxes, diesel, fuel oils, petroleum, kerosene tax, natural gas tax and electricity consumption tax.

2. Transport taxes. This group includes taxes related to the ownership and use of motor vehicles, tax on other transport equipment (e.g. planes) and related transport services (e.g. duty on charter or scheduled flights), but only when they conform to the general definition of environmental taxes. The group also includes "one-off taxes related to imports or sales of the equipment or recurrent taxes such as an annual road tax. This group includes, for example, registration and use of motor oil tax, tax on import and sales of vehicles, road and highway tax, tax on insurance of luxurious yachts and on passengers in the air traffic.

3. Pollution taxes. This group includes taxes on measured or estimated emission to air (except CO₂ taxes) and water, on the management of waste and noise, and

4. Resource taxes covers taxes on extraction of raw materials, with the exception of oil and gas.

According to report from European Environment Agency (2000) most evidence of effectiveness of environmental taxes has been in northern European Member States (in Scandinavia, Finland and the Netherlands). "The evidence indicates that many environmental taxes do have a positive influence on the environment. These are water pollution taxes (e.g. in France, Germany, Netherlands), the Swedish NO_x charge and the tax differentiation on leaded and unleaded petrol are well-know cases. More recent evaluations have shown that the Danish, Finnish and Swedish CO₂ taxes, the UK fuel duty escalator and the Danish tax on sulphur in fuels are producing positive environmental results."(p. 9).

Table 1 shows a total number of different types of environmental taxes, charges and excise duties (for detailed description see Appendix 2) as well as their financial importance in respective EU Member States.

Table 1

Number of environmental taxes and excise duties in EU and their financial impact, as a % of GDP, 2013.

	<i>Number of environmental taxes, charges and excise duties</i>	<i>Financial impact of environmental taxes in EU</i>	
		<i>as a % of GDP (estimate)</i>	<i>as a % of total revenues from taxes and social contributions</i>
Austria	4	2.38	5.57
Belgium	4	2.05	4.28
Bulgaria	2	2.87	10.21
Cyprus	3	2.61	8.24
Croatia	8	3.45	9.50
Czech Republic	4	2.12	6.09
Denmark	21	4.23	8.71
Estonia	2	2.56	8.03
Finland	5	2.92	6.63
France	7	2.03	4.47
Germany	4	2.04	5.31
Greece	3	3.03	-
Hungary	2	2.45	6.37
Ireland	5	2.43	8.47
Italy	10	3.49	8.10
Latvia	6	2.39	8.59
Lithuania	4	1.64	6.07
Luxembourg	2	2.22	5.63
Malta	4	2.69	8.18
Netherlands	7	3.35	9.00
Poland	3	2.36	7.42
Portugal	3	1.84	5.43
Romania	5	1.95	7.14
Slovakia	3	1.72	-

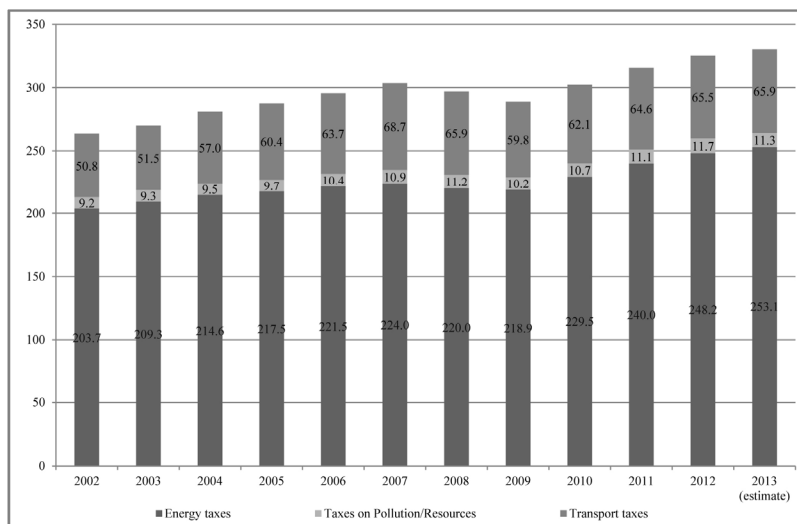
Slovenia	5	3.87	10.46
Spain	3	1.83	5.65
Sweden	9	2.36	5.29
United Kingdom	9	2.51	7.24
EU-28	147	2.44	-

Source: European Commission: *Taxes in Europe Database*; Eurostat: *Environmental Tax Revenues*.

Table 2 shows that in 2013 Denmark (4.23%; it also had the biggest number of different environmental taxes, 21 of them), Slovenia (3.87%), Italy (3.49%) and Croatia (3.45%) had the highest impact of environmental taxes and excise duties measured as % of GDP among EU Member States while Lithuania had the lowest (1.64%). Among EU-28 countries, the financial impact of environmental taxes measured as a percentage of total revenue and social contributions is the most pronounced in Slovenia (10.46%) and Bulgaria (10.21%).

Observation of environmental taxes, charges and excises shows wide dispersion and diversity among Member States. For example, already mentioned Denmark has as many as 21 different types of environmental taxes and charges; consequently, it also has the biggest share of environmental taxes in GDP. Italy has 10, and Croatia 8 different environmental taxes. Figure 1 (and Appendix 4) show the overall revenue from respective types of environmental taxes. It is evident that the highest amounts of revenue are realized from energy taxes.

Figure 1
Total environmental tax revenue by type of tax, EU-28, in EUR 1 000 million, 2002–2013

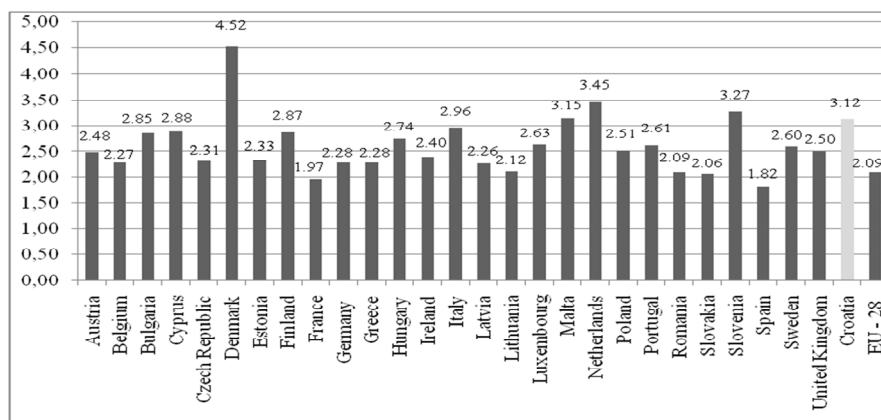


Source: Eurostat: *Environmental Tax Revenues*.

Figure 2 (and Appendices 2 and 3) show the average share of environmental tax revenues in GDP in the period between 2000 and 2013.

Figure 2

Average share of environmental tax revenues in GDP, 2000-2013



Source: Author's calculation based on data from Eurostat: *Environmental Tax Revenues*.

Upon examining Figure 2, it can be observed that Denmark (as much as 4.52%), the Netherlands (3.45%) and Slovenia (3.27%) had the biggest average share of environmental tax revenues in the period between 2000 and 2013, while France (1.97%) and Spain (1.82%) had the lowest. Overall, an average share of environmental revenues in GDP at the EU-28 level in the entire period was 2.09%.

According to Institute for European Environmental Policy (2015) "in the year 2025 the estimated additional revenue generation from the environmental taxes lies between 0.62% GDP (United Kingdom) and 3.68% (Malta). The estimated increases for the other 12 countries (Bulgaria, Cyprus, Denmark, Finland, Germany, Greece, Ireland, Latvia, Netherlands, Slovenia, Spain and Sweden) considered all lie within the range 0.69% GDP to 2.7% GDP." (p. 340).

Having briefly described types of environmental taxes in EU and their financial impact in the previous chapter, the following chapter presents in more details and analyses environmental taxes implemented in Croatia.

4. ENVIRONMENTAL TAXES IN CROATIA

Croatia, *inter alia*, implements the following eight basic types of environmental taxes and charges: special motor vehicle tax, excise duty on electricity, excise duty on natural gas, excise duty on solid fuels, charges for

environment pollutants, charges for the environment users, charges for environmental impact of waste and special environmental charge for motor vehicles. Charges in both EU and Croatia usually include funds collected through funds for environmental and water protection or from public companies offering utility services. In Croatia there are different charges (i.e. parafiscal charges) that are most commonly associated with the use of natural resources and environment protection (e.g. water charge, water protection charge, sand and gravel extraction charge, charges in the system of management of waste vehicles, waste tyres, waste batteries and car batteries, waste oils, packaging and packaging waste). Some of these are briefly described below.

Charges for environment pollutants include charges for the environment emissions and a special annual charge for greenhouse gas emissions. Charges for environment emissions include carbon dioxide charges (CO₂ emission), sulphur oxide as sulphur dioxide (SO₂ emission), and nitrogen oxide as nitrogen dioxide (NO₂ emission). They are calculated and paid according to the quantity of emission in tons, and payers include both legal and natural persons that own or use a single source of CO₂, SO₂ and NO₂ emissions in the framework of their business activities. Special annual charge for greenhouse gas emissions is charged to legal and natural persons that own or use a single source of CO₂, emission in the framework of their business activities. Based on a decision issued pursuant to special regulation governing air protection, CO₂ has been excluded from the emission trading system.

Charges for the environment users include charges for buildings and building units with an obligation of environmental impact assessment. It is calculated and paid according to a building or a building unit and in line with spatial, technical and technological characteristics of a building or a building unit (area, length, capacity etc.) expressed in appropriate units of measurement. It is charged to legal and natural persons that are owners or trustees of buildings or building units.

Charges for environmental waste land include municipal waste charges and/or harmless technological (industrial) waste and hazardous waste charge. Municipal waste charges and/or harmless technological (industrial) waste are charged and paid based on the quantity of waste disposed at landfill. Hazardous waste charge is charged and paid based on the quantity of produced, but unprocessed or unexported waste and based on waste characteristics. These two charges are charged to legal and natural persons disposing waste at landfills.

Special charges for motor vehicles are paid by motor vehicles owners or trustees. They are paid upon vehicle registration, i.e. when checking technical condition of a vehicle. They are determined on the basis of vehicle type, motor and propellant type, working volume or engine power and vehicle age.

Upon accession to EU, Croatia had to amend *Act on special tax on motor vehicles* and to introduce motor vehicle taxation system based on carbon dioxide emissions. The Act (Official Gazette No. 15/13 and 108/13) is in line with

Council Directive 83/182/EEC from 28 March 1983 on tax exemptions within the Community for certain means of transport and Council Directive 83/183/EEC from 28 March 1983 on tax exemptions applicable to permanent imports from a Member State of the personal property of individuals. Pursuant to the above law, special tax is established based on selling, i.e. market price of a motor vehicle, carbon dioxide emissions (CO₂) expressed in grams per kilometre, engine volume in cubic centimetres, and exhaust gases emission. It is paid as a percentage of tax base based on the motor vehicle price (Appendix 6) and a percentage of tax base based on the motor vehicle depending on average carbon dioxide (CO₂) emission expressed on grams per kilometre, depending on the fuel type the vehicle uses (Appendix 6) by adding together obtained calculations. Such *tax is not paid* for motor vehicles using diesel fuel and with an average carbon dioxide emission up to a maximum of 85 grams per kilometre and for motor vehicles using petrol, liquefied propane gas or natural gas and with an average carbon dioxide emission up to a maximum of 90 grams per kilometre. Implementation of this Act in Croatia should raise public awareness on buying greener automobiles, which would greatly contribute to the environmental protection and preservation.

Financial impacts of revenues from environmental taxes in Croatia in the period between 2002 and 2013 are presented in Table 2.

Table 2

Financial impacts of revenues from environmental taxes in Croatia, 2002-2013

	Mil. EUR	as % of GDP	as % of total revenues from taxes and social contributions
2002	1,163.71	4,08	10,89
2003	1,267.08	4,13	11,17
2004	1,334.38	3,99	11,01
2005	1,405.27	3,85	10,66
2006	1,514.12	3,77	10,27
2007	1,611.10	3,67	9,93
2008	1,634.58	3,40	9,27
2009	1,501.62	3,33	9,20
2010	1,634.67	3,63	10,11
2011	1,468.06	3,28	9,37
2012	1,389.73	3,16	8,86
2013	1,504.64	3,45	9,50
Average (2002-2013)	1,452.41	3,65	10,02

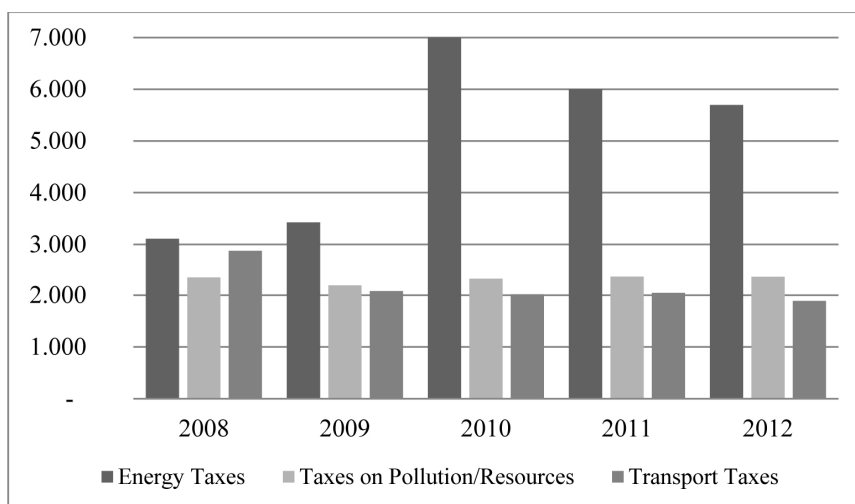
Source: Eurostat: Environmental tax revenues.

It can be observed that during the observed period the share of environmental taxes revenue in Croatia's GDP was the highest in 2003 (4.13%), and the lowest in 2012 (3.16%). The highest share of environmental taxes revenue in 2003 we can explain by implementation of environmental taxes and the lowest environmental taxes revenue could be partially explained as a consequences of recession and constant tax law changes in Croatian fiscal policy.

Figure 3 shows the share of environmental taxes revenue pursuant to the main environmental taxes categories (energy, transport, pollution, natural resources) in Croatia in the period between 2008 and 2012.

Figure 3

Total environmental tax revenue by type of tax in Croatia in billion Kunas, 2008-2012



Source: First Release of Croatian Bureau of Statistics, 2013 and 2014.

During the entire observed period (2008-2012) and taking into account all analysed categories of environmental taxes in Croatia, the biggest share had energy taxes (same as in EU), i.e. budgets received the most revenues from that environmental tax category. The single highest amount in the category was recorded in 2010 (over 7 billion Kunas), while the highest amount in transport tax category was recorded in 2010 (cca. 3 billion Kunas). It is interesting to note that since 2009 pollution taxes have had ever more important role, while the importance of transport tax has weakened. At the same time, financial impact of resources tax in overall environmental revenues is negligible in the entire period.

5. CONCLUSION

Tax reforms in EU Member States that took place from mid-2013 to mid-2014 are a consequence of the process of consolidation of public finances which was most commonly done by increasing indirect and reducing direct taxes. When it comes to revenue tax, 18 EU countries reduced their tax bases, while 15 Member States increased environmental taxes (including excise duties on energy products and electricity). An increase of environmental taxes in EU-28 resulted in an increase of revenues on that base. Precisely those types of taxes are implemented in order to try and influence behaviour of economic subjects and natural persons with the aim to improve and/or prevent negative environmental impacts.

The group of environmental taxes comprises four basic subgroups: energy taxes, transport taxes, pollution taxes and natural resources taxes. The analysis of financial importance of environmental taxes in EU and Croatia has shown that in 2013, among all EU members, Denmark (4.23%), Slovenia (3.87%), Italy (3.49%) and Croatia (3.45%) have had the biggest financial impact from environmental taxes and excise duties measured as GDP share.

Analysis of an average revenue share from environmental taxes in GDP during extended time period had shown that in the period between 2000 and 2013 the biggest average was recorded in Denmark and the Netherlands, and the lowest in Spain and France. With eight different types of environmental taxes and charges (special motor vehicle tax, excise duty on electricity, excise duty on natural gas, excise duty on solid fuels, charges for environment pollutants, charges for the environment users, charges for environmental impacts of waste and special environmental charge for motor vehicles), Croatia reached 3.45% of GDP in 2013, unlike 2003 when high 4.13% of GDP was reached.

The legal EU framework is constantly evolving and Croatia is obliged to harmonize its national legislation to with the EU *acquis*. In November 2013 European Parliament and the Council of EU adopted the 7th Framework Action Programme for environmental protection until 2020. Thus, it should be expected that Croatia, as the newest Member State, will have to implement the programme and additional actions for environmental protection. This means, in particular to give incentive to the public and private research and innovation efforts required for the development of innovative technologies that will reduce cost of transition to low carbon, resource-efficient, safe and sustainable economy and to increase effort to reach existing targets and reviewing approaches to green public procurement. Consequently, Croatia has, among other things, in July 2015 changed the Environmental Protection Act (Official Gazette No. 78/15) in order to improve the system of nature protection through effective monitoring, division of responsibilities and improve the process of environmental impact assessment (eg. some public and private projects). Further adjustments are expected in late 2015 when is expected that the Government of Croatia enact Legislation harmonization plan with the EU for 2016.

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Appendix 1

Tax changes adapted from mid-2013 to mid-2014

		Statutory rates	Base or special regime
Environmental taxes (including excise duties on energy and electricity)	increase	15 countries - BE, CY, BG, EE, ES, FI, FR, HR, IT*, LV, MT, NL, PL, RO, SI	3 countries - BE, EE*, FR
	decrease	-	5 countries - BG, DK, DE, HR, UK
Environmental taxes (excluding excise duties on energy and electricity)	increase	14 countries - AT, BG, ES, FI, FR, HR, HU, IT, LT*, LV, NL, PT, SI, UK	5 countries - BE, CY, FR, NL, UK
	decrease	2 countries - BG, IE	3 countries - DK, MT, UK

Source: European Commission. 2014a. Tax Reforms in EU Member States, 2014. European Economy, 6.

* Tax changes as consequences of the consolidation of public finances.

Note:

AT-Austria, BE-Belgium, BG-Bulgaria, CY-Cyprus, CZ-Czech Republic, DE-Germany, DK-Denmark, EE-Estonia, EL-Greece, ES-Spain, FI-Finland, FR-France, HR-Croatia, HU-Hungary, IE-Ireland, LT-Lithuania, LU-Luxembourg, LV-Latvia, MT-Malta, NL-Netherlands, PL-Poland, PT-Portugal, RO-Romania, SE-Sweden, SI-Slovenia, SK-Slovakia, UK-United Kingdom.

Appendix 2

Overview of environmental taxes and excises in EU

Austria	Excise duty – Energy products
	Duty on vehicles based on fuel consumption
	Motor vehicles tax – Tax 1
	Motor vehicles tax – Tax 2
Belgium	Excise duty – Energy products and electricity
	Motor vehicles tax – Eurovignette
	Motor vehicles tax - tax on traffic circulation
	Motor vehicles tax - Tax on the entry into traffic service
Bulgaria	Excise duty – Energy products
	Motor vehicles tax
Cyprus	Excise duty – Energy products
	Motor vehicles tax
	Motor vehicles tax - Circulation licenses in for public use vehicles
Czech Republic	Excise duty – Energy products
	Motor vehicles tax – Road tax (commercial)
	Road tax - Highway fee
	Levy on electricity from solar radiation
Denmark	Duty on oil pipeline
	Excise duty – Carbon dioxide tax on certain energy products
	Excise duty – Energy products
	Road tax – Road user charge (Eurovignette)
	Motor vehicles tax – Weight tax on motor vehicles

	Motor vehicles tax – Motor vehicle registration duty
	Motor vehicles tax – Green tax on passenger cars
	Tax on pleasure boat insurance
	Tax on third-party insurance for motor vehicles
	Excise duty - Water in pipelines
	Excise duty - Wastewater
	Excise duty – Tax on certain packaging, disposable tableware, etc.
	Excise duty - Sulphur
	Excise duty – Sealed NiCad - batteries
	Excise duty – PVC and phthalates tax
	Excise duty - Pesticides
	Excise duty - Nitrogen
	Excise duty – Duty on antibiotics and growth promoters used in animal feeding stuffs
	Excise duty – CFC, HFC, PFC, and SF6
	Excise duty – certain chlorinated solvents
	Excise duty – Door to door distributed advertising circulars
Estonia	Excise duty – Energy products
	Pollution fee
Finland	Excise duty – Energy products
	Motor vehicles tax – Vehicle tax
	Motor vehicles tax – Car tax
	Waste tax
	Excise duty – Sweets, Ice-cream and Soft drinks
France	Special duty on oils intended for human consumption
	Civil aviation duty
	Motor vehicles tax – Annual tax on company cars
	Pollution tax
	Tax on public air and transport to and from Corsica
	Road tax – Tax payable by motorway operations
	Tax on the removal from of household refuse
Germany	Excise duty – Energy products
	Motor vehicles tax
	Aviation tax
	Nuclear fuel tax
Greece	Excise duty – Energy products
	Motor vehicles tax – Car registration tax
	Motor vehicles tax – Road tax on motor vehicles
Hungary	Excise duty – Energy products
	Motor vehicles tax
Ireland	Motor vehicles tax – Vehicle duties
	Excise duty – Energy products
	Motor vehicles tax- Vehicle registration tax
	Landfill levy
	Plastic bag levy

Italy	Local surcharge on electricity duty
	Regional excise on motor fuel
	Excise duty – Energy products
	Motor vehicles tax
	Registration tax
	Motor vehicles tax – Public motor vehicle register tax
	Tax on emissions of sulphur dioxide (SO ₂) and nitrogen oxides (NO ₂)
	Regional special tax on landfill dumping
	Provincial environmental protection tax
	Municipal tax on waste and services
Latvia	Excise duty – Energy products
	Motor vehicles tax – Annual vehicle duty
	Motor vehicles tax – Car registration tax
	Natural resource tax
	Motor vehicles tax – Company car tax
	Motor vehicles tax – Vehicle use tax
Lithuania	Excise duty – Energy products
	Tax on pollution
	Tax on petroleum and natural gas resources
	Tax on state natural resources
Luksemburg	Excise duty – Energy products
	Motor vehicles tax
Malta	Excise duty – Energy products
	Motor vehicles tax – Motor vehicle registration tax
	Motor vehicles tax – Annual circulation tax
	Eco Contribution
Netherlands	Excise duty – Energy products
	Motor vehicles tax – Tax on heavy motor vehicles
	Motor vehicles tax – Tax on passenger cars and motor bicycles
	Motor vehicles tax
	Tax on tap-water
	Waste tax
	Tax on groundwater
Poland	Excises duty – Energy products, mineral oil, natural gas, electricity
	Motor vehicles tax – Transport vehicles
	Excise duty - Cars
Portugal	Excise duty – Energy products
	Motor vehicles tax – Circulation tax
	Motor vehicles tax
Romania	Motor vehicles tax – Pollution tax
	Motor vehicles tax – Tax on means of transport
	Excise duty – Energy products
	Tax on domestic production of crude oil and natural gas
	Environmental stamp duty

Slovakia	Excise duty – Mineral oil, natural gas, coal, electricity
	Motor vehicles tax
	Taxes for municipal waste and small construction waste
Slovenia	Excise duty – Energy products
	CO ₂ tax
	Motor vehicles tax
	Annual fee on the use of motor vehicles
Spain	Tax on waste pollution
	Excise duty – Energy products
	Motor vehicles tax – Tax on mechanically powered vehicles
Sweden	Motor vehicles tax – Special tax on certain means of transport
	Tax on thermal effect of nuclear power stations
	Excise duty – Energy products
	Excise duty – Carbon dioxide tax
	Motor vehicles tax
	Excise duty – Tax on natural gravel
	Tax on waste
	Tax on pesticides
	Excise duty – Sulphur tax
United Kingdom	Tax on traffic insurance premiums
	Excise duty – Energy products
	Excise duty – Vehicle excise duty
	Climate change levy
	Excise duty – Air passenger duty
	Landfill tax
	Aggregates levy
	Excise duty – Energy products and electricity
Croatia	Motor vehicles tax
	Motor vehicles tax – Special tax on road motor vehicles
	Motor vehicles tax – Special tax on road motor vehicles
	Excise duty – Energy products
	Excise duty – Natural gas
	Excise duty – Solid fuels
	Charges on polluters of the environment
	Charges for the environment users
	Charges for environmental impacts of waste
	Special environmental charge on motor vehicles

Source: European Commission: Taxes in Europe Database.

Appendix 3

Total environmental tax revenues as the percentage of gross domestic product (GDP), 2000-2013

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average 2010-2013
Austria	2.42	2.59	2.63	2.71	2.68	2.59	2.45	2.39	2.37	2.37	2.35	2.43	2.41	2.38	2.48
Belgium	2.39	2.38	2.33	2.38	2.47	2.45	2.26	2.22	2.13	2.18	2.21	2.25	2.14	2.05	2.27
Bulgaria	2.56	2.46	2.29	2.89	3.10	2.95	2.87	3.25	3.35	2.95	2.86	2.76	2.74	2.87	2.85
Cyprus	2.50	2.78	2.73	3.46	3.67	3.23	3.00	3.07	2.89	2.66	2.65	2.66	2.46	2.61	2.88
Czech Republic	2.26	2.34	2.28	2.35	2.43	2.47	2.37	2.31	2.25	2.29	2.27	2.33	2.23	2.12	2.31
Denmark	4.84	4.82	5.00	4.80	4.99	4.92	4.68	4.74	4.18	4.01	4.04	4.05	4.03	4.23	4.52
Estonia	1.70	2.12	1.99	1.89	2.10	2.27	2.17	2.18	2.30	2.92	2.90	2.74	2.75	2.56	2.33
Finland	3.04	2.86	2.96	3.07	3.11	2.96	2.89	2.64	2.58	2.52	2.66	3.00	2.96	2.92	2.87
France	2.16	1.95	2.05	1.97	2.07	2.00	1.95	1.87	1.84	1.87	1.89	1.92	1.94	2.03	1.97
Germany	2.32	2.45	2.45	2.59	2.47	2.40	2.33	2.16	2.13	2.25	2.12	2.16	2.11	2.04	2.28
Greece	2.25	2.45	2.22	2.08	2.07	2.05	1.93	1.99	1.88	1.92	2.46	2.77	2.84	3.03	2.28
Hungary	2.96	2.81	2.75	2.78	2.86	2.76	2.80	2.78	2.69	2.63	2.77	2.65	2.63	2.45	2.74
Ireland	2.76	2.29	2.28	2.28	2.42	2.43	2.41	2.45	2.31	2.29	2.46	2.38	2.35	2.43	2.40
Italy	3.04	3.02	2.93	2.99	2.83	2.89	2.86	2.72	2.56	2.79	2.79	3.05	3.46	3.49	2.96
Latvia	2.27	2.05	2.14	2.27	2.44	2.52	2.23	1.93	1.84	2.29	2.40	2.46	2.42	2.39	2.26
Lithuania	2.46	2.56	2.81	2.79	2.70	2.29	1.80	1.75	1.63	2.02	1.83	1.69	1.65	1.64	2.12
Luxembourg	2.64	2.71	2.69	2.79	3.04	3.00	2.68	2.65	2.63	2.58	2.43	2.40	2.37	2.22	2.63
Malta	3.54	3.48	3.27	3.15	2.84	3.08	3.19	3.57	3.27	3.17	2.91	3.04	2.83	2.69	3.15
Netherlands	3.49	3.40	3.29	3.35	3.48	3.59	3.66	3.43	3.50	3.51	3.53	3.46	3.31	3.35	3.45
Poland	2.14	2.16	2.46	2.51	2.74	2.69	2.66	2.73	2.66	2.53	2.55	2.51	2.49	2.36	2.51
Portugal	2.62	2.85	3.01	2.96	2.96	2.89	2.79	2.75	2.48	2.44	2.43	2.32	2.15	1.84	2.61
Romania	3.27	2.17	1.97	2.22	2.33	1.98	1.92	2.04	1.74	1.84	1.97	1.80	1.90	1.95	2.09
Slovakia	2.19	1.93	2.15	2.39	2.45	2.34	2.23	2.07	2.01	1.92	1.83	1.82	1.72	1.72	2.06
Slovenia	2.88	3.17	3.19	3.23	2.4	3.15	2.96	2.95	2.95	3.49	3.56	3.38	3.74	3.87	3.27
Spain	2.14	2.03	2.03	2.00	1.96	1.90	1.83	1.77	1.63	1.61	1.63	1.57	1.55	1.83	1.82
Sweden	2.66	2.67	2.74	2.75	2.69	2.72	2.61	2.52	2.57	2.68	2.59	2.41	2.40	2.36	2.60
United Kingdom	2.85	2.66	2.61	2.55	2.51	2.37	2.29	2.35	2.34	2.48	2.52	2.48	2.50	2.51	2.50
Croatia	:	:	4.08	4.13	3.99	3.85	3.77	3.67	3.4	3.33	3.63	3.28	3.16	3.45	3.12
EU 28	:	:	2.56	2.57	2.55	2.50	2.43	2.35	2.29	2.36	2.36	2.40	2.42	2.44	2.09

Source: Eurostat. Environmental tax revenues.

Appendix 4

Total environmental tax revenues as the percentage of total revenues from taxes and social contributions, 2000-2013

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013 estimate
Austria	5.76	5.92	6.20	6.39	6.41	6.36	6.07	5.90	5.73	5.79	5.75	5.94	5.78	5.57
Belgium	5.42	5.40	5.27	5.45	5.65	5.62	5.23	5.19	4.94	5.15	5.17	5.23	4.87	4.28
Bulgaria	8.42	8.25	8.21	9.51	9.76	9.58	9.46	10.11	10.69	10.49	10.6	10.54	10.11	10.21
Cyprus	9.02	9.74	9.58	11.76	12.21	10.11	9.21	8.40	8.19	8.23	8.17	8.22	7.63	8.24
Czech Republic	7.00	7.25	6.86	6.90	7.07	7.24	7.03	6.73	6.83	7.14	7.04	7.09	6.69	6.09
Denmark	10.05	10.21	10.73	10.26	10.45	9.94	9.72	9.94	8.97	8.65	8.71	8.69	8.55	8.71
Estonia	5.48	7.00	6.42	6.14	6.89	7.45	7.15	7.01	7.34	8.37	8.74	8.58	8.56	8.03
Finland	6.64	6.64	6.84	7.24	7.44	7.03	6.88	6.39	6.27	6.17	6.55	7.16	6.96	6.63
France	5.04	4.60	4.88	4.71	4.93	4.71	4.55	4.43	4.40	4.56	4.58	4.53	4.44	4.47
Germany	5.8	6.44	6.52	6.82	6.67	6.47	6.24	5.77	5.67	5.91	5.77	5.80	5.56	5.31
Greece	6.76	7.66	6.83	6.73	6.89	6.56	6.34	6.38	6.08	6.45	7.93	8.52	8.45	:
Hungary	7.56	7.37	7.33	7.41	7.68	7.48	7.62	7.00	6.76	6.70	7.39	7.19	6.83	6.37
Ireland	8.94	7.97	8.32	8.14	8.31	8.25	7.77	8.07	8.10	8.45	9.16	8.87	8.63	8.47
Italy	7.59	7.59	7.47	7.55	7.28	7.50	7.12	6.59	6.22	6.73	6.79	7.45	8.16	8.1
Latvia	7.72	7.20	7.73	8.37	9.00	9.16	7.88	6.79	6.71	8.73	8.79	8.92	8.64	8.59
Lithuania	7.95	8.72	9.68	9.68	9.33	7.88	6.00	5.84	5.36	6.71	6.49	6.22	6.12	6.07
Luxembourg	7.10	7.10	7.05	7.30	8.18	7.85	7.33	7.14	7.04	6.58	6.39	6.39	6.16	5.63
Malta	13.01	12.17	11.09	10.73	9.45	9.75	10.00	10.86	10.18	9.78	9.34	9.55	8.86	8.18
Netherlands	9.39	9.44	9.26	9.50	9.83	10.06	9.96	9.43	9.54	9.90	9.76	9.62	9.06	9.00
Poland	6.60	6.73	7.54	7.80	8.73	8.20	7.92	7.92	7.75	8.05	8.15	7.90	7.76	7.42
Portugal	8.50	9.35	9.72	9.54	9.90	9.47	8.96	8.68	7.86	8.19	8.01	7.19	6.83	5.43
Romania	10.87	7.61	7.03	8.07	8.62	7.17	6.77	7.07	6.33	6.97	7.50	6.77	6.83	7.14
Slovakia	6.53	5.90	6.61	7.42	7.94	7.63	7.79	7.23	7.03	6.80	6.65	6.47	6.18	:
Slovenia	7.87	8.62	8.59	8.65	8.67	8.29	7.86	7.97	8.06	9.57	9.64	9.26	10.15	10.46
Spain	6.43	6.21	6.10	6.06	5.76	5.42	5.08	4.89	5.07	5.39	5.24	5.07	4.88	5.65
Sweden	5.42	5.71	6.07	6.06	5.89	5.85	5.69	5.61	5.84	6.10	6.02	5.69	5.67	5.29
United Kingdom	8.15	7.60	7.77	7.68	7.46	6.97	6.58	6.83	6.54	7.57	7.54	7.31	7.45	7.24
Croatia	:	:	10.89	11.17	11.01	10.66	10.27	9.93	9.27	9.20	10.11	9.37	8.86	9.50
EU- 28	:	:	6.76	6.81	6.77	6.59	6.33	6.14	6.00	6.32	6.34	6.35	6.31	:

Source: Eurostat. Environmental tax revenues.

Appendix 5

Total environmental tax revenue, EU-28, in billion EUR and %, 2002–2012

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013(estimate)
Energy taxes	203.7	209.3	214.6	217.5	221.5	224.0	220.0	218.9	229.5	240.0	248.2	253.1
Taxes on Pollution/Resources	9.2	9.3	9.5	9.7	10.4	10.9	11.2	10.2	10.7	11.1	11.7	11.3
Transport taxes	50.8	51.5	57.0	60.4	63.7	68.7	65.9	59.8	62.1	64.6	65.5	65.9
Total environmental taxes	263.7	270.1	281.2	287.6	295.6	303.7	297.1	288.9	302.3	315.7	325.4	330.3
Percentage of gross domestic product (GDP)	2.56	2.57	2.55	2.5	2.43	2.35	2.29	2.36	2.36	2.4	2.42	2.44
Percentage of total revenues from taxes and social contributions	6.76	6.81	6.77	6.59	6.33	6.14	6	6.32	6.34	6.35	6.31	-

Source: Eurostat. Environmental tax revenues.

Appendix 6

Rates of special tax according to the value of a vehicle in Croatia

Tax base, in HRK	Rate (%)
0.00 – 100,000.00	1
100,000.01 – 150,000.00	2
150,000.01 – 200,000.00	4
200,000.01 – 250,000.00	6
250,000.01- 300,000.00	7
300,000.01 – 350,000.00	8
350,000.01 – 400,000.00	9
400,000.01 – 450,000.00	11
450,000.01 – 500,000.00	12
500,000.01 - and above	14

Source: Act on Special tax on motor vehicles (Official Gazette, 15/13 and 108/13)

Rates of special tax for vehicles that use diesel, petrol, liquefied propane gas and diesel fuel with exhaust gas emissions EURO VI Standard

Diesel		Petrol, liquefied propane gas, natural gas, and diesel fuel with exhaust gas emissions EURO VI	
CO ₂ emission (g/km)	Rate (%)	CO ₂ emission (g/km)	Rate (%)
86-100	1.5	91-100	1
101-110	2.5	101-110	2
111-120	3.5	111-120	3
121-130	7	121-130	6
131-140	11.5	131-140	10
141-160	16	141-160	14
161-180	18	161-180	16
181-200	20	181-200	18
201-225	23	201-225	21
226-250	27	226-250	23
251-300	29	251-300	27
301 – and above	31	301 – and above	29

Source: Act on Special tax on motor vehicles (Official Gazette, 15/13 and 108/13)

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KOMPARATIVNA ANALIZA EKOLOŠKIH POREZA U EU I HRVATSKOJ

Sažetak

Kako bi što učinkovitije štitile okoliš, pojedine se države između ostaloga koriste i različitim fiskalnim i parafiskalnim instrumentima koji mogu biti i financijski izdašni. Jedan od tih instrumenata su i ekološki porezi koji imaju pozitivan utjecaj na okoliš. Cilj je ovog rada analizirati vrste, važnost i financijski učinak ekoloških poreza u EU i Hrvatskoj. Analiza prosječnih udjela prihoda od ekoloških poreza u bruto društvenom proizvodu pokazala je da su u razdoblju od 2000. do 2013. najveći prosječni udio imale Danska (4,52%) i Nizozemska (3,45%), a najmanji udio zabilježen je u Francuskoj (1,97%) i Španjolskoj (1,82%). U Hrvatskoj od fiskalnih instrumenata postoji osam različitih vrsta ekoloških poreza i naknada, čiji su ukupni prihodi u državnom proračunu u 2013. iznosili 3,45% bruto društvenog proizvoda. U razdoblju 2008. – 2012. proračuni Republike Hrvatske najviše su poreznih prihoda prikupili od poreza na energente, dok su porezi na prirodne resurse u iznosima zanemarivi.

Ključne riječi: ekonomski instrumenti, zaštita okoliša, ekološki porezi, EU, Hrvatska.

JEL klasifikacija: H23, Q58

